An Investigation of the Malaysian Palm Oil Industry's Environmental Strategies, Stakeholders' Pressure, Environmental Effectiveness and Competitive Advantage

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Declaration

I hereby certify that the work embodied in this thesis is the result of the original research and has not been submitted for a higher degree to any other University or Institution.

*(Signed)*_____

Dedications

To my late father (May Allah be Merciful upon Him)

Yaacob Bin Saman who inspired my pursuit of knowledge, and also to

my beloved mother for her continuous support and prayer for my success.

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List of Acronyms

ACCA	Association of Chartered Certified Accountants
BCSC	Business Council for Sustainable Development
BOD	Biochemical Oxygen Demand
CAC	Command and Control
DOE	Department of Environment
BRIMAS	Borneo Resources Institute
CAP	Consumer's Association of Penang
CER	Corporate Environmental Reporting
CPO	Crude Palm Oil
DAFMS	Department of Agriculture of the Federated Malay States
DG	Director General
EFB	Empty Fruit Bunches
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EMT	Ecological Modernisation Theory
ENGOs	Environmental Non Governmental Organizations
EPSM	Environment Protection Society of Malaysia
EQA	Environmental Quality Act
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FELCRA	Federal Land Consolidation and Rehabilitation Authority
FELDA	Federal Land Development Authority
FFA	Free Fatty Acid
FFB	Fresh Fruit Bunches
FME	Free Market Environmentalism
FMM	Federation of Malaysian Manufacturers
FoE	Friends of the Earth
FSC	Forest Stewardship Council
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
GPF	Green Project Facility
HCVF	High Conservation Value Forest
IPM	Integrated Pest Management
ISA	Internal Security Act

KLSE	Kuala Lumpur Stock Exchange
LCA	Life Cycle Assessment
MBI	Market Based Instrument
MENGOs	Malaysian Environmental Non Governmental Organisations
MNCs	Multi National Corporations
MNS	Malaysian Nature Society
MPOA	Malaysian Palm Oil Association
MPOB	Malaysian Palm Oil Board
MPOI	Malaysian Palm Oil Industry
MPOPC	Malaysian Palm Oil Promotional Council
NAFTA	North American Free Trade Agreement
NEPA	National Environmental Protection Agency
NGOs	Non Governmental Organisations
NCLs	Native Customary Lands
NEP	New Economic Policy
NME	Neo-classical Market Economy
NREB	Natural Resources and Environment Board
OECD	Organisation for Economic Co-operation and Development
POME	Palm Oil Mill Effluent
PORIM	Palm Oil Research Institute of Malaysia
PORLA	Palm Oil Regulation and Licensing Authority
PPP	Polluter Pays Principle
RISDA	Rubber Industry Smallholders Development Authority
RSPO	Roundtable on Sustainable Palm Oil
SAM	Sahabat Alam Malaysia
SD	Sustainable Development
SMEs	Small and Medium Enterprises
SRI	Socially Responsible Investment
TQEM	Total Quality Environmental Management
UNCED	United Nation Conference on Economic Development and Environment
UNEP	United Nations Environment Programme
WCED	World Commission on Environment and Development
WWF	World Wide Fund for Nature

Abstract

Over the last three decades there has been increasing pressure from stakeholders on businesses to be environmentally responsible. Business organisations cannot help but take this consideration seriously because it has a far-reaching impact on their very survival. This research is intended to bring insights into how and why a business's management responds to environmental pressure from stakeholders. How a business responds to its stakeholders is known as environmental strategy. In addition, this study also investigates how proactiveness in implementation of each type of environmental strategy impacts on a business's environmental effectiveness and competitive advantage.

In Malaysia palm oil is the most important agricultural commodity in the country, and contributes substantially to the economy. Unfortunately, its activities are not without environmental costs. Deforestation, depletion of flora and fauna, excessive use of chemicals, air and water pollution are the results of the industry's activity. But due to stakeholders' pressures, the industry has embraced environmental management in its activities, albeit at a slow pace. Against this background, this study seeks to investigate the efficacy of corporate environmentalism, using a number of palm oil companies as case studies. This study is paramount as no such study has previously been conducted in Malaysia. The Malaysian palm oil industry offers an interesting case for studying corporate environmentalism in developing countries. Using a mixed-methods or triangulation of analysis of nine palm oil companies, which are listed on the Kuala Lumpur Stock Exchange, as case studies, this research investigates the environmental practices of the palm oil companies, and the relationship of these practices with stakeholders' pressures, environmental effectiveness and competitive advantages.

The results of the study reveal that three levels of overall environmental strategy are adopted by the participating palm oil companies. They are labelled by the researcher as *minimalists* - four companies; *intermediators* - two companies; and *proactivists* - three companies. The minimalists refer to companies that exercised the lowest environmental strategy, while the proactivists are those who exercised the highest environmental strategy. The intermediators are in the middle, that is, those companies that seem to be in the early stage of becoming proactivists, but have yet to achieve such a level. The proactivists were classified as those who exercised a proactive strategy, but both intermediators and minimalists exercised a reactive environmental strategy.

In terms of the relationship between environmental proactiveness and stakeholders' pressure it was found that the management of the more proactive companies tended to perceive a wider range of threats from environmental stakeholders compared with reactive companies. Apart from regulatory stakeholders, they also perceived pressure from primary stakeholders, especially their top management, as well as secondary stakeholders including ENGOs, competitors, and the media. On the contrary, reactive companies only perceived threats from regulatory stakeholders. Not only did proactivists differ in terms of stakeholders' pressure, they were at the same time perceived to be more environmentally effective and to gain more competitive advantages than less proactive companies. Based on the research findings it seems there is a significant positive correlation between a proactive environmental strategy and both environmental effectiveness and competitive advantage among Malaysian palm oil companies.

In this study measurement of the environmental strategies and environmental effectiveness was solely based on a triangulation of surveys (seven-point scale items) and in-depth interviews. In order to increase the validity of the study, future researchers need to triangulate these data with other quantitative data. For instance, at a company level, a company's resources can be measured based on its financial statistics such as sales, net profit, return on investment, and the amount spend on research and development. Moreover, the environmental effectiveness of a mill can be measured in terms of monthly data of biochemical oxygen demand (BOD), of palm oil mill effluents and Ringelmann Chart of air emissions, and the amount of money expended on de-sludging for certain periods of time. In both plantations and mills, future researchers can gather data related to environmental accidents, fines and court cases.

The key findings of this research are instructive. The majority of the participating palm oil companies in Malaysia adopted reactive environmental strategies. Only a few adopted proactive environmental strategies, and they were more likely to exercise environmental practices at strategic and tactical levels such as top management involvement in environmental issues as well as deploying environmental management systems which mostly related to the bottom line of their businesses. Serious attention towards the destruction of the tropical rainforest as a result of their activities is lacking among participating companies.

Chapter One

Introduction

1.1 Background: The Environmental Issues

Since the 1960s ecological issues have gained more attention as a result of an increasing awareness among various stakeholders of the negative impact of environmentally unfriendly business activities. The environmental crises, like global warming, the green house effect and deforestation, pose a major threat to human survival. At present, environmental degradation is no longer a local issue, the damage being inflicted on human health and ecosystems has forced international communities to find solutions to reduce the impact. A comprehensive approach to global development was first expressed in the Brundtland Commission report in 1987 through the goal of 'sustainable development' (henceforth SD). The concept of SD as widely quoted is defined as 'the ability of current generations to meet their needs without compromising the ability of future generations to meet theirs' (WCED, 1987 p.8). Creating a sustainable economy is one strategy to achieve SD. The Brundtland report, 1987 and the outcomes of the Rio Summit, 1992, are considered by many as wake-up calls for businesses to integrate environmental issues into their corporate agendas. It makes good business sense as well, since environmentally friendly businesses in turn will be expected to enjoy competitive advantage in terms of improved product quality, increased staff commitment, improved materials efficiency, positive pressure group relations, improved media coverage, assured present and future compliance, ethical image and improved staff commitment.

There are a number of studies on environmental management in business fields, nevertheless Hart's study (1997) provides a background to this research. In his article in the *Harvard Business Review* entitled, 'Beyond greening: Strategies for a sustainable world', he identified that the world's market economy comprises three main regions: developed, emerging and survival economies. He argued that despite the intense use of energy and materials in the developed countries, levels of pollution are relatively low due to stringent environmental regulations, the greening of industry, and relocation of the most polluting activities. On the contrary, the onslaught of development through a rapid industrialisation, which focuses more on commodities and manufacturing,

presents enormous environmental challenges in the emerging economy. Hart believed a sustainable world would only be achieved if the emerging economies worked hand in hand with the developed countries to cope with the issue. At present the emerging economies are lagging behind, obviously believing that any environmental conservation activities to address environmental degradations exacerbated by their activities would put a brake on their development.

In this respect, enormous challenges lie ahead of the emerging economies. Malaysia, as one of them, has achieved high economic growth over the past two decades. Palm oil is the most important agricultural commodity in the country and contributes substantially to the economy. Unfortunately, its activities are not without environmental costs. As with other extractive industries such as logging, rubber, tin and chemical-based agriculture, the Malaysian palm oil industry (henceforth MPOI) is considered as an environmentally damaging activity in the country (Wong, 1998 p.2). Deforestation, depletion of flora and fauna, excessive use of chemicals, air and water pollution are the results of the industry's activity. But due to stakeholders' pressure, the industry has embraced environmental management in its activities, albeit at a slow pace. Among these stakeholders, environmental regulators appear to be the main force applying pressure on corporate environmentalism in the industry. Many environmental strategies within the industry have been adopted to comply with the environmental legislation. Overall, it is correct to say that the MPOI seems to adopt a reactive environmental strategy instead of a proactive strategy in dealing with environmental issues.

1.2 The Problem Statement

In the 1960s, when rubber prices began a prolonged decline, the Malaysian government began encouraging palm oil production. With very fast growth rates of the industry, Malaysia soon became the world's largest producer of palm oil, and accounted for more than half of the world production of crude palm oil and three-quarters of the world's exports of crude palm oil. But nevertheless, the success of the Malaysian government in gaining economic growth through the industry has had an adverse affect on the natural environment. By 1975, palm oil mills became the country's worst source of water pollution. According to the Department of Environment (henceforth DOE), the highest Biochemical Oxygen Demand (BOD) load emitted by palm oil mills throughout

Malaysia was in 1978, where 563 tons per day were discharged into rivers. This figure was equivalent to the pollution generated by a population of more than 16 million, which far surpassed the Malaysian population at that time of 11 million (DOE, 1987).

To address the problem, in July 1977 the DOE announced the Environmental Quality (Prescribed Premises) (Crude-Palm Oil) Regulations, 1977, whereby the mills needed to apply for an operating licence every year from the DOE. Due to the enforcement action taken by this authority, a significant improvement was achieved by the mills. The mills drastically reduced their pollution to comply with the regulations in order to avoid their licences being suspended. For instance, in 1981 the total BOD loads discharged was 58 tons per day and in 1991 the loads reduced dramatically to 6 tons per day. The compliance rate of palm oil mills in the first decade of the implementation of the regulation was impressive and the average compliance rate was up to 75 per cent (DOE, 1991). Although some progress has been noted, the performance records on the whole show that despite the promulgation of the laws over the last three decades the issue has remained unresolved. For example, from 1991 to 1998 only 80 per cent of the mills complied with the regulations (DOE, 1998). Here and there, palm oil mills flouting the environmental regulations have been reported in the media. In 1997, the DOE suspended the licences of two palm oil mills for not complying with effluent discharge limits as stipulated in their licences. The DOE also took 27 palm oil mill operators to court for the same offence (Tan, 1999). Recently, in 2005, three palm oil mills in Sabah were each fined RM20,000 or two months' jail by the Sessions Court for disposing of effluent exceeding the permitted level, violating the Environmental Quality (Prescribed Premises) (Crude-Palm Oil) Regulations, 1977 (*Daily Express News*, 12 May 2005).

Another significant consequence of the MPOI is forest depletion. It is interesting to note that in 1966, a decade after independence, close to 70 percent of Peninsular Malaysia was still under forest (Ooi, 1976 p.89). However, since that time oil palm monoculture crops have reduced forest areas dramatically. According to Cho (1990 p.106), between 1966 and 1978 the areas of primary forest on the Peninsula decreased by 15 per cent; depletion of rainforest ensued in the 1980s. It was reported that annual rates of tropical deforestation in Malaysia from 1981 to 1985 and 1989 were 250.5 km^2 and 480 km^2 respectively, and Malaysia was one of the countries experiencing fastest deforestation in the world (Aiken & Leigh, 1992 p.11). As a result in 1990 only about 42 per cent of

forest was left in Peninsular Malaysia (Aiken & Leigh, 1992 p.69). The onslaught of development of the MPOI on the environment continued in the 1990s and early 2000s. With suitable lands no longer available in Peninsular Malaysia, palm oil companies moved to Sarawak and Sabah (East Malaysia). In Sarawak, it was estimated that the recent acceleration of oil palm development has resulted in the loss of 5 to10 per cent of forest (Jomo, Phang, Khoo, 2004 p.178). In Sabah, the natural forests fell from 68 per cent in 1981 to about 60 per cent by 2000 (McMorrow & Talip, 2001 p.222). Overall, from 1995 to 2000, about 86 per cent of all deforestation in Malaysia was attributed to the MPOI alone (Simeh & Ahmad, 2001).

On closer inspection of the expansion of the MPOI since independence, it is clear that the growth of the industry has been at the expense of Malaysian rainforests. In other words the industry has become the major cause of deforestation. Clearly, the increased yield of palm oil in Malaysia has been largely enabled by clearing areas of forests for oil palms instead of efficiently managing the existing areas *per se*. The lesson to be learned from the above findings is that the best possible option to increase the country's oil palm output is through the enhancement of palm oil yield by utilising advances in planting materials and practices, rather than by expanding oil palm plantations into the rain forests.

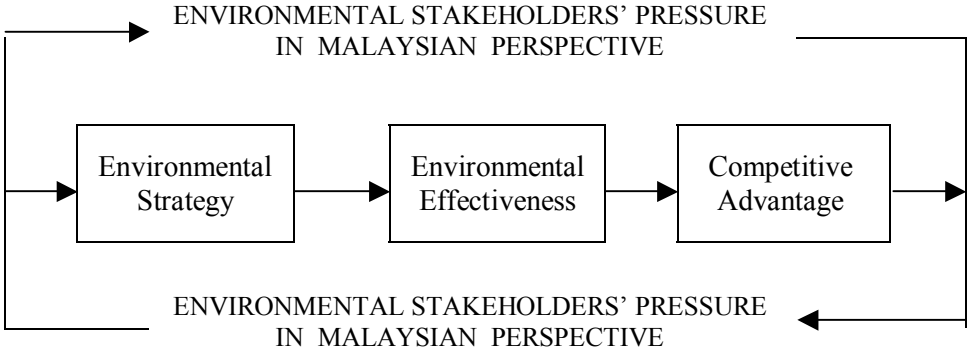
1.3 The Research Questions

Against this background, this study seeks to investigate the efficacy of corporate environmentalism, using a number of palm oil companies as case studies. The problem identified in this study is how to make the MPOI more environmentally sustainable? A number of research questions will be asked to assist this research: (i) What types of environmental strategies have the MPOI adopted? (ii) How and to what extent does the management of each strategy proactiveness group respond to environmental stakeholders' pressures? (iii) Is there any difference in the effectiveness of the various environmental strategies adopted by the MPOI? (iv) Is there any difference in the level of competitive advantage of the various environmental strategies adopted by the MPOI? (v) Do size and resources of the companies determine the level of environmental strategies? and (vi) What environmental strategies should the MPOI adopt to be more environmentally responsible?

1.4 The Research Framework

Figure 1.1 shows the relationship between environmental stakeholders' pressures, environmental strategies, environmental effectiveness and competitive advantage.

Figure 1.1: ***Relationship between Stakeholders' Pressure, Environmental Effectiveness and Competitive Advantage***



Adapted from: Shrivastava, (1995a) Figure 1, page 189. "Environmental Technologies and Competitive Advantage". *Strategic Management Journal*, 16.

1.4.1 Environmental Stakeholders

Environmental stakeholders are impinging on the business and its management. Typical pressures are expected to come from government legislations, environmental non-governmental organisation (ENGOs), local community, employees, financial institutions, insurance companies, shareholders, business associations and distributors. These stakeholders, consequently, will have an influence on the business's environmental strategies. This research will track the business's reaction to these pressures. The efficacy of a business' environmental strategy on environmental effectiveness and competitive advantage will also be investigated.

1.4.2 Environmental Strategies

Simply put, environmental strategies can be defined as the planned and intended course of action taken by a firm to respond to environmental pressure related to the natural environment. Examples of environmental strategies a company might engage in include

having an environmental plan, reducing energy usage, sourcing environmentally friendly products/materials, recycling and minimising or preventing pollution.

1.4.3 Environmental Effectiveness

As a result of pressures from stakeholders, demands on the company to measure, document and disclose information about environmental performance will become more pervasive. Judge and Douglas (1998 p.245) define environmental performance as 'a firm's effectiveness in meeting and exceeding society's expectations with respect to concerns for the natural environment.' A company's environmental compliance, level of investment in new technology, operational costs, level of complaints, environmental accidents, environmental management systems, relationship with stakeholders and public environmental disclosure are typical measures of environmental effectiveness.

1.4.4 Competitive Advantage

In general, competitive advantage occurs when a firm implements a value-creating strategy which other companies are unable to duplicate. By addressing environmental concerns, businesses may differentiate and distance themselves from competitors, improve financial performance and enhance company reputation.

1.5 The Contributions of the Study

The contributions of this study are as follows:

- This study contributes to knowledge in the area of corporate environmentalism and stakeholderism by harnessing neo-classical market economy, ecological modernisation theory and stakeholder theory. As such, it contributes to a better understanding of how management perceives the stakeholders' pressure in relation to environmental issues and how the MPOI responds to the pressures in the context of a developing country. This study is paramount as no such study has previously been conducted in Malaysia.
- This study contributes to the industry, as it provides suggestions on how to develop a more viable strategy to address environmental issues and corporate

sustainability.

- The investigation of environmental strategies in the MPOI will assist Malaysian policy makers and regulatory authorities in choosing suitable courses of action to address environmental issues in the Malaysian palm oil industry.
- This study has strategic implications for the MPOI as environmentally benign practices can be used for competitive advantage to compete in the international market. An increasing number of environmentally conscious customers provide a niche market to the industry.

1.6 The Research Approach

This research involves multiple case studies where a number of publicly listed palm oil companies were investigated to study their corporate environmentalism. Data of these multiple case studies came from 'triangulation' of two main sources of evidence: quantitative survey and in-depth interviews. Such a triangulation is known as 'methodological triangulation' where mixed methods (quantitative and qualitative) were used to gain the most complete and detailed data possible on the phenomenon under investigation. Both types of data are necessary as supplements and as mutual verification for one another. In addition, a combination of these paradigms in a single piece of research compensates for the weakness of each by the counter-balancing the strengths of both approaches. It is assumed that multiple and independent measures do not share the same weaknesses or potential for bias. Increasingly, authors and researchers who work in organizations, and with managers, argue that one should attempt to mix methods to some extent, because it provides more perspectives on the phenomena being investigated (Dodge, 1995; Sharma & Vredenburg, 1998).

The quantitative research methodologies make use of questionnaires and statistical analyses in order to establish underlying patterns and commonalities between surveyed groups to improve understanding of variable relationships. In this research, four key persons from various managerial levels in each company involved in the investigation. The quantitative data for this research were formulated through a survey utilising a structured questionnaire administered by the researcher. This is deemed appropriate because the researcher is available on-site to explain about the questions in the research questionnaire. Moreover, this technique would ensure a higher participation from

respondents. A seven-point scale was used in the questionnaire and respondents chose the most appropriate answers.

Although quantitative data analysis can be used to establish whether differences in terms of stakeholders pressure, environmental effectiveness, and competitive advantage exist or not among environmental strategies, it does not fully answer the question of how and why regarding the phenomena under investigation. For example, in quantitative data analysis the researcher can measure what type of environmental strategy is adopted by a palm oil company and which environmental stakeholders its management perceives as threats, but the quantitative method does not answer the question of how and why such a particular stakeholder is considered as a threat. Such questions reveal the influence of a particular stakeholder on a palm oil company and how it uses it against the company. This is why qualitative research methodologies are deemed helpful to deal with the weaknesses of quantitative method.

The qualitative research methodologies use an in-depth interview, which proceed after the survey. The interview took approximately one to two hours. An interview protocol that contains semi-structured questions were used to facilitate this exercise. Since this study is a multiple case study design - involved different companies and various managerial levels of participants, the interview protocol was prepared to ensure the consistency of the interviews. The interviews would be audio-taped, subject to interviewees' consents.

They are two main participants groups in this research project. The first group is from the MPOI itself and the second group consist of organisations which are stakeholders in the industry. In each palm oil company, four individuals consisting of (i) chief executive officer (CEO) or general manager, (ii) plantation manager, (iii) palm oil mill manager and (iv) environmental officer or senior engineer were interviewed. They are chosen because they are able to make important decisions and have strategic views of their organisations. Justification for selecting participants from different locations and departments are: first, the researcher assumes that a plurality of environmental views exists within the organisation; and second, it enables a more detailed investigation into the practice of environmental strategies. This is especially true for a semi-structured interview where interviews allow in-depth inquiry of particular topics. For example,

palm oil mills managers elaborate on more details of their environmental strategies at their mill than general managers because they are the ones who responsible for their mill's operations**.** Similarly, plantation managers who are involved in the day to day running of their plantations have some knowledge about their plantation's practices and represent an accurate view about oil palm plantations. Since this study is not a study of lower level employees' perceptions of environmental strategy, none of them would be involved in the research project.

Additionally, to get a rounded view of the industry corporate environmentalism, some organisations that have a 'stake' in the MPOI were approached. In this respect, important individuals in environmental non-governmental organisations (hereafter ENGOs), media (newspaper companies), DOE, Malaysian Palm Oil Board (MPOB), and Malaysian Palm Oil Association (MPOA) were interviewed. This interview involve a senior staff member of each organisation. There were two levels of questions in the interview. First, general questions about environmental issues in Malaysia, and second, specific questions about their organisation's perceptions of corporate environmentalism in the MPOI and how these stakeholders exert their pressures on the MPOI to be environmentally responsible. As with the MPOI's respondents, only senior staff of each organisation were interviewed. They were chosen because they are knowledgeable enough about their organisations' strategies and possess wide experiences of the environmental issues in Malaysia in general and the MPOI in particular.

1.7 The Limitations of the study

The research focuses on the environmental strategies of the private palm oil companies that are listed under the Kuala Lumpur Stock Exchange (KLSE). Small growers and government-scheme oil palm players will not be involved in the study. The research of these specific palm oil companies' cases is not intended to be an exhaustive review of the Malaysian palm oil industry's environmental strategies, and all of the environmental stakeholders' pressure impinging on the industry. The main aim of the research is to explain how palm oil companies respond (i.e. the types of environmental strategies that are adopted by palm oil companies) and why these palm oil companies perceive some stakeholders imposing pressure on their activities. At the same time, what

environmental effectiveness and competitive advantages managements of palm oil companies observed as a result of their environmental strategies were also investigated.

1.8 Report Organisation

This thesis is organised into ten chapters. Chapter Two contains the literature review of environmentalism and stakeholderism. Chapter Three includes the literature review of environmental strategies. Chapter Four contains the development of the MPOI and the environment. Chapter Five highlights the contemporary MPOI and the environment after 1990. Chapter Six details the methodology of quantitative and qualitative research for this project. Chapter Seven presents the quantitative analysis and hypothesis testing. Chapter Eight presents qualitative analysis and findings in relation to palm oil companies. Chapter Nine looks at the qualitative analysis and findings in relation to selected palm oil industry stakeholders, and the consolidation of quantitative and qualitative data. Chapter Ten presents discussion, conclusions and recommendations.

1.9 Summary

The research develops a more comprehensive understanding of how and why the MPOI responds to environmental stakeholders' pressure and the effect of their environmental strategies on their environmental effectiveness and competitive advantage. This study will focus on four main areas: (i) Environmental Strategies; (ii) Stakeholders' environmental pressure; (iii) Environmental Effectiveness; and (iv) Competitive Advantages. The palm oil companies adopt various environmental strategies as a result of stakeholders' pressure. A number of research questions will be asked to assist this research: How, and to what extent, does management of each strategy take account of the environmental stakeholder pressures? Are there are any differences in environmental effectiveness and competitive advantages observed among various environmental strategies adopted by palm oil companies? and if so what are these differences? Do size and resources affect the relationship between stakeholders' pressure and environmental strategy?

Chapter Two

Literature Review - Environmentalism and Stakeholderism

2.1 Introduction

Chapter One introduced the research. This chapter reviews relevant literature on corporate environmental management. There are three main parts of this chapter. The first part discusses environmentalism and the issue of ecology in the 1960s to 1990s. The second part looks at the concept of sustainable development (SD) as well as some points of criticism. This is followed by the two approaches to achieving sustainability - the neoclassical market economy and the ecological modernisation theory. Criticisms and studies of the applications of the approaches in developed and developing countries will be also discussed. The third part discusses business and environmental issues, the stakeholder theory, how stakeholders use their power against businesses, as well as how each stakeholder exerts influence on businesses to be more environmentally responsible. As with previous parts, studies of stakeholders' pressure on both developed and undeveloped countries will also be discussed.

2.2 Environmentalism and the Issue of Ecology

Public attitudes towards the issue of the ecological impact of economic activities have changed substantially in the last half of the last century.

2.2.1 The 1960s and 1970s

Although concern for ecological issues predates the twentieth century, the 1960s have been marked as the beginning of widespread public concern over environmental issues in developed countries (Eckersley, 1992 p.8; Sandbach, 1980 p.1). Rachel Carson's book *Silent Spring* was probably the first work by a scientist to seriously question the inevitability of progress by human technology impacting on the natural environment (Carson, 1962). In her study Carson found that well-intentioned agricultural practices presented negative environmental consequences for bird populations. The publication of the book gave rise to an environmental movement (Sachs, 1993 p.9), which inspired environmental consciousness of the manufacture and use of toxic substances on a global scale at that time (Hutchinson & Hutchinson, 1996 p.51).

Garrett Hardin's essay *The Tragedy of Commons* warned of the ecological crisis due to freedom of the unregulated commons (Hardin, 1968). Hardin's well-known parable of the medieval herdsmen overstocking the commons vividly demonstrated the tragic dynamic that ensued when people were motivated by an economic rationality. He argued that when people acted according to such thinking, they would inevitably despoil the commons, even when they had full knowledge of the mounting public cost that pursuit of private gain would bring (Eckersley, 1992 p.14).

Later, in 1972, the publication of a report for the Club of Rome, *Limits to Growth* by a group of experts from the Massachusetts Institute of Technology (MIT) presented the likely effects of a continuation of the existing economic and social organisations on nature and mankind (Meadows, Meadows, Randers, & Behrens, 1972). Using extrapolation of computer statistics of five major trends of global concern: industrialisation; population growth; widespread malnutrition; depletion of non-renewable resources, and a deteriorating environment (Meadows *et al*., 1972 p.21), the report warned that if the trend in economic growth continued, there would be a world-wide scarcity of resources. Even if new discoveries or advances in technology doubled the amount of resources, the model showed that soon the resources would be depleted. It proposed the establishment of an equilibrium state, characterised by a world-system that was both sustainable and capable of satisfying the basic material requirements (Meadows *et al*., 1972 p.158). This involves policies like birth control, reduction of resource consumption, economic preferences which are shifted toward services, reduction of industrial pollution, emphasis on capitalised agriculture, and the placing of high value on producing sufficient food for all people (Meadows *et al*., 1972 p.164).

In the same year, the publication of *A Blueprint for Survival* (Goldsmith *et al*., 1972), outlining the lack of sustainability of an unlimited expansion of human numbers and per capita consumption of natural resources echoed many of the same concerns. It called for a stable society[1] characterised by: (i) a minimum disruption of ecology; (ii) maximum materials and energy conservation; (iii) a population where recruitment equals loss; and (iv) a social system where the individual can enjoy the first three conditions.

[1] Is defined as one that to all intents and purposes can be sustained indefinitely while giving optimum satisfaction to its members (Goldsmith *et al*., 1972 p.30)

Both works (*Limits to Growth* & *A Blueprint for Survival*) showed many similarities in the slate of recommendations that they offered. The former advocated a more gradualist approach, emphasising technical changes and organisational control to contain the ecological crises. The latter called for the formation of a radically new world order that was characterised by decentralisation, self-sufficiency and self-government.

The dire projections of these so-called 'doomsday' reports had a significant impact on the world's media and prompted calls for a swift and multifaceted response from national governments (Eckersley, 1992 p.12-13). With the aid of public news media and compounded by the earlier environmental image raising impact of the United Nation Conference on Economic Development and Environment (UNCED), 1972 in Stockholm, environmentalism in industrialised countries grew to become a political force that could not be ignored by mainstream politics. The conference provided the first major international opportunity for the South to highlight the links between the prevailing international economic system, environmental degradation and poverty. Nevertheless, there was a lack of consensus between North and South over the causes of global environmental degradation and poverty (Connelly & Smith, 1999 p.236). The conference allowed the environmental issues to be aired for the first time internationally and witnessed the emergence of United Nations Environment Programme (UNEP).

The publication of Schumacher's (1973) *Small is Beautiful* did have some impacts on awareness of environmental issues. He argued that increased specialisation and the pursuit of profit through big organisations were mainly responsible for economic inefficiencies, environmental pollution and inhumane working conditions. He proposed that small scale economic activities, which emphasised humans and not the product, were the panacea to the problems. He also proposed using technology that was appropriate for smaller working units set in regional workplaces (Schumacher, 1973 p.16-17). Moreover, he encouraged economic activities that emphasised the usage of local labour and resources. As he writes, '[P]eople do not live by exporting, and what they produce for themselves and for each other is of infinitely greater importance to them than what they produce for foreigners' (Schumacher, 1973 p.180).

In the 1970s two high profile environmentally damaging incidents that occurred in the US - Love Canal (1978)[2] and Three Mile Island (1979)[3] - served to focus public attention on the vulnerability of nature and mankind due to the effects of potentially irreversible environmental crises. As Keller (1995 p.11) wrote:

> [L]ong after the crisis has passed, its aftermath lingers. There is the gnawing anxiety over one's health, the health of one's family, and given the typically regional impact of such disasters, the health of one's neighbours. Deeper and more insidious is the erosion of confidence in Science, Authority, and Expertise and, at times, in life itself…….Perhaps the most serious consequence of major environmental accidents, from a sociological viewpoint, is the ensuing decline in respect for authority in science and politics.

It was observed that in the 1960s and 1970s concern about the environment was a quality of life issue (Buchholz, 1993 p.17). The nature of environmental problems was localised and derived from a few largely identifiable sources. There was generally a short time delay between cause and effect and thus a relatively low level of complexity involved in finding a proper solution to address the problems.

2.2.2 The Developments in the 1980s and 1990s

In the 1980s the three highly publicised environmental disasters - Bhopal (1984)[4]; Chernobyl (1986)[5]; Exxon Valdez (1989)[6] had increased the attention of the public on the vulnerability of nature and mankind due to the effects of human activities.

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[2] Love Canal in New York was the area of the worst environmental disaster related to chemical wastes in US history. The abandoned canal was used by Hooker Chemicals and Plastics Corporation as a dumping ground for chemical wastes in the 1940s and 1950s. In later years, the area was filled in and given to the city of Niagara Falls and housing was built over it. In 1978, state officials found signs that toxic chemicals from the landfill had leaked into the basements of these houses, a finding which was subsequently linked to evidence of chromosomal damage in a significant number of neighbourhood residents (Keller, 1995).

[3] Three Mile Island is the name of a nuclear power plant and the island on which it was built in the Susquehanna River. A malfunctioning valve in one of the reactors, combined with other equipment malfunction, led to the partial exposure of the actor core. This exposure in turn led to a build-up of hydrogen gas that escaped into the containment vessel of the reactor building. Although little of this gas made its way into the outside atmosphere, the accident caused a great deal of concern about the safety of nuclear power generation and led to an immediate slowdown in the building and licensing of new nuclear reactors in the United States (Keller, 1995).

[4] Bhopal was the site of the worst industrial accident in history, when 45 tonnes of methyl isocyanide escaped from an insecticide plant that was owned by the Indian Subsidiary of the U.S. firm Union Carbide Corp. The gas drifted over the densely populated neighbourhoods, killing many of their inhabitants immediately. The final death toll was estimated at as high as 2,500 lives (Keller, 1995 p.14)

[5] The Chernobyl accident was the worst accident in the history of nuclear power generation. It occurred at the Chernobyl nuclear power station in the Ukraine. Violations of numerous safety procedures during testing led to an explosion which blew the lid off the reactor and released 8 tonnes of radioactive material

Since the 1980s, public perception of ecological crises has encompassed problems with the ability to manifest deleterious environmental impacts at indeterminate points in the future and over indefinite spatial domains (Bansal & Howard, 1997 p.4-5). The global ecological crises that pose major threats to human survival such as climate change, depletion of the ozone layer and global warming have gained more attention. The climate changes affect everyone on the planet, as does increased exposure to ultraviolet rays because of the depletion of the ozone layer. The ability of these threats to transcend ordinary sensory perception and to materialise without warning or geographical limits, has created anxieties in society (Sachs, 1999 p.27).

Since all of these ecological crises threaten the entire planet, international cooperation among nations is required for their solution (Buchholz, 1993 p.15). International cooperation to cope with the problems culminated in 1987, when the World Commission on Environment and Development (henceforth WCED) introduced the concept of SD in the Brundtland Report entitled *Our Common Future* (WCED, 1987). The report highlights the seriousness of environmental problems due to unsustainable production and consumption. As it states:

> Each year another 6 million hectares of productive dry land turns into worthless desert…More than 11 million hectares of forests are destroyed yearly. ….In Europe, acid precipitation kills forests and lakes and damages the artistic and architectural heritage of nations; it may have acidified vast tracts of soil beyond reasonable hope of repair. The burning of fossil fuels puts into the atmosphere carbon dioxide, which is causing gradual global warming. This 'greenhouse effect' may by early next century have increased average global temperatures enough to shift agricultural production areas, raise sea levels to flood coastal cities, and disrupt national economies. Other industrial gases threaten to deplete the planet's protective ozone shield to such an extent that the number of human and animal cancers would rise sharply and the oceans' food chain would be disrupted. Industry and agriculture put toxic substances into the human food chain and into the underground water tables beyond reach of cleansing. (WCED, 1987 p.2)

Based on the core concept of SD, the report proposed long-term strategies, recommended ways of achieving international cooperation, considered ways by which international environmental concerns could be tackled and created a long-term agenda

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into the atmosphere. Two people died as an immediate result of the explosion, 29 from exposure to radiation, and 200 more contracted serious radiation sickness (Keller, 1995 p.14)

[6] Exxon Valdez' Alaskan oil spill was the most catastrophic maritime oil spill in US history. The oil tanker Exxon Valdez spilled 10.1 million gallons, creating an oil slick which eventually covered 1000 square miles, damaging some of Alaska's most pristine waters, extinguishing wildlife and decimating the tourist and fishing industries (Hutchinson & Hutchinson, 1997 p.21).

for change. Five years later, the UNCED in Rio, Brazil 1992 sought to achieve the strategies of Brundtland's report (Kirkby, O'Keefe, & Timberlake, 1995 p.7). Agenda 21 has proved to be influential in the design and development of national policies and programmes of legislation on the environment (Roberts, 1995 p.81).

2.3 Sustainable Development (SD)

2.3.1 The Concept of Sustainable Development (SD)

The term SD was first used in 1980 in the *World Conservation Strategy* (cited in Sachs, 1999 p.33), but was popularised by the WCED (1987) in *Our Common Future*. There are various definitions of SD[7] and according to Banerjee (2002b p.106) there are more than 100 definitions. The oft-quoted definition from the Brundtland Report, *Our Common Future* defines SD as 'development that meets the needs of present generations without compromising the ability of future generations to meet theirs' (1987 p.8). According to Elliot (1998 p.180) there are two principles underpinning this definition: SD emphasises needs and gives a priority to the essential needs of the poor, and secondly it recognises the limits imposed by technology and social organisation and the ability of the environment to meet present and future needs.

The fundamental emphasis in the Brundtland report is on growth and achieving a 'full growth potential' (WCED, 1987 p.44). This is crucial to overcoming poverty, which is a major cause of ecological crises. Another key idea is that economic growth and environmental protection are not mutually exclusive. Growth, according to SD that is mindful of the limited natural resources. Unlike *Limits to Growth,* which opposes growth and believes it to be the root cause for environmental crises, this report puts forth the idea that growth is essential for environmental conservation and equity. '[S]ustainable Development can only be pursued if demographic developments are in harmony with the changing productive potential of the ecosystem' (WCED, 1987 p.44).

SD perceives that growth can be environmentally efficient, thus generating a 'win-win' situation in which the benefits of contemporary industrial society are retained as well as

[7] Various terms which sound familiar in relation to SD are: sustainability, sustainable growth and ecologically sustainable development, as widely used in Australia. In this study they will be used interchangeably.

a reduction of the burdens on the natural environment (Connelly & Smith, 1999 p.5). As SD warrants efficiency of resources that are both ecologically and economically sound, it has received widespread acceptance by politicians and industrialists as well as environmentalists. The Brundtland report proposed seven major interrelated proposals for sustainability: (i) reviving growth; (ii) changing the growth quality; (iii) meeting essential needs for jobs, food, energy and water; (iv) ensuring a sustainable population level; (v) conserving the resource base; (vi) reorienting technology and managing risk; and (vii) merging environment and economic decision making (WCED, 1987 p.49).

However, as the Brundtland report did not have a blueprint for SD, each country would have to develop its own approach, so there have been different interpretations of SD. Mitchell (1997 p.35) identified some differences on how developed and developing countries interpreted the concept of SD. For the former, the main interest has been to integrate environmental and economic considerations into decision making. Substantial attention has been focused on inter-generational equity issues. They have argued for developing countries to modify their economic activities to avoid further destruction of rain forests and other resources. For the latter, the priority has been to meet the human needs of their citizens, and to ensure economic development. Thus, the focus has been more on intra-generational issues. These countries resent suggestion from developed countries that they should forgo development opportunities from harvesting rain forests in order to protect the global environment. Additionally, the Brundtland report recognises that besides actions of national governments, other institutions like international agencies, businesses and public actions are crucial for the achievement of SD (Cannon, 1994 p.249). In relation to this, international agencies must establish sustainable policies, and consumers must be willing to consume fewer products and use them wisely. Businesses also need to operate in a sustainable manner.

The five-year follow-up to the Brundtland Report, the UNCED of 1992 - Earth Summit - in Rio de Janeiro, Brazil, was the largest environmental conference ever held. The concept of SD was launched as the cornerstone of the international environmental movement. The governments' representatives, international organisations and non-governmental organisations (NGOs) met in the summit. According to Finger (1993 p.39) the summit was considered as an attempt by nation-states and their governments to rehabilitate themselves as pertinent and legitimate players in the eyes of their citizens.

Though many disagreements on the fundamentally different interpretation regarding what SD should mean between developed and developing countries, Agenda 21 was introduced.

2.3.2 Agenda 21

Agenda 21 is considered as the most significant outcome of the Earth Summit, 1992. Its main aim is to provide a framework for the development and elaboration of government and business policies (Roberts, 1995 p.81). Agenda 21 consists of four main sections (Connelly & Smith, 1999 p.240):

- Social and economic dimensions: highlights the interconnectedness of environmental problems with poverty, health, trade, debt and population.
- Conservation and management of resources: emphasises the need to manage physical resources (land, seas, energy and wastes) to further SD.
- Strengthening the role of major social groups: stresses the need for partnership with women, indigenous populations, local authorities, NGOs, workers and trade unions, business and industry, scientists and farmers.
- Means of implementation: discusses the role of governments and NGOs in funding and technical transfer.

The Secretary - General of the UNCED, Maurice Strong had envisaged the main task of the conference in the Earth Summit, as moving environmental issues into the centre of economic policy decision-making which focus largely on the changes that need to be made in economic behaviour to ensure global security (Strong, 1991 p.290-293). Prior to the conference, he asked Stephan Schmidheiny, the UNCED's adviser for business and industry, to prepare a business input for the UNCED and stimulate business interest globally in the issues of SD (Schmidheiny, 1992a p.19). In the run up to the summit, Schmidheiny founded the Business Council for Sustainable Development (BCSD).

Schmidheiny and the BCSD's 1992 publication *Changing Course* (Schmidheiny, 1992b) highlighted the growing recognition of the central role of businesses to achieve the goals of SD (Hutchinson & Hutchinson, 1996 p.184). He used the term 'eco-efficiency' to indicate the idea of adding maximum value with minimum resources and minimum pollution. The concept provided a link between profits and environmental protection; it made good business sense and helped businesses to become more competitive (Beder, 1996 p.238).

It is believed that the Earth Summit had strengthened businesses' interests in environmental management and raised awareness of environmental crises. Schemidheiny's speech to the summit was instrumental in recognising the forces that pushed businesses towards a more ecological viewpoint (Beder, 1996 p.238). At the summit, businesses showed their commitments to SD through various treaties dealing with ozone depletion, global warming and declining of biodiversity (Shrivastava, 1995b p.937). Since the Brundtland Report and the Earth Summit in Rio in 1992, the notion of SD has drawn together an impressive coalition of governments, NGOs, businesses and local authorities (via Agenda 21), who are committed to finding ways of moving economic and social development onto more sustainable trajectories in the 21st century.

2.3.3 Critics of Sustainable Development (SD)

The idea of SD is not without limitations. First, Redclift (1992) points out that the Brundtland Report does not specifically examine what is meant by human 'needs.' Obviously, basic 'needs' to ensure survival are nutrition, health and shelter, but it is not clear how much more than survival is involved in 'needs' in SD. Commenting on this, Daly and Cobb (1994 p.76) and Sachs (1999 p.29) also questioned distinguishing 'needs' from extravagant luxuries. If needs includes such extravagancies, then SD is impossible to achieve. For example, for poor people in developing countries, needs for them are those required for survival - foods, water and shelter, but in developed countries needs are associated with the comforts of living.

Secondly, there is a concern with balancing the interests of present and future generations. This raises the question, how does a society choose how much should be used today and how much should be set aside? (Mitchell, 1997 p.31). This question is perceived more challenging when there are many people today whose basic needs are yet to be met. Hence, SD must be able to address both inter- and intra-generational equity issues. Meanwhile, according to Daly and Cobb (1994 p.76) the statement of not compromising the 'ability of future generations to meet their own needs' is not easy to obtain since it requires an estimate of that ability. It may be estimated on the basis of either strong or weak sustainability, depending on assumptions about substitutability between natural and humanly created capital.

Third, SD is anthropocentric - concentrating on the satisfaction of human needs in the present and the future, rather than the protection of nature (Redclift, 1992 p.395). This contrasts with radical green views that perceive the primary ecological consideration before humans. The major threat to the long-term sustainability of the earth's resources is identified in the key indices of resource degradation. Sachs (1993 p.10) echoed anthropocentric bias of SD: 'it is not the preservation of nature's dignity which is on the international agenda, but to extend human-centred utilitarianism to posterity.'

Fourth, SD has been criticised for being a Western idea. According to Shrivastava (1995b p.941) and Mitchell (1997 p.29) SD is based on Western definitions of developmental progress where the degree of civilisation is indicated by the level of production; nations compete for a better position on the Gross National Product (GNP). Based from this premise, non-western countries are strongly encouraged to improve their economy to achieve developed status to be on par with their western counterparts. As a result, natural resources are drastically exploited to pursue economic growth that is seen as an end in itself. Nevertheless, the growth in GNP does not always relate to a growth in quality of life; developing countries not only experience ecological crises but also social problems such as poverty, and a widening gap between the rich and poor.

Lastly, opponents of the concept of SD criticise the idea that environmental conservation and sustaining economic growth is perceived as a positive-sum game, where growth is considered as a prerequisite for SD. They make the challenge that there is no sustainability without development. They are pessimistic of this idea. Sachs (1993 p.33), for example argues:

> [S]ince development is conceptually an empty shell which may cover anything from the rate of capital accumulation to the number of latrines, it becomes eternally unclear and contestable just what exactly should be kept sustainable. This is reason why all sorts of political actors, even fervent protagonists of economic growth, are today able to couch their intentions in terms of 'sustainable development'. The term become inherently self-referential, as a definition offered by the World Bank neatly confirms: 'What is sustainable? Sustainable development is development that lasts.

2.4 The Approaches to Sustainable Development (SD)

There are a number of approaches to SD. They include a neo-classical market economy (NME), an industrial ecology, ecological modernisation theory (EMT), eco-feminism

and deep ecology. In this literature, only two popular management approaches - NME and EMT will be discussed at length. Though the approaches will be discussed separately, they are not mutually exclusive.

2.4.1 The Neo-Classical Market Economy (NME)

W.S. Jevons (1835-82), Alfred Marshall (1842-1924), Carl Menger (1840-1921) and Leon Walras (1834-1910) laid the foundations of the NME (Stretton, 1999 p.80). They argued that, not only can the market be utilized to allocate resources to deal with economic activities *per se,* but also with all the problems that society faces - including environmental issues. Resources (land, capital, raw materials and labour) are considered to be the major inputs to production processes, but they are generally scarce. Scarcity of resources is determined by comparing the amount available with the amount required, and by the interaction of supply with demand (Common, 1996 p.8). The scarcity of the resource predicts a higher cost, thus businesses could not help but choose the least costly methods to maximise the profit of their investment. In the NME, the types of business activities in which a firm becomes involved will be determined by the demand of what consumers want and how much they are willing to spend. Higher income consumers will relatively demand more products than lower income consumers[8]. Since material wealth is given more priority, one's status and one's self worth depend on the quantity and quality of goods consumed (Weaver, 1976 p.180).

Another important principle is open competition and to ensure fair competition, monopoly by any particular firm in the market is not permitted so as to assure consumers may have a choice between competing products. Additionally, the existence of a number of competitors would motivate firms to use their resources efficiently. When resources, chiefly land and labour, are scarcer, firms look elsewhere and make investments in a place that offers lower resource costs. A firm will then gain an advantage over competitors when it is able to maximise profits through its products or services offered to the market. Foreign direct investment (FDI) allows businesses to buy up cheap resources in other parts of the world to minimise production costs. Open market economy coupled with globalisation through various free-trade treaties such as

[8] Economists have traditionally assumed that people's wants are unlimited. Given more income, they will always think of something to spend it on.

the General Agreement on Tariffs and Trade (GATT) and the North American Free Trade Agreement (NAFTA) have facilitated this process.

The NME also assumes consumers act rationally when they are equipped with full knowledge of products that they want to buy (Edwards-Jones, Davies, & Hussain, 2000 p.18). They can freely determine how to spend their money; they are sovereigns over their own decisions regarding what to consume. This concept is known as consumer sovereignty (Edwards-Jones *et al.,* 2000 p.33). The NME also believes the market mechanism works perfectly if there is no interferences from external controls - subsidies and taxes are opposed. The best government is the one that governs least (Common, 1996 p.12). The government should not regulate the market system to avoid inefficiencies and misallocation of resources. Instead, governments should focus on removing inflation, maintaining interest rates, and promoting efficient use of resources through sensible taxation systems (Porter, 1991 p.15).

Another important principle is discounting the future, which explains the implicit weighting of the present over the future. Individuals in this context express preferences about when benefits and costs are desired. Typically, the later a cost or benefit occurs, the less it matters; it is better to reap the benefit of the investment now rather than tomorrow. The main rationale is firstly because of capital productivity; what is gained now can be put to productive use and secondly, people are impatient to see the profits (Pearce, Markandya, & Barbier, 1989 p.132-133).

Armed by the above principles, businesses are created in a society to pursue growth as an end in itself. At the industry level, businesses growth is measured by financial performances - total assets and equity profits to name but two. As for current and prospective stockholders such ratios are strong indicators of business health and return on their investment. At the macro level, a country's economic growth refers to the annual increases in GNP[9]. The economic growth in turn brings prosperity to the nations where people are well fed, adequately housed, comfortably clothed, well educated and

[9] GNP is one way of measuring national income. Another is Gross Domestic Product (GDP). GNP includes all income earned by the nationals of a country, whether the relevant production takes place in that country or abroad. GDP measures all income earned within the country's borders.

medically cared for. In this respect the objective of a government is to ensure its country's GDP increases from time to time.

NME economists advocate strongly that the high per capita living standards in Western societies that have used this market system since the industrial revolution shows a convincing evidence of its superiority (Roger, Ma, Gilvray, & Common, 1999 p.4). Believing that such a growth was a panacea for economic backwardness, developing countries soon adopted the same economic philosophy after becoming independent.

However, increasing public awareness on environmental management compounded by more stringent environmental regulations has exerted pressure on businesses to be more environmentally conscious (Shrivastava, 1995a p.184). In contrast with popular belief that the onslaught of business activities cause environmental degradation, NME economists argued that economic and ecological goals are mutually supporting (Porter, 1991 p.1). The introduction of natural resources into NME models occurred in the 1970s, when economists first systematically investigated the efficient use and depletion of natural resources. A new branch of NME that incorporates SD is known as environmental economics[10].

According to Pearce *et al.* (1989 p.5-11) the central theme of environmental economics is the need to allocate proper values to the services provided by natural environments. The so-called 'Tragedy of Commons' can be avoided if proper values are given to the nature. There are two ways markets can be restructured to ensure that environmental services enter into the market system. Firstly, the market should be created through property right: for example, all natural areas could charge entrance fees, coastal zones could be placed under private ownership with the owner charging for the use of coastal waters. This approach is known as the full privatisation option or Free Market Environmentalism (FME). Secondly, the market could be modified by centrally deciding the value of the environmental services and ensuring that those values are incorporated into the prices of goods and services (Pearce, *et al.*, 1989 p.155). This approach is known as Market Based Instrument (MBI).

[10] Environmental economics consists of green economy, and ecological economy. Although both use NME foundations in their approach to dealing with environmental issues, they are different from one another in numerous ways. They are used interchangeably in this discussion.

The proponents of FME argue that most of environmental problems can be solved by creation and enforcement of tradable property rights in environmental 'goods' and 'bads'[11]. Environmental degradations, like resource depletion and pollution, are not seen to arise due to market forces but rather from an absence of well-defined, universal, exclusive, transferable and enforceable property rights in respect of common environmental assets (Eckersley, 1993 p.5). The FME economists hold the idea that voluntary exchanges between the holders of property rights will enable the internalisation of environmental externalities and a more efficient allocation of resources. This approach is preferable to government regulations because it decentralises and depoliticises environmental resource allocation decisions.

Generally, there are two types of MBI that can be applied. One is through taxes, fees and charges; and the other is the polluter pays principle (PPP) or marketable permit (Moran, Chisholm, Harley, & Porter, 1991 p.18). The former encourages polluters to reduce their pollution as the revenue raised from such charges can be used to compensate for natural capital depletion. The latter is viewed as an efficient means to environmental objectives because they combine market flexibility with the outcomes certainty provided through regulations (Kinrade, 1995 p.95). Ideally, these two means ensure there is no divergence between the private costs of production and consumption and the social and environmental costs of production and consumption[12].

The proponents of MBIs argue that there are two-fold deficiencies of Command and Control (CAC) approaches in addressing the environmental issues. First, they offer inadequate incentives to search for more cost-effective approaches. Second, CACs suffer from a scarcity of information available to bureaucratic planners who formulate the specific decisions; this in turn hampers the abilities of the approaches to assist efficient resource allocation (Moran *et al.*, 1991 p.16).

2.4.1.1 Criticisms of the NME

There are a number of criticisms of the NME. The first is related to the concept of growth itself, where there is no limit to growth. At the macro level, GNP is considered

[11] See Anderson & Leal (1991); Moran, Chisholm & Porter (1991) and Bennett & Block (1991).
[12] For general discussion see (Pearce *et al.*, 1989)

as good for a country, however growth itself can be uneconomic. According to Daly (1999 p.8) there are costs incurred by GNP growth especially towards the environment. He writes 'There are costs of depletion, pollution, disruption of ecological life-support services, sacrifice of leisure time, disutility of some kinds of labour, destruction of community in the interests of capital mobility, takeover of habitat of other species and running down a critical part of the inheritance of future generations.'

Dally (1999) added that, GNP not only fails to measure these costs but counts them as benefits such as the costs of cleaning up pollution. At an industry level, the negative impacts of a growth concept on businesses are also seen. Eckersley (1992 p.121) argues that the most basic reason for this is that the profit motive demands that firms 'grow or die'. As a consequence, there are many situations in which market rationality gives rise to 'negative externalities' such as resource depletion and pollution which are the unwanted side-effect of capital accumulation.

Another consideration is related to the concept of utility. Since the price of a commodity in the NME is based on utility that the resource yields to consumer, things that cannot be traded on the market have no value. Economics deals with goods in accordance with their market value and not in accordance with what they really are (Schumacher, 1973 p.36). This is supported by Buchholz (1993), who gives the example of rain forests having no economic value in their natural state and having value only when the trees are cut down and sold on the market, or the land is used to plant crops. The same is also observed for industrial wastes -they are discharged into the environment without a proper treatment. Any treatment of their wastes would put businesses at a disadvantage because those costs would have to be reflected somewhere -price of their products.

Another disadvantage of the NME is seen in the excessive exploitation of natural resources in the third world by multinational corporations (MNCs) to fulfil increasing demand for products in developed countries. Environmental degradation due to economic activities that pay no attention to the natural environment is known as a market failure (Edwards-Jones *et al.*, 2000 p.36). Since such effects are considered as externals to the market they are ignored by businesses and it is up to the government to intervene to address them (Smith, 1995 p.64).

Another important concept of the NME that faces strong criticism is discounting the future. Eckersley (1992 p.122) argued that market rationality gives priority to short-term interests over long-term interests. She added that this creates a structural bias again future generations. This is supported by Jacobs (1991 p.33) who argued that discounting the future means that a market system does not provide fully for future. He provided two examples: resources which generate very slowly, such as tropical forests where the periods over which conservation measures would prove worthwhile is much longer than the period in which investors expect their investments to show a return; and sustainable resources which not only have value to their owners but also provide benefits to human - essential life support, of genetic diversity maintenance and climate regulation.

Furthermore, opponents have criticised the principles underlying the internalization of the externalities of the natural environment of the FME and MBI. Eckersley (1993 p. 9) criticises the environmental orientation of FME that is considered as 'technocentric'. She argued that it has four principal characteristics that are not environmentally sound. First, it is sceptical towards the idea that there are limits to growth. Secondly, it involves an unrestrained development philosophy that is concerned to maximise economic output. Thirdly, it is characterised by a scientific and technological optimism and a general belief that human ingenuity will solve any ecological problems. Finally, it emphasises material values and downplays the significance of non-material values. In the similar vein, Jacobs (1995 p.46-70) argued that the FME and MBI have been particularly concerned with instruments rather than on the question of how the benefits and costs of environmental policies are distributed among society. For him 'Willingness to Pay' tends to be weighted in favour of those with a greater income. The poor people tend to live in polluted neighbourhoods because they unable to pay for a better environment. He believed (1991 p.35) inequality of income is a direct cause of degradation in developing countries. For example, 40 percent of the rainforests in Brazil have been cleared in the last 40 years for cattle pasture and soy bean production to fulfil increasing demand for meat in the Western market (Worldwatch Institute, 2004).

Finally, despite the promise of green markets, green technology and anticipated environmental benefits as being claimed by NME economists, they should be embraced with caution. As Kettl (1993 p.127) argued, not all markets perform as textbook accounts would have them. The premise of consumer's sovereignty is debatable, for

example chain production such as the cradle-to-grave perspective may be obscured. According to Kettl (1993) consumers are not all models of rational decision-making, market imperfections may deny them effective choice. In certain circumstances, markets can be more coercive than governments, and private scrutiny more penetrating than that brought to bear by the state. Some observers have suggested that the upstream influence of large purchasers of agricultural products contribute not to stewardship of the land but rather to environmentally irresponsible use of pesticides, fertiliser and irrigation water (Grabosky, 1995 p.221).

2.4.1.2 Studies of the Application of the Market Based Instruments (MBIs)

The MBIs have receiving increased attention as a way to improve environmental quality and there has been substantial experimentation with MBIs. However, it is important to note here that the application of MBIs is not as in the text books; they have been used together with CAC. Various researchers have studied the implementation and efficiency of the instruments. One case in point is a study conducted by Burtraw (2000) who assessed the Tradable Sulphur Dioxide Emission Permits Programme in the US electricity sector. He found the total cost of the programme was 40 per cent to 140 per cent lower than projections. The marginal costs of reductions were less than one-half the cost considered in most analyses at the time the programme was introduced. Innovation accounted for a large portion of those cost savings.

Meanwhile, in Finland, the assessment of a government working group on environmental taxation showed that the energy and carbon taxes have reduced carbon emissions by over 7 per cent during in the period from 1990 to 1998. In electricity and heat production, the reduction was mainly the result of replacing coal and oil with natural gas and wood. Although the price flexibility of the energy demands of the industry was assessed as small, the reduction of energy demand has been remarkable, because the tax on fossil fuels has risen seven to eleven-fold (Sairinen, 2003 p.84). A further study by Hahn (1995) examined marketable permits and emission charges in the US and Europe. His revealed that the level of cost savings resulting from implementing charges and marketable permits was generally far below their theoretical potential. Despite some reductions of environmental pollution, he found the direct effect of both MBIs on the environmental quality appeared neutral or slightly positive.

Christoff (1995 p.157-193) examined the usage of MBIs in Australia. Overall, he found Australia was behind Europe in implementing the mechanisms. The main mechanisms used were fees and charges, primarily imposed as revenue-raising measures but often at levels inadequate to ensure that polluter-pays policies were met. Though innovation occurred, tradable permits were shown to be of limited applicability due to size and composition of domestic industries. Additionally, a series of contradictory pressures prevailed in the country. First, intergovernmental conflict and a lack of coordination of environmental policy between three tiers of government - commonwealth, state and local. Significant political tensions continued between states and commonwealth over the orientation and implementation of environmental policy. Second, the states compete for domestic and foreign investment. In the absence of national coordination of industry development, this would increase the vulnerability of individual states to industrial pressure and lead them to shun the MBIs. Finally, sectoral community interests had expressed hostility towards the imposition of the MBIs as disincentives for resource use for reasons of social equity and regressivity of most environmental charges.

The studies of the application of the MBIs is not only limited to developed countries, but also pertain to developing countries. A study by O'Connor (1994 p.132) in East Asia, has found MBIs not being widely employed. There are a few plausible explanations. First, they are new, relatively unfamiliar and so far largely untested. Given the limited experience with MBIs, there may be an unacceptably long learning period before they can be made to function effectively. Furthermore, MBIs do not necessarily streamline monitoring and enforcement but actually complicate it. Also, by comparison with marketable permits, pollution taxes may appear - at least in terms of familiarity and ease of implementation - relatively attractive for policy makers. Lastly, there has been a certain reluctance on the part of environmentalists and the public to validate the notion that firms could buy and sell the 'right to pollute'.

Recently, a comparative study on the cost effectiveness of MBIs and regulation was conducted by Pandey and Bhardwaj (2004) in India. Using a conceptual model that incorporated the number of emission sources, they examined the compliance cost under an intra-plant emission trading system. The model was applied to an integrated steel plant in the country. Their findings demonstrated that the emission trading was more cost effective than the existing regulatory system. The results showed that intra-plant

trading would result in significant savings to the industry, while contributing to an improvement in ambient air quality in India.

In Latin America and the Caribbean,[13] the implementation of MBIs was studied by Huber, Ruitenbeek and Motta (1998). Among popular instruments that had been implemented were: credit and tax incentives, cost-recovery tariffs, deposit-refund systems, resource use charges, water charges and conventional tax. The study recognised the potential efficiency gains from MBIs, but the driving force towards MBIs implementation had been the goal of raising revenue rather than environmental protection *per se*. The study also found the budgetary constraints faced by the environmental management sector turn MBIs into an attractive option for collecting the necessary funds to improve CAC application. It was very clear that MBI initiatives were sought as complementary actions to the CAC. The MBIs were seen to provide innovative and flexibility to enforce CAC instruments such as standards, licensing, zoning and permits. Moreover, the administrative demands of MBIs remain high.

2.4.2 The Ecological Modernisation Theory (EMT)

The Ecological Modernisation Theory (EMT) was first developed during the early 1980s against a Western European background, especially in Germany, the Netherlands and the UK (Mol & Sonnenfeld, 2000 p.5). The socio-political, economic and cultural backgrounds of that region largely constituted EMT foundation. Among significant contributors to the early period of its birth were: Huber, Simonis and Jänicke from Germany, and Arthur, Mol, and Spaargaren from the Netherlands. The theory has evolved 'breadth and depth'[14] over the last two decades and become a full-fledged theory in environmental sociology at the end of 1990s.

[13] The investigation covers a panel of 11 countries (Barbados, Bolivia, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico, Peru, Trinidad and Tobago, and Venezuela) and a cross-section of issues (water supply and abstraction, water quality, air quality, energy, solid and liquid waste management, toxic substances, noise, and agriculture) within an urban setting.

[14] EMT in the first place, emphasises important role-plays by technology in consumption and production related to industry, overtime it focuses on socio, political and economic players as drivers for contemporary ecological reform. A number of studies of EMT were carried out in Western European countries.

There is no single common definition of the EMT:

> [F]ocuses on prevention, on innovation and structural change towards ecologically sound industrial development (Paulus, 1986, cited in Simonis, 1989 p.347).
>
> [T]he discourse that recognises the structural character of the environmental problematique but assumes that existing institutions can internalise the care for the environment (Hajer, 1995, cited in Sonnenfeld, 2000 p.236).
>
> [A] social theory that analyses the changes in modern society's institutions and practices that are relevant in safeguarding the sustenance base (Mol, 1999 p.170).

In common, the definitions highlight three key words: institutions; change; and ecology. It recognises the important role of modern institutions as means to achieve SD, as Hajer (1996 p.248) puts it: '[E]conomic growth and resolution of ecological problems can, in principle, be reconciled.' Thus, an EMT approach to overcoming environmental degradation is through the path of modernity, which requires the restoration of structural design faults of modernity via transformation of modern institutions in line with principles of ecology. An example of a design fault is the way the NME perceives nature, as a black box in relation to production, where it delivers inputs in the form of energy and raw materials and would absorb and process outputs in the form of waste. Over-exploitation of nature in an unsustainable way is related to this philosophy. The EMT proposes that institutional change must occur at the macro-economic level through broad sectoral shifts in the economy to new and clean technologies (Gibbs, 2000 p.12). It is encouraged by a market economy and facilitated by an enabling state.

2.4.2.1 Core Institutional Reform under the EMT

Overall, EMT emphasizes institutional reform of these four institutions of modernity:[15]

(1) Changing role of science and technology

The EMT sees science and technology not only as the culprits in environmental degradation but they are valued for their role as a means to address it (Mol, 1996 p.313). In the early stage, emphasis of the study of theorists was on the technological institutions. The central idea is from the often-quoted statement from Huber (1985, p.20, cited in Spaargaren & Mol, 1992 p.334) 'the dirty and ugly industrial caterpillar

[15] It is important to note here that, these institutions interact and influence one another, and in real situations sometimes their functions overlapped with one another. But for the sake of discussion each will be examined separately.

will transform into a ecological butterfly.' The idea that modernising modernity is achieved through modernisation science and technology is also supported by others EMT theorists like Hogenboom, Mol and Spaargaren (2000 p.103) from the following statements:

> [S]cientific knowledge and modern technology have proved not to be a static and monolithic block, but are reflexively modified and increasingly relate to solutions to environmental questions, and not only or mainly to the origination of environmental catastrophes.

The same view was also echoed by Weale (1992 p.76) as he writes:

> Instead of seeing environmental protection as a burden upon the economy the ecological modernist sees it as a potential source for future growth. Since environmental amenity is a superior good, the demand for pollution control is likely to increase and there is therefore a considerable advantage to an economy to have the technical and production capacity to produce low polluting goods or pollution control technology.

Huber's early study of EMT not only mentioned the pivotal role of technology but also gave an example of the modification of processes of production and consumption according to ecological criteria. As he said, 'the central economic theme of the socio-ecological reconstruction will be the ecological modernization of production and consumption cycles by the introduction of new and more intelligent technologies' (Huber, 1985 p.174, cited in Mol, 1995 p.38). He highlighted the shift from the traditional first-generation (curative) technologies towards the second-generation environmental technologies geared for a clean production process. For example, the introduction of end-of-pipe and clean-up technologies in the 1970s was replaced by cleaner production technologies in the 1980s. The ecological transition of the technological process is called 'superindustrialization' where environmental quality improvement hinges on the development, innovation and diffusion of new key technologies towards environmentally friendly technology - efficient consumption and production, dematerialization and energy saving technology.

(2) Increasing importance of market dynamics and economic agents

The EMT recognises the increasing importance of economic and market dynamics and economics agents (such as producers, customers, credit institutions) as social carriers of ecological reform (Mol, 1995 p.313). The concept of EMT involves the development of 'economization of ecology' by means of the introduction of economic concepts, and

mechanisms directed at protecting the environment. For instance, internalising externality into a factor of production: eco-taxes, environmental liability and ecologically sound products. This will accelerate the ecological transformation process, because the market is considered to be a more efficient and effective mechanism to address environmental problems than the state. Market forces, innovative entrepreneurs, and consumers among others, will emerge as new important forces in and social carriers of socio-ecological transformation (Mol, 1995 p.46).

(3) Transformations in the role of nation-state

The EMT also recognizes the role played by the state, which has a responsibility for redirecting the processes of production and consumption in line with the ecology (Hogenboom *et al*., 2000 p.96-97). This is in contrast with NME, which supports the idea that the state should play a reactive role in addressing environmental degradation (as discussed in section 2.4.1).

According to Mol (1995 p.46), the state should modernize its environmental involvement in two ways. First, shifting some responsibilities and incentives for environmental reform to the market. Ecological taxation, levies, value-added differentiation, and charges create economic distinctions in products and production processes on ecological grounds can be introduced. Additionally, private economic players can become involved in triggering environmental reform, for example when consumers demand the certification of products and processes; credit institutions ask for environmental audits of industrial producers; industries compete on environmental performance; and producers search for niche markets. Second, in those areas where the state continues to fulfil a central role, its hierarchical and centralized functions should be abandoned. Instead, it should follow the movement towards the creation of global economic interdependencies, the necessity for flexibility in environmental planning and state environmental policy changes from curative and reactive to preventive. The central idea of this transformation is not a withering away of the state in environmental management, but rather a transformation in the relationship between state and society.

(4) Modifications in the position, role and ideology of social movement

Mol (2000 p.47-50) identifies three central themes of transformation that occurred in ENGOs in Western European countries in the 1970s-1980s and the 1990s:

a. Changing ideologies that prevail in the movement

As in the past organisations still opted for radical environmental reforms, but no longer connected them to overall and massive social transformation that would change industrial society beyond recognition. While they maintained the idea of fierce opposition against the capitalist economic system, industrialisation and any form of large bureaucracy, these ideas have moved from a core position to the periphery.

b. Modifications in the position of ENGOs vis-à-vis other players

ENGOs were more reformist and focussed on environmental quality, but lost their monopoly on agenda setting and the representation of environmental interest. This is due to growing environmental state bureaucracy, the environmental consultants, the utility sector, scientific institutions, and environmental industries.

c. Transformations in the operations of ENGOs between state and market

The ENGOs are no longer perceived by the state as the coalition partners they used to be. On the other hand, the market players are no longer by definition interpreted as the movement's main opponents. The state also realises the positive effects brought by the market players. For example, increasing coalition between ENGOs and businesses.

2.4.2.2 Criticisms of the EMT

There are a number of criticisms of the EMT. The first is with its definition of nature itself. As with the NME, the EMT views of nature primarily as the material sustenance base to humans is perceived as anthropocentric where nature does not have any rights on its own (Mol, 1996 p.315). Without acknowledging the rights of nature, it is not possible to develop a deep concept of responsibility towards it. According to Bluhdörn (2000 p.214) there are two drawbacks to this kind of definition: (i) it excludes all aspects of nature as a non-material entity, such as emotional and sensual experiences, the integrity or intrinsic value of nature, among others, which are the main components

of environmental problems; (ii) though science provides a more or less accurate description of physical changes of the environment, it fails to decide which conditions in, or components of, the environment are worth protecting.

Second, the EMT does not properly deal with the capitalist mode of production and (over) consumption, instead preferring eco-efficient transformation of production-super industrialization. The question raised by the critics of EMT is how the improvements in efficiency can be easily out-weighted by the expansion of production that comes with modernity (Carolan, 2004; York & Rosa, 2003). Schnaiberg & Gould (1994) argued that due to efficiency in production, producers have an incentive to continually expand production for more profits at the expense of the environment.

Third, the EMT is achieved at the expense of the natural environment in developing countries. York and Rosa (2003 p.279) argued that a nation may reduce its impact on the environment within its borders simply by importing resources and exporting waste. This is what Ehrlich and Holdren (1971) called the 'Netherlands fallacy', in reference to the fact that a large share of the resources consumed in the Netherlands comes from developing countries. Sonnenfeld (2000 p.254) questioned this when he asked, 'Is ecological modernization in advanced industrial societies dependent upon increased materialization elsewhere [developing countries]?' Furthermore, Sarkar (1990) perceives the EMT approach gives legitimate licence to the North for more economic growth and to use more resources at the expense of the Third World[16].

Fourth, EMT considers the free market and enabling state as well-matched and complementary to each other. Collaboration between various interests is expected to work smoothly for the betterment of the environment. What the EMT neglects is that modern society consists of very divergent interests and that inequalities of wealth and power are prevalent as a result of the process of market economy. In this vein EMT appears to be, '[I]ndifferent to the processes by which its project is brought about. It may be thought that an authoritarian regime is equally as able to enforce modernisation

[16] Sarkar observed there was a change in the idea of growth in the ecological movement in West Germany. Before the idea was that economic growth was incompatible with ecological survival and the West's high material standard of living were only possible at the expense of the Third World. Western economies would thus have to shrink in order to ensure ecological and social justice. Over time this has changed; it now claimed that an ecological society is possible with the same material standard of living.

as a liberal, pluralist one – and both are unlikely to address questions of social inequality' (Blowers, 1997 p.854).

Lastly the EMT discourse is being criticised as Eurocentric – it has occurred within the intellectual milieu of late Western European capitalism, mainly in the Netherlands, Germany and the UK. An important question here is, is it relevant or applicable to non-Western developed countries and developing countries which are socially, politically and economically different from those countries? Buttel (2000 p.32) argued that political structures and state structures and social institutions are not the same everywhere. The following discussion highlights the empirical studies of the applicability of EMT in non-Western Europe countries.

2.4.2.3 Studies of the application of the EMT in Non-Western European and Developing countries

Although proponents of EMT such as Mol and Sonnenfeld (2000 p.6) and Murphy (2000 p.3) concurred that the theory is also applicable in non-European industrialised countries such as the US and Japan, it is only partly true. A number of studies have found inconsistencies of the EMT in the US and Japan. For instance, Pellow, Schnaiberg and Weinberg (2000) used the case study of consumer waste recycling in the US. Three critiques of EMT arose from the study. First, they found there was no convincing evidence that the environment has been emancipated from the economy in decision-making criteria. Recycling demonstrates the strong characteristics of capitalist production of economic gains rather than concerns for the environment. Second, the modernisation of recycling appears to lead only minimally to a very narrow set of ecological gains. Though, there was some reduction of natural resources due to recycled materials, these gains came at the expense of more ecologically sound forms of waste disposal, such as not-for-profit small recycling centres. Finally, recycling exposed workers who sorted recycled materials to various environmental hazards.

Another study of EMT in the US was conducted by Gonzalez (2005) who studied urban sprawl and its contribution to global warming. He found, such a diffusion of urban development results in a higher energy usage for transportation and the heating and cooling of spacious homes on the urban periphery. Even though such activity is

considered as environmentally unfriendly, leading business organisations seeking to curb anthropogenic climate change gases do not attempt to reform sprawled urban landscape. They promote technological reforms that allow such a practice to continue because urban sprawl pushes up demand for automobiles and household appliances.

A study by Imura (1997 p.79) on the Japanese government structure, found Japan lacks a system that allows for citizens to review government decisions and access government information. This finding supported a previous study by Schreurs (1996) who asserted that the environmental policy networks actively reinforced the government hegemony by excluding critical commentators from advisory committees. Schreurs added that because the ministries have the right to select who will sit on these committees, there is no place for ENGOs to criticise government action. Additionally, Huber's study (2000) highlighted the lack of environmental reporting as well as stakeholder communication among Japanese corporations. In comparison to European corporations, Japanese corporations may be confronted less with political and civil society counter powers (Huber, 2000 p.276). In a later study, Revell (2002) found that although some environmental reform is occurring in the Japanese companies, dynamics and changing ideologies were not pushing these reforms in the way which was expected under the EMT. There was little pressure from customers or suppliers to restructure ecologically despite conflicting economic and environmental interests, and there was little evidence that business agendas were being refashioned to reflect sustainability objectives.

When it comes to developing countries, Blowers (1997 p.854) is sceptical of the relevance of the EMT. Using the EMT as a framework, Sonnenfeld (2000) studied pulp and paper manufacturing in the South East Asia. He found the industry, especially big factories have ecologically modernised in a number of ways. They have made a significant move in reducing the amount of waste as well as consumption of water in their production due to the usage of new environmentally friendly machinery. Among important mechanisms for institutional reforms of these industries are market (notably, European market), science and technology, local environmental agencies, local and international ENGOs. But, in contrast with EMT principles, 'dematerialization' was not being widely practised, instead studied companies had relied more on raw materials from native forests and tree plantations rather than recycled materials in production.

Overall, So Sonnenfeld's study partially supported the usage of the EMT in the industry in these countries.

A further study was conducted by Frijns, Phuong and Arthur (2000) in Vietnam. The study focused on three issues - state-market relations, technology development and environmental awareness. In many aspects the authors found these institutions did not conform to EMT notions. The country's environmental policy used CAC which is characterised by laws, standards and regulations pertaining to emissions and products as the main instruments. Despite the existence of all these environmental regulations, they were not strictly practised as they were hampered by a lack of enforcement, and by various sorts of corruption among state officials. The MBIs, like polluter pay principle and marketable permit are still lacking and the development in environmental technology was still in an infant stage, hardly any first generation environmental technology was found. The same also observed for her environmental movement. Proactive ENGOs were absent, only have recently gained a foothold. The findings showed the EMT is of limited value to analyse the contemporary process of and attempt towards environmental reform in Vietnam.

2.5 Business Environmental Issues and Stakeholders Pressure

Since every business organisation has an impact on the environment, they each need to be more environmentally conscious to try to arrest environmental problems. Stakeholders' pressure impinging on businesses to do so has been increasing over the past three decades.

2.5.1 Business and Environmental Issues

Every business, whatever its size, sector or location has an impact on the environment. According to Hawken (1993 p.12) business has three basic issues to face pertaining to the environment: first, in order to produce products, business takes too much from the environment and does so in a harmful way; second, the products it makes require excessive amounts of energy, toxins, and pollutants; and finally, the method of manufacture and the products themselves produce extraordinary waste and cause harm to present and future generations.

2.5.2 Businesses and environmental pressure

Industry's attitude towards the environment has come a long way over the past three decades. During the 1970s and the early 1980s businesses at large responded defensively against environmental pressures (Long, 1991). They asked questions like 'Why are outsiders telling us what to do?' (Greeno & Robinson, 1993 p.223). According to Newman and Breeden (1992 p.211) businesses viewed environmental concerns at that time as less urgent because they lacked information on the cause and effect of pollution, as well as its life cycle cost, and had misconceptions about an endless supply of raw material and disposal options.

The introduction of the concept of SD stimulated various reactions from businesses in general and the manufacturing industry in particular in response to the new environmental challenges. In the 1980s, businesses began to accommodate regulators in order to avoid significant legal liabilities (Greeno & Robinson, 1993 p.223). During this particular decade businesses developed their own interpretations of environmental management and adapted a series of management practices that were an extension of pre-existing management skills, frequently using accounting, quality management systems and health and safety systems as a model.

Nonetheless, the early 1990s witnessed a transformation; the relationship had begun to shift away from being adversarial to a position of greater collaboration and co-operation (Utting, 2006 p.2). Best practices of environmental management like ISO 14000 (issued by the International Organization for Standardization), and life cycle assessment (LCA) tools began to be adopted by businesses. Increasing environmental awareness, increasing the quality of environmental information available to businesses and introducing eco-management tools and techniques enabled businesses to take advantage of the opportunity to improve their environmental performance.

2.6 Stakeholders Environmental Pressure

2.6.1 Stakeholder Theory

The Stakeholder Theory emerged in the mid 1980s. One focal point in the movement was the publication of Edward Freeman's book, *Strategic Management: A stakeholder*

approach, in 1984 (Freeman & McVea, 2001 p.189). The central task in a strategic management process is to manage and integrate the relationships and interests of shareholders, employees, customers, communities and other groups in a way that ensures the long-term success of the firm (Freeman & McVea, 2001 p.192).

The term stakeholder is borrowed from the corporate governance literature, it connotes all the constituencies effected by or interested in the activities of a firm. Freeman (1984 p.46) defines stakeholder as 'any group or individual who can affect or is affected by the achievement of the organization's objectives.' Caroll (1996 p.60) defines a stakeholder as 'any individual or group who can affect or is affected by the actions, decisions, policies, practices, or goals of the organization'. Meanwhile, Buchholz defines stakeholder as '[A]n individual or group that has some kind of stake in what business does and may also affect the organisation in some fashion' (1993 p.347) . According to Clarkson 'stakeholders are persons or groups that have, or claim, ownership, rights, or interests in a corporation and its activities, past, present, or future' (1995 p.106).

Among various definitions of stakeholders, Freeman's definition is the most widely quoted and used in environmental management literature (Banerjee, Iyer, & Kashyap, 2003 p.107; Sternberg, 1997 p.4; Moir, 2001 p.19; Brammer & Millington, 2004 p.1413). The definition of stakeholder from Freeman will be used in this study. Apart from being widely quoted, there are others two reasons why Freeman's definition is preferred. First, its broad definition offers a wide field of possibilities as to who or what a stakeholder really is. By doing so it avoids any exclusion of potential stakeholders. This is essential as different industries have different important stakeholders they need to consider. Moreover, stakeholders' importance to businesses may also change in time and space. Second, Freeman's definition is applicable to this study as its connotes strategic and moral values of stakeholders (Goodpaster, 1991). With the strategic stakeholder (the one who can affect a firm) there is a managing of interests of the stakeholder. The emphasis on managing the stakeholder makes this approach unidirectional in nature, with relationships being from a firm's point of view. On the other hand, with the moral stakeholder (the one who is affected by a firm), stakeholder theorists seek some balancing interests.

A manager needs to understand the concerns of stakeholders in order to develop objectives that stakeholders would support for his or her organisation's long-term success. Therefore, business relationships with all stakeholders in developing effective business strategies should be explored (Freeman & McVea, 2001 p.190). The number of stakeholders and variety of their interests can be quite large; thus, a company's decisions can become very complex (Henriques & Sadorsky, 1996 p.383; Post, Lawrence, & Weber, 1999 p.7). But in practice, it is difficult and costly to identify and meet all the stakeholders' demands. Consequently, it is crucial for the manager to identify and analyse the meaning and significance of each individual group and to determine their respective power to be prepared for the conflict that may follow from the prioritizing of competing groups of stakeholders (Madsen & Ulhoi, 2001b p.79).

2.6.2 Types of Stakeholders

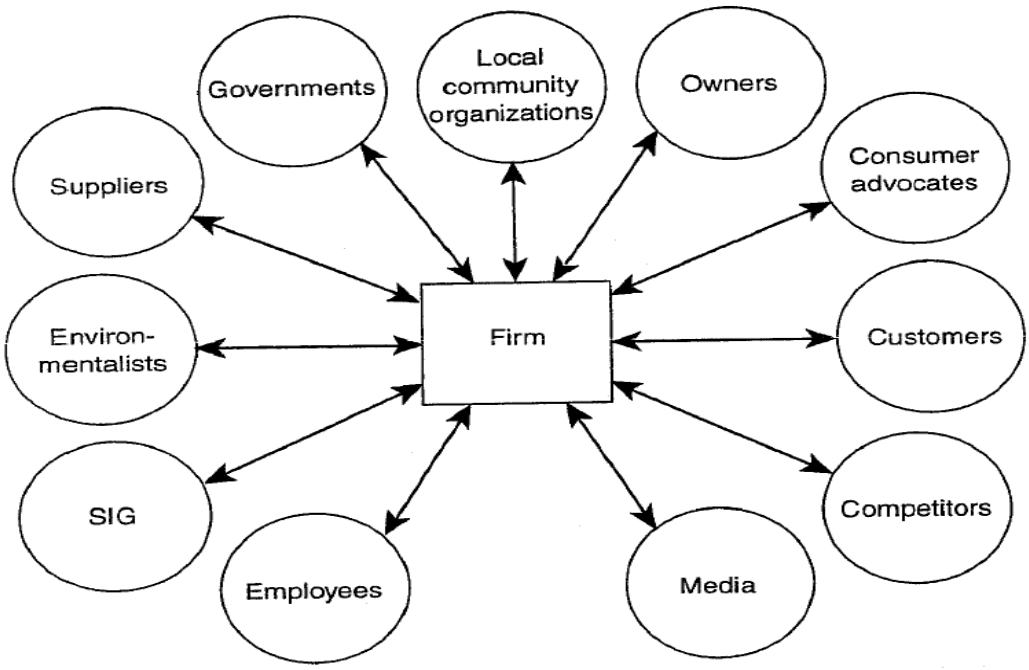
A typical map of stakeholders is shown in Figure 2.1. Stakeholders can be divided into two categories - external and internal. External pressures include regulators, public, community, and suppliers. Internal stakeholders include shareholders, management, and employees (Henriques & Sadorsky, 1996 p.384). In another categorisation, stakeholders are divided into primary and secondary. The former refers to those who are critical to the company's existence and activities, in which are included stockholders, creditors, suppliers, customers, competitors, retailers and employees. The latter are those people and groups in society who are affected, directly or indirectly, by the company's activities. Local communities, federal, state, and local governments, social activist groups, media, and business support groups, are included in this category (Post *et al.*, 1999 p.10).[17]

Each stakeholder has a unique connection with an organisation, for example, stockholders have an ownership interest in the organization. Customers, suppliers, and retailers have different interests. Customers and suppliers are most interested in gaining

[17] According to Post *et al*, (1999 p.10) calling stakeholders secondary does not mean that they are less important than business's primary relationships with society. It means that they occur as a consequence of the normal activities of conducting business. Moreover, primary and secondary areas of involvement are not always sharply distinguished; often, one area overlaps with the other. For example, while the safety or environmental effect of a product (e.g., an automobile) is a primary concern to a customer, the cumulative effect of the use of the product may represent a secondary safety or environmental concern for the entire community.

fair value in the exchange of goods and money. Governments, public interest groups, and local communities wish to protect the environment, assure human rights, or advance other broad social interests (Post *et al*., 1999 p.12).

Figure 2.1: ***A Typical Stakeholder Map***



Source: Exhibit 1.5 (p.25) -.Freeman, R. E. (1984). *Strategic management; a stakeholder approach*. Boston: Pitman

2.6.3 Stakeholder Power

Each stakeholder has different interests in an organisation and how their interest will be entertained by an organisation largely depends on their power. Stakeholder power, simply means the ability to use resources to make an event happen or to secure a desired outcome (Post *et al*., 1999 p.11). The three types of stakeholder power are; voting power, economic power and political power (Post *et al.*, 1999 p.12). Voting power means the stakeholder has the legitimate right to cast a vote. For example, each stockholder has a voting power proportionate to the percentage of the company's stock he or she owns. Through the exercise of intelligent voting, stakeholders may influence company policy. Customers, suppliers, and retailers have economic power. Suppliers can withhold supplies or refuse to fill orders if a company fails to meet its standard. Customers may refuse to buy a company's products or boycott products if they believe

the goods are too expensive, poorly made or unsafe. Governments exercise political power through legislation, or lawsuits, while ENGOs and local communities exercise political power, using their resources to pressure the government to adopt new laws or to take legal action against a company (Post *et al.*, 1999 p.12).

While power is a crucial variable in a theory of stakeholder-manager relations, power alone does not help to fully understand the importance of the relationship. In answering Freeman's calls for 'The Principle of Who or What Really Counts', Mitchell, Agle and Wood (1997) suggested that managers' perception of three key stakeholder attributes are: (i) power to influence the firm; (ii) legitimate relationship with the firm and (iii) urgency of claim on the firm. Apart from power, Mitchell *et al.* believed legitimacy and urgency also play their part. They defined legitimacy as: '[A] generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs' (Mitchell *et al.*, 1997 p.865). Mitchell *et al*. (1997 p.861) argued that there is an emphasis on the legitimacy of a claim on a firm, based upon contract, exchange, legal title, legal right, at-risk status, or moral interest in the harms and benefits generated by companies' actions. Power and legitimacy are distinct attributes that can combine to create authority - legitimate use of power (Mitchell *et al.*, 1997 p.866). Additionally, an element of urgency is vital. Urgency is the degree to which a stakeholder's claim calls for immediate attention. It adds a dynamic component to the process (Mitchell *et al*., 1997 p.864).

On the other hand, Frooman (1999 p.191-205) goes one step further and argues that power possessed by stakeholders depends not only on the resources they control but also their ability to use their resources. He develops a typology of resource relationships between a firm and its stakeholders (Table 2.1). Altogether, there are four typologies of relationship between stakeholders and a firm: stakeholder power, firm power, low and high interdependence. Stakeholder power occurs when the stakeholder is less dependent on the firm than the firm is on the stakeholder (*Stakeholder Power quadrant*). On the other hand, firm power occurs when the stakeholder is dependent on the firm, but the firm is not dependent on it (*Firm Power quadrant*). The other two quadrants refer to interdependence between stakeholder and a firm, either both parties are highly dependent on one another or both parties are not dependent on each other. In a high level of interdependence neither party could have replaced each other easily or quickly.

Table 2.1: ***Typology of Resource Relationships***

		Is stakeholder dependent on the firm?	
		No	Yes
Is the firm dependent on the stakeholders?	No	Low interdependence	Firm Power
	Yes	Stakeholder Power	High interdependence

Source: Table 1 (p.199) - Frooman, J. (1999). "Stakeholder influence strategies", *Academy of Management Review* 24(2).

Corresponding to power possessed by stakeholder and a firm, Frooman (1999 p.200-201) proposes a typology of strategies for both stakeholder and a firm in relation to resource relationship (Table 2.2). He categorises stakeholder strategies into '*usage*' and '*withholding*', '*direct*' and '*indirect*'. He presents four scenarios of resource independence. The first scenario is where the firm and its stakeholders have high resource interdependence. Under such condition, the stakeholders would be likely to use a direct strategy to put pressure on the firm's usage of the resources. For example, in the forestry industry, furniture manufacturers have worked with suppliers to implement certification standards. Under the second scenario - stakeholder power - stakeholders control critical resources but are not in turn resource dependent on the firm. In this scenario, stakeholders would be more likely to use a direct strategy to withhold resources from the firm. For example, regulators can revoke a forestry company's licence to operate on the government lands. In the third scenario, when the firm and the stakeholders have no resource interdependence on each other, the stakeholders would be likely to exercise indirect strategies via other stakeholders to either influence usage of resources that the other stakeholder holds, or influence the other stakeholder to withhold the resource from the firm altogether. For example, ENGOs can lobby local authorities not to renew leases or licences to logging companies. In the fourth scenario, the stakeholder group is resource dependent on the firm but the firm has no resource dependence on the stakeholder group. Hence, stakeholder strategy is indirect on usage, where the stakeholder looks for other powerful stakeholders as allies and poses threats to the firm to behave ecologically. For example, contract employees ally with the authorities to ensure their welfare is looked after by their employers.

Table 2.2: ***Typology of Influence Strategies***

		Is stakeholder dependent on the firm?	
		No	Yes
Is the firm dependent on the stakeholders?	No	Indirect/withholding *(low interdependence)*	Indirect/usage *(firm power)*
	Yes	Direct/withholding *(stakeholder power)*	Direct/usage *(high interdependence)*

Source: Table 2 (p.200) - Frooman, J. (1999). "Stakeholder influence strategies." *Academy of Management Review* 24(2).

The recent studies by Sharma and Henriques (2005) and Hart and Sharma (2004) support the need for a firm to dynamically engage its stakeholders so as to systematically identify, explore and integrate their views and keep its business continuously on the sustainability path. Additionally, Hart and Sharma (2004 p.10) and Sharma and Henriques (2005 p.161) argued that even an individual group, a 'fringe stakeholder', such as poor and illiterate group, may not have the power to affect the firm on its own, but it has the ability to self-organise, spread its views using the internet, and find common grounds with other stakeholders.. For instance, the multinational chemical company, Mosanto in 1999 stopped commercialising the seed sterilization technology of genetically modified seeds due to the protests of millions of small farmers in India (Hart & Sharma, 2004 p.7).

2.6.4 Environmental Stakeholders

Traditionally the main focus of stakeholder interest has been upon the financial performance of a company. Indeed, the word stakeholder is in one way or another related to stockholder. Increasingly, however, stakeholder pressure is concentrating on the environmental performance of the company (Welford & Gouldson, 1993 p.7). The following section looks at how and to what extent such pressure is applied.

2.6.4.1 Environmental Regulators

The main impact of government on the environmental performance of industry has been through the development of environmental legislation to control the use of products, processes and wastes (Welford & Gouldson, 1993 p.7). Government is also responsible for authorising regulators to enforce regulations - a form of coercive power over

businesses. The potential risks for businesses associated with environmental regulators are (i) unacceptable process and product impacts due to regulatory changes; (ii) non-compliance penalties; (iii) product elimination and substitution; and (iv) ban on, or restriction of raw materials (Henriques & Sadorsky, 1996 p.384). The threat of legal action is often the most important influence upon a company's decision to improve its management procedures (Madsen & Ulhoi, 2001b p.77; Welford & Gouldson, 1993 p.18; Banerjee, 1998 p.151).

Government regulation is necessary due to externalities and imperfect environmental information in the market. The former arise when the production of a product results in environmental costs, in the absence of regulation are unlikely to be borne by the producer. The latter happens when workers or consumers may be unaware of the health hazards associated with various occupations or consumer products. They will be unable to trade off higher risks for either higher wages or lower prices in an informed way so that the unaided market would not necessarily result in either the right amount or the correct distribution of risk (Henriques & Sadorsky, 1996 p.381).

Over the three decades, environmental laws have proliferated and so has the regulatory burden on companies. For example, form the 1970s to early 1990s over 250 environmental laws and regulations were initiated in Germany (Hopfenbeck, 1992 p.241). In the US, over half of the US$100 billion of the country's spending on environmental protection annually is borne by industry (Banerjee, 2001 p.504). Overall, the impact of environmental legislation on the operation of industry has been profound and is set to become ever tougher in the future (Welford & Gouldson, 1993 p.7). In Australia, severe penalties were imposed under the New South Wales Environmental Offences and Penalties Act 1989 and those found guilty will be fined up to A$1.00 million and face possible jail sentences for culpable directors and officers (Gunningham, 1994 p.122). Therefore, if businesses continue to take an antagonistic position on regulations, they will continue to be burdened with ever increasing regulations (Shrivastava, 1993 p.37). In parallel with the development of environmental legislation, developed countries' governments are applying MBIs together with CAC to achieve environmental objectives. These instruments have been discussed in previous sections. Through such a combination, governments seek to accelerate the structural change to improve environmental efficiency (Welford & Gouldson, 1993 p.7). Good

legislation, according to Porter and van der Linde (1995b) encourages environmental innovation for businesses, and in turn results in productivity and competitive advantage.

Apart from the direct impact of the government through its legislative measures on businesses, another role played by the government is in terms of green consumerism, by providing consumers with the information necessary to make an informed choice in the environmental performance product, for example the introduction of the EC's eco-labelling scheme in 1993 in the UK (Welford & Gouldson, 1993 p.8).

Meanwhile, many developing countries have instituted pollution-control systems, which are similar at least on paper to those in developed countries. Many developing countries' environmental legislations were established in the 1970s based on developed countries' model. CACs have been nearly universal, with considerable cross-country variation in reliance on instruments such as effluent concentration standards, volume standards, and mandated installation of pollution control equipment. Also, there has been a great variation in the strictness of monitoring and enforcement of regulations (Hettige, Huq, Pargal, & Wheeler, 1996 p.1892). Some examples of environmental regulatory challenges in developing countries, especially in Asia, will be discussed at length in Section 2.8.

2.6.4.2 Customers

Consumers are increasingly better informed and more aware of the environmental impact of products, and may demand businesses improve their environmental performances (Williams, Medhurst, & Drew, 1993 cited in Buysse & Verbeke, 2003 p.459). Apart from governmental regulation, consumers' pressure has often been cited as an important factor contributing to business environmental commitment (Henriques & Sadorsky, 1999 p.87). Consumer groups may exert pressure by boycotting the products of environmentally unfriendly businesses (Buysse & Verbeke, 2003 p.459). A 1993 survey by MORI in the UK indicated that 22 per cent of the public claimed to avoid using the services or products of a company which they consider has a poor environmental record (Townsend, 1998 p.71). There are no shortages of examples. An international oil company, Shell in Germany, experienced reduction in petrol sales when customers opposed the sinking of the Brent Spar platform in the North Atlantic in 1995

(Schaltegger, Burritt, & Petersen, 2003 p.43). The McDonald's corporation needed to change their packaging for several products after years of complaints from customers (Banerjee, 2001 p.505). In Australia, a study conducted by Blaikie and Ward (1994, cited in Townsend, 1998 p.71) found that there is a significant proportion of people who choose to avoid environmentally damaging products.

Welford (1994b p.8) highlighted the fact that customers through their buying behaviours support environmentally friendly products. The new green products which were introduced to respond to increasing green consumers increased from 1.1 per cent in 1986 up to 13 per cent 1991 in the US (Ottman, 1993, cited in Banerjee, 2002a p.180). Additionally, the emergence of green consumerism implies that some consumers are willing to pay a price premium (Sandra & Oliff, 1990 p.11). In the US, consumers would be willing to pay up to 20 per cent more for environmentally friendly products (Salzhauer, 1991p.10). Green consumerism may also drive the transition towards more proactive environmental management, particularly in industries that have close contacts with final consumers (Arora and Cason, 1995, cited in Buysse & Verbeke, 2003 p.459). Goods such as washing detergents and certain types of packaging attract significant environmental concern, while clothing and computers, remain less susceptible to green marketing (Perry & Singh, 2002 p.127). Customers' pressure not only forces businesses in the home countries to produce products environmentally but also forces businesses in foreign countries to do so. Christmann and Taylor (2001) showed customers in developed societies influenced companies in China to adopt the ISO 14001 standard.

While more and more customers are more environmentally conscious, at present, the influence of green consumerism on most businesses is rather marginal. Many are not willing to pay a premium price for environmentally friendly products. In other words increasing concerns towards environment is by no means reflected in purchasing of such products. Of the myriad of products that each consumer buys, very few are chosen on the basis of their environmental credentials alone. Quality, competitive prices and environmental credentials come in a package in current products. A study by McDougall (1993) found Canadian consumers will pay more for green products, however the quality must be maintained.

In contrast to developed countries, in general, developing countries' businesses are operating in business environments that rarely reward environmentally friendly products (Jeppesen & Hansen, 2004 p.268). The customers' low disposable incomes force them to fulfil their lower basic needs rather than demanding green products which are considered as in the higher hierarchical needs. Sethi (1994, cited in Reed, 2002 p.189) argues that two key differences in circumstances have tended to define the situation of developing countries. On one hand, consumer markets have often been non competitive, especially in cases where the governments have sought to protect domestic producers from foreign competition. The lack of competitiveness not only results in high prices and a limited range of products and producers, but also affects the quality and safety of goods as well as a relative paucity of information about the goods. Moreover, consumers are often less able to make informed choices about products due illiteracy and inadequate formal education, and a lack of necessary resources. However, Sethi's argument is open to question, since the burgeoning middle class customers over several decades in developing countries has resulted in increased demand for more environmentally friendly products. For example, two populous countries - China and India - since the late 1980s have resorted to opening up their economies to allow FDI and the importation of foreign goods (Hansen, 2003 p.32).

2.6.4.3 Suppliers and Distributors

The environmentally friendly business does not exist in vacuum, instead it relies upon suppliers and distributors to operate to an acceptable environmental standard. As Peattie (1992, cited in Roberts, 1995 p.23) argued, it is likely that the environmental performance of any company will, in part, be predetermined by companies further back down the supply chain. In the case of pressure from suppliers and distributors, a company may be faced with the risks of (i) hazardous waste liability and (ii) distributor boycotts, and stop delivering inputs to protect their own reputation (Henriques & Sadorsky, 1996 p.384; Henriques & Sadorsky, 1999 p.89).

In their efforts to improve overall environmental performance, environmentally conscious companies are exercising their own rights. As purchasers they are demanding that all of the companies within their supply chain seek to minimise their own environmental impact. Hence, demands to improve environmental performance at all

stages in the supply chain are being diffused beyond those companies. Such a practice is discussed under various headings such as 'greening the supply chain', 'responsible environmental chain management', 'life cycle analysis', 'product re-design' and 'eco-labelling' (Welford & Gouldson, 1993 p.9).

However, at present, a small number of suppliers and distributors are environmentally conscious. For example, based in Canada, Tembec is an integrated forest products company involved in the production of wood products, market pulp and papers. It manages 32 million acres of Canadian forest, and is an industry leader in obtaining Rainforest Alliance (SmartWood) FSC certification. In July 2004, Tembec signed an unprecedented agreement with the Ktunaxa Nation to promote a sustainable working relationship with the local tribes. Not only does the agreement define a process for consultation, it is also a key aspect of the forest management certification awarded to Tembec in 2004 by the Rainforest Alliance's SmartWood Program for a 372,000 acres tract within traditional Ktunaxa-Kinbasket First Nations lands (Sustainable Business.com, 2005). As a result of increasing pressure by various stakeholders an increasing number of developed countries' distributors have set environmental standards towards their business partners. The standards imposed may vary from shallow environmental collaboration, with little transfer of resources to deep environmental collaboration, with significant resource transfer to the local company (Jeppesen & Hansen, 2004 p.263). In the furniture industry, IKEA has placed considerable emphasis on monitoring suppliers. It has developed different manuals and guidelines, outlining the requirements that suppliers need to comply with and supporting the suppliers in drafting an action plan. IKEA also supplies new machinery and technical support to its suppliers (Jeppesen & Hansen, 2004 p.264).

Nonetheless, it should be noted that high environmental capabilities are rarely the sole, or dominant, criteria for obtaining supplier status; rather, buyers see environmental capabilities as a proxy for a strong organisation, quality orientation and ability to deliver according to schedule (Jeppesen & Hansen, 2004 p.271).

2.6.4.4 Trade Associations

Various environmental impacts such as fatal accidents, emission of toxic pollutants and other issues have bad consequences not only for the firms responsible, but also for all

firms within the same industry. Additionally, due to the collective nature of government regulation and stakeholder pressures, firms often find their reputations tied together with those of others (Lenox & Nash, 2003 p.343). In an attempt to avoid costly regulations and liabilities, trade associations, especially in developed countries, for the last two decades have promoted industry self-regulation to control collective behaviours (Lenox & Nash, 2003 p.344). These associations established codes of environmental management practice that stipulate environmental goals for industry members beyond those required by the regulations.

Among business associations, chemicals industry associations proactively promote industrial codes to counter the moral indifference of their industry (Howard, Nash, & Ehrenfeld, 2000 p.64). Bhopal's Union Carbide poisonous gas disaster that killed of thousands people in 1984 in India prompted the chemical industry to improve its environmental management as well as its image. In the US, the American Chemistry Council (ACC) was the first US trade association that developed an industry self-regulation initiative. The association adopted the Responsible Care programme in 1989 to improve the reputation of the chemical industry by improving the environmental performance of individual chemical firms (Lenox & Nash, 2003 p.345). The adoption of the programme was required as a condition of membership to participate in the council (Lenox & Nash, 2003 p.345). Firms will participate in self-regulation programmes when doing so provides a signal to stakeholders about a firm's quality, and stakeholders may subsequently reward firms for participation. Some insurance providers offer lower premiums to firms that adopt the codes (Lenox & Nash, 2003 p.346).

The trade associations have employed a variety of informal mechanisms to encourage compliance with their programme requirements. First, a number of trade associations convene meetings to share implementation experiences among their members. Such meetings offer vast opportunities for the members to compare their commitments and impose pressure on managers of firms that are falling behind. Second, they may also organise conferences and workshops in which members address their progress in environmental auditing, EMS and crisis management. The conferences and meetings convened by the trade associations provide a venue for individual firms to exert peer pressure on one another for compliance with the codes.

While some firms will join with the intent of meeting programme objectives, others may join to mask their poor performance. Without effective mechanisms for measuring and enforcing compliance with programme objectives, the effectiveness of voluntary programmes to ensure firms comply with the programmes based on involuntary sanctions is questionable. Only when self-regulatory programmes have explicit sanctions or expulsions for malfeasance may they avoid attracting more polluting firms (Lenox & Nash, 2003 p.353). By and large, due to lack of power of trade association to take action against their members, coupled with company participation as members being voluntary in nature, up until today trade associations have been considered as exerting weak stakeholder pressure on businesses to embrace environmental issues.

2.6.4.5 Local Community

Any business shares its surrounding environment with the local community. The Longman Dictionary of Contemporary English (1995 p.271) describes community as people who live in the same area or town. However, according to Daly and Cobb (1989 p.172) communities are not simply groups of people occupying patches of land or residing in the same geographic area, they are complex social systems composed of diverse individuals and organisations. Although communities usually share a common geography, the essence of a community lies primarily in the complex cognitive networks that form around the values and expectations of the both individuals and organisations that comprise it (Welford, 1995 p.138).

Increasingly this community is demanding a high level of environmental performance from its industrial neighbours, and seeks some degree of reassurance that they are not exposed to environmental risk due to a company's operations (Welford & Gouldson, 1993 p.9). Trends towards freedom of access to environmental information will give greater power to local communities when they question the activities of local industrial co-habitants. In order to foster a positive working relationship, companies must improve their environmental performance and communicate this to the surrounding communities (Welford & Gouldson, 1993 p.9). The community can exert significant pressure on businesses via (i) their influence on the legislative process and their buying patterns, (ii) shutdown of future development, (iii) environmental activism within ENGOs and (iv) third party and citizen suits (Henriques & Sadorsky, 1996 p.384).

Thus managers should also be aware that a community's survival depends on business organisations that contribute to a viable economy. Organisations can prosper over the long run only if the community can maintain a balance between a healthy environment and ample opportunity for human development and fulfilment in ethical and healthy economic activities. Accordingly, the organisation that values its community is likely to benefit from numerous economic advantages such as customers loyalty, positive public image and employee commitment as well as contributing to the protection of the environment (Welford, 1995 pp.138-139).

But, not all communities apply the same level of pressure on an organisation. Communities with larger minority populations, lower incomes and less education are at a disadvantage and tend to experience environmental problems (Delmas & Toffel, 2004). On the contrary, communities which are characterised by higher voting rates, membership in environmental interest groups, and household income are likely to exert more pressure on businesses (Delmas & Toffel, 2004 p.214). In relation to this, Khator (1991, cited in Hettige *et al*., 1996 p.1895) used several case studies to illustrate ways manufacturing plants have responded to various community pressures in India. In some instances, plants reduced their emissions by installing new treatment facilities. In other instances, they compensated the community by providing drinking water or new facilities such as temples. Some plants, however, refused to address the pollution problem. The author noted that directly affected communities were usually the first to react to industrial pollution problems. But villagers' ability to organize and modify polluters' behaviour is often limited, due to a high illiteracy rate, lack of resources, or lack of influence over government officials. The same situation was also observed by Pargal and Wheeler (1995 p.18) in Indonesia; they found that plants located in poorer, less-educated community areas had a water pollution intensity that was 15.4 times more than plants in relatively affluent and well-educated communities.

Overall, local communities in developing countries tend to be characterised by three key differences in circumstances vis-à-vis those in developed countries. First, they tend to be more vulnerable to industrial accidents, dispossession from traditional lands and resource depletion. Such vulnerability is rooted in the smaller material capacity that they have to anticipate and respond to such phenomena, and a lesser ability to influence governments to address the results of such activities. The second and third factors tend

to be closely related. On one hand, local communities tend to have different cultural values and lifestyles. On the other hand, local, especially rural, communities tend to be less integrated into the market economy. The latter differences may mean that such communities are more adversely affected by corporate marketing and advertising campaigns (which promote a consumer society) because these strategies tend to challenge traditional values and lifestyles. Typically, governments have been rather slow to intervene in such situations to protect the interests of local communities and/or help ease the transition into a market economy (Reed, 2002 p.193).

2.6.4.6 Employees

Employees are central to any discussion about organizational stakeholders. First they want a better salary and career opportunity, but with increasing knowledge of their rights, they want to work in a safe and clean environment. They are often the first to either suffer or benefit from the economic, social, and environmental performance of the firm. Employees consist of diverse groups of people whose interests and activities extend beyond their jobs; they are also members of activist groups, professional groups and trade associations. As such, they often have an influence on or are influenced by the actions of the organization (Stead & Stead, 2004 p.96). Employee rights are seen as employees' legitimate and enforceable claims to some desired treatment, situation, or resource (Stead & Stead 2004 p.97). The risks that employees place on businesses occur when: (i) accidents arise due to a lack of training awareness and (ii) non-commitment by top management increases the probability of whistle-blowing. Companies that reflect the environmental concerns of the public will find it easier to attract, retain and motivate quality workforce (Welford & Gouldson, 1993 p. 9).

Among employees, middle and top managers play important roles in exerting pressure on the organisation since they are responsible in developing and implementing environmental strategies within their organisation (Banerjee, 1998; Banerjee *et al.*, 2003). The higher the commitment of top management, the more proactive the environmental strategies of the organisation would be. Hence, those who manage to get access to and attention of top management would be more successful in influencing a firm's strategy to behave in an environmentally responsible manner (Agle, Mitchell & Sonnenfeld, 1999).

Broadly speaking, the key circumstance with respect to employees in developing countries is characterised by the very weak labour market. High levels of unemployment, a relative inability of labour to represent its interests and a disproportionate representation of various social groups are common problems faced in these countries. Among such under- represented groups are women, indigenous peoples, people of lower social and/or religious status (lower castes) (Reed, 2002 p.188). Another aspect of the situation of employees in developing countries is the inadequacy of their government's efforts to legislate and enforce appropriate labour standards and rights. These circumstances result in a variety of unacceptable practices with respect to compensation, health and safety issues, and the use of child labour (International Labour Organisation, 1999 cited in Reed, 2002 p.188).

2.6.4.7 Shareholders

Shareholders are the legal owners of business corporations (Post *et al*., 1999 p.290). Traditionally and up until now, shareholders' main interest is a good return on their investment, and they tend to look for short term rather than long term investment return and rely heavily on a business's past performance such as profit, earning per share, profit margin, return on investment and cash flow. In order for businesses to compete for finance they need to persuade shareholders about the economic prospects of success and security associated with any financial commitment (Schaltegger *et al*., 2003 p.87).

Over the past two decades, apart from a return on their investments in monetary terms, there has been increasing demand from shareholders to invest in socially and environmentally responsible businesses (Aslaksen & Synnestvedt, 2003 p.212). The pressures that shareholders exert over a company arise as a result of (i) discontent with environmental fines which lower profits, (ii) disillusionment with progress towards environmental goals, and (iii) difficulties in raising new capital or attracting new investors (Henriques & Sadorsky, 1996 p.384).

Although the increasing number of environmentally conscious shareholders, their pressure on business to be more socially and environmentally responsible is nothing new. According to Brancato (1997, cited in O'Rourke, 2003 p.229) US shareholders have been pressuring companies to address social issues through the proxy voting

process since the 1940s. But calls for improved corporate social and environmental responsibility resurged in the early and mid 1990s, stimulated by dramatic incidents of malpractice and rising public pressure on environmental issues (O'Rourke, 2003 p.229). At present, a growing number of individuals, mutual funds and pension funds screen businesses, weeding out ones that pollute the environment, discriminate against their employees, or make dangerous products like tobacco or weapons. Such an investment is called a Socially Responsible Investment (SRI), referring to the practice of screening investment alternatives based on social, and environmental performance criteria (Stead & Stead, 2004). The total SRI in the US was estimated at the US$2.340 billion in 2001 (Scholtens, 2005 p.13). In Europe about 300 mutual funds are managed according to sustainability and social responsibility (Koellner, Weber, Fenchel, & Scholz, 2005 p.54). In the Netherlands, the Green Project Facility (GPF) was established in 1995 to promote the access to finance for environmentally sound projects; its size grew from €880 million in 1997 to more than € 1 billion in 2002 (Scholtens, 2005 p.131).

SRI had also gained momentum in Asia. Some SRI funds available in Japan, Hong Kong and Singapore. In Japan, Nikko Eco Fund collected more than $2 billion in six months after the launch (in August 1999), companies dramatically became environmentally conscious and some contacted the fund to provide their environmental reports. The Nikko Eco Fund's top holdings include carmaker Toyota, mobile-phone operator NTT DoCoMo and photographic film manufacturer Fuji Film (Chung, 2001).

Another mechanism that is being used by shareholders to exert influence on businesses to be more environmentally and socially conscious is through shareholder activism. In shareholder activism, shareholders are more proactive in influencing corporate behaviour by exercising ownership rights – either by preparing and / or voting on shareholder proposals, or by entering into dialogue with companies directly on social and environmental issues. Their pressure on businesses may include selling shares in response to social and environmental issues, preparing and lodging shareholder resolutions, voting on proposals and corporate engagement dialogue (O'Rourke, 2003 p.228). Some NGOs buy shares just to vote or launch campaigns. NGOs are lobbying other large and small shareholders on social and environmental issues. Their drivers may include the extension of existing of campaigns, a broader and more influential arena in which to raise issues, increasing media exposure potential, the formation of

coalitions between ENGOs and other investors, and stronger connections being made between their own sources of funding and their campaigns (O'Rourke, 2003 p.228).

Despite an increasing number of shareholders interested in SRI funds, their numbers are relatively small compared to ordinary funds. While the US market is by far the most developed market for SRI among developed countries, its socially responsible investment in relation to total investment in 2001 was only about 2.2 per cent. In other developed countries like Switzerland, Belgium Netherlands, Canada and the UK, these investments were between 1 to 1.5 per cent, in Italy, France and Germany less than 0.5 per cent (Scholtens, 2005 p.130). Though SRI has made inroads in Asia, it is limited only to Japan, Hong Kong and Singapore, and Asia has yet to acquire a social index of its own. Overall it is true to say that social and environmental issues are still outside the domain of most shareholders in both developed and developing countries.

2.6.4.8 Financial Institutions

Financial institutions are stakeholders with a tremendous influence on organisations. Most business activities simply cannot survive without sufficient financial backing. The fundamental objective of financial institutions is to maximize the expected rate of return on their investment portfolios (Koellner *et al.*, 2005 p.54). In order to ensure their clients are capable of fulfilling their obligation, financial institutions look at financial statements of their clients. Traditionally, whatever types of investment their businesses are involved in and how they run their businesses, either environmentally acceptably or not, is beyond the domain of their business. Due to the nature of their business, financial institutions are considered as a low environmental impact industry. Their products themselves do not pollute the environment, rather it is the users of their products who can have a considerable impact on the environment (Jeucken, 2001 p.63).

In the recent years, they are beginning to seek beyond the financial aspects of their investments to incorporate environmental and socio-economic criteria. Financial institutions that finance irresponsible business will be exposed when interest groups scrutinize the financiers of these businesses much more closely (Jeucken, 2001 p.65).

Moreover, new environmental protection regulations and more stringent rules on liability, particularly in the US as well as developed countries, have led to an environment-related increase in the costs and risks associated with lending (Schaltegger & Figge, 2000 p.36). Environmental problems bring the potential for legal liability, financial liability, property damage, and property loss to financial institutions. For this reason, a handful of financial institutions began to require environmental audits (Schaltegger & Figge, 2000 p.36). For example, the UK bank, Lloyds TSB has developed techniques for taking environmental risk into account in business lending (Deni Greene Consulting Services, 2001 p.9).

The financial institutions that impose environmental conditions are less willing to finance environmentally risky projects, especially in the wake of court decisions that often make current owners responsible for environmental problems created by previous owners (Stead & Stead, 2004 p.100). As a result, companies which cannot demonstrate a high level of environmental performance will find it difficult and expensive to attract and retain investment and insurance (Welford & Gouldson, 1993 p.10). But, as with shareholders, at present only a small number of financial institutions look at their clients' environmental records and / or projects they are involved in.

2.6.4.9 Environmental Non Governmental Organisations (ENGOs)

The primary purpose of ENGOs is to promote social and environmental goals, rather than the achievement or protection of economic power in the marketplace, or political power through the electoral process (Murphy & Bendell, 2001 p.291). They have grown in numbers, power and influence since 1980s (*The Economist, 29 January*, 2000) and their activism has been responsible for major changes in corporate behaviour and the government's action (*Living with the enemy*, 2003). Many ENGOs - Greenpeace, Friends of the Earth (FoE) and World Wildlife Fund for Nature (WWF) - are international organizations with national bases in many countries across the world. The WWF has been involved in over 4,000 projects in 140 countries since its foundation in 1961, while Greenpeace has over 45 million members world-wide and offices in 30 countries (Hutchinson & Hutchinson, 1997 p.61). ENGOs are increasingly putting pressure on businesses and effecting corporate policies on environmental issues

(Murphy & Bendell, 2001 p.293). Generally, ENGOs influence business in three key ways:

a) Forcing change, through boycotts, direct action and lobbying

A case in point is Shell Oil Company, who used lower environmental standards in its operations in Nigeria's delta region. From 1982 through 1992, 1.6 million gallons of oil were spilled from Shell's Nigerian fields and Niger Delta communities experienced Shell's gas flaring for 30 years (Rowell, 1995, cited in Murphy & Bendell, 2001 p.296-297). Shell was also accused by the ENGOs of implicitly supporting human rights abuses, given its perceived close association with the repressive Nigerian military regime. For example, at one of the many demonstrations against the company in Ogoniland, 80 villagers were killed by the Nigerian Mobile Police Force. Furthermore, in late 1995 the government executed the leader of the movement of the Ogoni People, Ken Saro-Wiwa. The ENGOs world-wide protests, against such violent repression, finally forced the company to change its policies and practice. In 1997 Shell released its revised business principles, which included explicit support for human rights, and it published its first public report on community and environmental issues in Nigeria - established new targets, including an end to gas flaring in the delta within ten years.

Although not all ENGOs are successful in realising change in corporate policy, by putting issues on the agenda, conflict can lead to governmental intervention; for instance, the case of biotechnology in India (Murphy & Bendell, 2001 p.288-312).

b) Facilitating change

Many ENGOs are increasingly favouring cooperation over traditional protest and confrontation in order to encourage environmentally sensitive corporate practices (Stafford, Hartman, & Liang, 2003 p.122). By partnering with business, they are facilitating change in business environmental practices. The business-ENGO collaboration is not solely based on corporate philanthropy but on strategic partnerships, dealing with the internal operational issues of participating businesses. For instance, in the case of deforestation and ENGO relations with the timber trade (Murphy & Bendell, 2001 p.294-296), such collaboration has facilitated the Forest Stewardship Council (FSC) accreditation and certification for timbers that are produced according to sustainable logging practices. A further example is the Greenpeace collaboration with

Foron, a household appliances company in Germany, in 1992-1993. Initiatives taken by this collaboration led to marketing of an ozone-safe refrigerator motivating industry-wide adoption of eco-technology (Stafford *et al*., 2003).

For businesses, the reasons for collaboration fall into three broad categories (Murphy & Bendell, 2001 p.299):

- There is the management of corporate responsibility - businesses interact with and respond to ENGOs as a means of demonstrating corporate accountability and their legitimacy as power global economic and political actors.
- There is the need for corporations to manage conflict and protect corporate reputation. For reasons of marketing, recruitment, employees and risk management, it is productive to cultivate the public impression of a socially and environmentally responsible business in a society.
- Companies can access new resources by partnering ENGOs; these resources relate to credibility, expertise, marketing ideas and networking.

c) Sustaining change

The ENGOs are actually sustaining change in the marketplace by going it alone and / or establishing new trading relationships and new systems of regulation. For example in a timber trade case study, ENGOs such as WWF helped set up a new globally applicable system for the endorsement of products from well-managed forest - the FSC accreditation, certification and labelling scheme. Instead of waiting for intergovernmental regulatory agreements or better implementation of existing governmental regulations, the NGOs established their own system.

2.6.4.10 The Media

A combination of increased public awareness of environmental issues and freedom of access to information magnify media interest in business' environmental performance. A reactive environmental strategy may be confronted with negative publicity campaigns from unfavourable coverage by the media (Welford & Gouldson, 1993 p.11). In order to manage media attention, businesses should show that they make significant efforts to reduce their environmental impact. While it may be appealing to allow the public relations or marketing departments to lead the way any false claims can soon be uncovered by the media which would be very detrimental to their companies' public images. Those who seek to communicate responsible environmental performance

should base any claims that they make to this effect on hard facts which they are willing to communicate to stakeholders (Welford & Gouldson, 1993 p.10).

Over the decades since the publication of Carson's *Silent Spring* (Carson, 1962), the mass media have shifted focus from the isolated symptoms of environmental degradation towards appreciation of the underlying interconnections between environmental problems and their causes (Hutchinson & Hutchinson, 1997 p.243). Though media reporting on the issues increased in the end 1980s and reached a peak in the early 1990s in many countries, it has declined steadily after that. In the US, despite the actual high level of environmental concern, the media's environmental coverage in the early 1990s was less than two per cent (Letto, 1995 p.22; Spencer, 1992 p.14). There are some reasons why environmental issues receive less attention by the media in comparison to other issues. First, businesses put profits before anything else. Over the last three decades, newspapers' income has depended less on sales to readers and more on advertising; this has meant that newspapers have become less responsive to their readers, but become more accessible to their advertisers (Beder, 2000 p.181-182). A 1992 US study of 150 newspapers editors found that 90 per cent of respondents said that advertisers tried to interfere with newspaper content, 70 per cent said that advertisers tried to stop news stories altogether and 40 per cent admitted that advertisers had influenced a story (Beder, 2000 p.181). Not surprisingly, environmental stories in the 1990s tended to have an economic framing, focusing on the costs of environmental regulation in terms of jobs and money, instead of highlighting environmental crises resulting from business activities (Spencer, 1992 p.15).

Secondly, many media organisations are owned by MNCs who are involved in other businesses (Kellner, 1990 p.82). The owners influence the selection, shaping and framing of the news. The common mechanism of control exercised by media owners is through the appointment of editors who become the owner's voice, ensuring that journalists to comply with editorial line (McNair, 1994 p.42). In the US, General Electric (GE) ownership of NBC is a case in point. In 1987, the news station aired a special documentary promoting nuclear power in which GE had a vested interest. Using France as a model in its programme, it portrayed the French people welcoming each new reactor with open arms. But shortly after that, when accidents occurred at French

power stations and there was opposition to nuclear power among its population, NBC did not report the stories of these events (Lee & Solomon, 1990 p.78).

Thirdly, big corporations have learned that environmentalists have used the media to increase environmental awareness among the public and to put significant pressure on the government to legislate environmental regulations. Against such a strategy, they also use the media - to counter negative accusations. In the US, the major mainstream newspapers significantly downplayed scientific understanding on the impact of human activities on global warming. They portrayed global warming as a result of a natural cycle of earth temperature (Boykoff & Boykoff, 2004). Similarly, in Australia, the Australian Institute of Public Affairs (IPA), whose budget comes in part from mining companies, has also produced articles and media statements challenging the greenhouse consensus. In the IPA Review, Aaron Oakley (Beder, 2000 p.242) accused the Australian Broadcasting Corporation (ABC) of bias 'because ABC reporters made the assumption that global warming is real, some even making assertions to that end.'

As for the public, who depend on media, notably television, as a source of information, they are likely to receive distorted messages. For example due to high positive media coverage, in 1991 GE managed to receive high ratings from viewers according to a Roper poll, but lost its position in 1993, when its was identified in several magazines as one of the most environmentally unfriendly companies (Beder, 2000 p.228).

2.7 Previous Studies on Stakeholders' Environmental Pressure

The previous discussion looked at how and to what extent each stakeholder exerted influence on businesses to behave ecologically soundly. The following discussion looks at various studies on management's perception of the importance of environmental stakeholders' pressure in both developed and developing countries.

2.7.1 Developed Countries

There have been a number of studies in developed countries on management's perception towards environmental stakeholder pressures (Table 2.3, on page 63). In 1994, Welford (1994a p.156) studied stakeholders' pressures on a number of SMEs in

the UK, he found the environmental regulators were major pressures, not customers and ENGOs. Also in the UK, Fineman and Clarke's study (1996) on various industries, found that apart from regulators, ENGOs were important stakeholders, but not customers, employees and financial institutions. In Canada, a study by Henriques and Sadorsky (1996) found that regulators, shareholders, customers and community were the major environmental stakeholders. A further study by Madsen and Ulhöi (2001b) in Denmark, found regulators, customers, shareholders and employees were the major environmental pressure, but not ENGOs and financial institutions. In the same year, in the UK, Harvey and Schaefer (2001) investigated the role of regulators, customers and shareholders in influencing environmental practices in water and electricity industries, and found only regulators as high threats. However, Halkos and Evangelinos' study (2002) in Greece found regulators, employees, ENGOs and customers to be the major environmental stakeholders. A recent study by Lefebvre, Lefebvre and Talbot (2003) on SMEs in the various industries in Canada, found both regulators and pressure group were important stakeholders. On the other hand, Banerjee, Iyer and Kashyap's (2003) study, investigated the role of regulators, top management, employees and community as environmental stakeholder pressure on the various industries in the US. They found that all these stakeholders played an important role in environmental terms. A very recent study by González (2005) on Spain's pulp and paper industry showed that the three major environmental stakeholder pressure groups were regulators, ENGOs and employees. But, among employees only managers were identified as major pressure group. Customers, shareholders, competitors and financial institutions were found to be only minor players.

Overwhelmingly, the studies showed environmental regulators as the most important stakeholder pressure (Table 2.3). To a lesser degree, employees (notably the top management) as well as the community were also major environmental stakeholders. On the contrary, financial institutions were generally a weak pressure group. Customers, shareholders and ENGOs showed as having rather mixed pressure. In some studies, they were shown to be high pressure groups, but weak in some other studies. Nevertheless, many of these studies did not include suppliers, distributors, competitors, and media, so no comparison of their pressures can be made with other stakeholders.

Table 2.3: ***Studies of Management's Perceptions towards Stakeholders' Pressures in Developed and Developing countries***

AUTHOR / COUNTRY	INDUSTRY	Customer	Supplier & Distributor	Share-holder	Regulator	Employee	NGO	Competitor	Financial Institution	Community	Head-quarter	Media	Association
i) Developed Countries													
Madsen & Ulhoi, 2001b, Denmark	Manufacturing	●		●	●	●	○		○				
Henriques & Sadorsky, 1996 Canada,	Various Industries	●		●	●		○			●			
Lefebvre *et al.* 2003, Canada	Wood , printing, metal & electrical				●		●						
Fineman & Clarke 1996, UK	Supermarket, automotive Power, chemicals.				●	○	○		○				
Halkos & Evangelinos 2002 Greece	Various Industries	●			●	●	●						
Harvey & Schaefer, 2001, UK	Water & Electricity	○		○	●								
Gonzalez, 2005, Spain	Pulp & paper	○		○	●	●	●	○	○				
Welford, 1994a, UK	SMEs Manufacturing	○			●		○			○			
Banerjee, Iyer & Kashap, 2003, USA	Various Industries				●	●				●			
ii. Developing Countries													
Rao, 2000, South-East Asia	Various Industries	●	○	●	●	●	●	○	○	●		●	○
Pratt and Fintel 2002, Costa Rica & El Salvador	Various Industries	○		○	●								
Steger, Zhaoben and Wei, 2003, China	MNCs various industries				●	○				○		○	
Hansen, 2003, China, India & Malaysia	MNCs Various Industries	○			○	○	○				●	○	
Xian and Zhang 2000, China	MNCs various industries	○			○	○	○				●	○	
Pedersen, 2000, Malaysia	MNCs various industries	○			○	○	○				●	○	○

● Major Pressure Group ○ Low Pressure Group

2.7.2 Developing Countries

There were a number of empirical studies of environmental stakeholders' pressure on businesses in developing countries (Table 2.3). All of these studies were quite recent. Pedersen (2000) studied environmental management of the MNCs in Malaysia, and he found the only important stakeholders were the companies' headquarters in their home countries - the US, Europe and Japan. Other stakeholders - customers, local regulators, employees, ENGOs - were only minor stakeholders. As with Pedersen (2000), another study of MNCs by Xian and Zhang (2000) in China also produced the same results. In contrast, a study by Rao (2000 p.53-74) on large local industries in the Southeast Asian countries found a heavy influence of the regulators, customers, shareholders, employees, ENGOs, media, and community, but not suppliers, competitors, industry associations and financial institutions. Meanwhile, in 2003, Hansen (2003) in his study of the MNCs in China, India and Malaysia found only the headquarters of these companies were important environmental stakeholders, but not the other stakeholders. Hansen's findings seemed consistent with those of Pedersen (2000) and Xian and Zhang (2000). In a further study in China, Steger, Zhaoben and Wei (2003) showed that environmental regulators and government officers were two important stakeholders, but not others stakeholders. The same result is also observed in a study by Pratt and Fintel (2002 p.45) in central America - legislators were the only significant stakeholders.

The studies of developing countries can be divided into two categories. The first constitutes those studies where their samples were from local companies, and the second constituted MNCs. As far as the former is concerned, studies by Rao (2000), Pratt and Fintel (2002) and Stegar *et al*. (2003) clearly showed that regulators were the most important environmental stakeholders pressure group. In the latter, studies by Hansen (2003), Xian and Zhang (2000), and Pedersen, (2000) found that regulators were considered as a weak pressure group. Instead MNCs' headquarters were considered to be the major environmental stakeholders. Their environmental policies, procedures and standards (dictated by their stringent environmental policies at home countries) have already surpassed the host country's standard, local regulators were not considered as a powerful pressure on them.

On the other hand, the results for other stakeholder groups are rather mixed. In Rao's study (2002) customers, shareholders, employees, ENGOs, media and community were all major stakeholder pressure groups. But others studies (Hansen, 2003; Pratt & Fintel, 2002 and Pedersen, 2000) did not show these stakeholders to be as powerful. The results of Rao's study (2000) raises further question as these stakeholders were found to be powerless in other studies in developing countries.

2.7.3 Comparison of Environmental Stakeholders' pressures between Developed and Developing Countries

Comparing the two types of countries, a number of observations can be made. In terms of similarities, first, (with the exception of MNCs in developing countries) regulators were largely considered as the most important in terms of environmental stakeholders' pressure. Communities and suppliers were also found to be important pressure groups, though to a lesser degree. As for the case of financial institutions, all studies in both country groupings showed that they were weak stakeholders. In terms of differences, it is observed that pressure from shareholders, customers, employees and ENGOs was rather mixed in developed countries. Some of the studies found they were major pressure groups and other studies found there were minor pressure. In contrast, the majority of studies in developing countries - except study by Rao (2000) - showed that these stakeholders were weak pressure groups. This finding indicates that unlike developing countries (the environmental regulators were the single important stakeholder) in developed countries other kinds of stakeholders seem likely to apply important pressures. Though regulators are considered a powerful threat in developing countries as in developed countries, this result cannot be accepted at the face value. The following elaborates on problematic environmental regulations in developing countries.

2.8 Challenges of Environmental Regulations in Developing Countries

In developed countries, environmental quality monitoring is compulsory and the monitoring of the quality of environment is done on a regular basis (Lovei & Weiss, 1998 p.18). Quite the opposite is so in developing countries. Though a detailed set of performance standards frequently exists on the books, monitoring and enforcement of these has generally been weak (Utting, 2002). This is due to a number of reasons.

Firstly, the lack of staff in environmental agencies. In Thailand, there are only a few hundred industrial-pollution control officers to inspect over 50,000 establishments. When numbers of inspectors are increased, there is inadequate training (O'Connor, 1994 p.14). Similarly, in China, the number of employees of the State Environmental Protection Agency doubled between 1985 and 1995 to 88,000 people. But it was difficult to maintain the performance of staff as salaries were eaten away by inflation, which in turn could expose them to corruption (Vermeer, 1998 p.955). Secondly, governments in the developing countries have relied principally on CAC (Egbu, 2000 p.15), through legal enforcement of performance standards. Since the sole onus of environmental monitoring relies on environmental regulators, effective monitoring under this approach is quite costly. Meanwhile, since there is no economic incentive for being environmentally proactive from the authority, businesses have no motivation to establish proper environmental objectives within their corporate policy. Finally, monitoring is complicated and cumbersome due to overlapping of duties between relevant agencies. In Nigeria, state controls and a national agency responsible for pollution control and management, the two-tier control prevents effective management (Egbu, 2000 p.15). The same might be said in China; the state environmental authority has continued its pressure for more environmental policies, but its powers have remained very limited. This is also observed in Kley and Thomas's study (1997, cited in Vermeer, 1998 p.955) where they noted a few areas where a national environmental authority is supposed to have the final say, but each ministry is responsible for implementing industry-specific legislation.

The lack of monitoring has been further compounded by a lack of enforcement, which hampers legislative mechanisms to improve their practices. Even when environmental violators were detected, if penalised they often faced only weak sanctions -especially accepted for first-time offenders and in many cases they were issued only a warning. In other instances, polluters were exempted from fines on the grounds of financial hardship (O'Connor, 1994 p.94). Even when fines were imposed, the perpetrators were frequently fined so minimally in real terms that the fines have little deterrent value (O'Connor, 1994 p.94). The lack of enforcement in the countries is partly related to political influences. In Indonesia, during Suharto's era, a manufacturing plants, which were owned by a politically-connected proprietor, were not fined and remained untouched, despite its emissions causing a government-owned communications satellite ground

station to be relocated at a cost of US$20 million (Cribb, 1990 p.1129). In Vietnam and China, formal organisational structures, arrangements, and legal regimes have constantly been bypassed by influential party politics, informal networks, and unclear decision-making structures. These jeopardize consistency, transparency, and reliability in policy making and the implementation of environmental management in the both countries (Mol & Buuren, 2003 p.16).

The lack of legislative measures in developing countries comes as no surprise since developing countries have a low political will for the cause of the environment. In order to achieve high modernisation on a par with counterparts in developed countries, growth and industrialization, as well as the high material intensity are promoted. As a consequence, environmental agencies are given less authority vis-à-vis other development authorities. Institutional responsibility for environmental matters is assigned to a low level of the bureaucracy – often a division within the public health ministry. For instance, in Vietnam the environmental authorities could not and cannot operate independently in enforcing environmental laws; they need to negotiate and discuss interventions with the more powerful parts of the bureaucracy (Mol & Buuren, 2003 p.15). The lack of environmental authorities in those countries is further reflected in smaller amounts of resources that they have received from the governments. For example, over the past two decades, the National Environmental Protection Agency (NEPA) and Chinese environmental scientists have urged publicly that China should spend at least 1.5 per cent of its GNP on environmental measures, but China has never spent more than half of that - in 1991 the amount was 0.84 and in 1994 this reduced to 0.68 per cent of its GNP (Vermeer, 1998 p.955-956).

2.9 Summary

This chapter has reviewed the literature that relates to knowledge surrounding corporate environmentalism. In the first part of the chapter the development of environmentalism and ecological issues since 1960s, the concept of sustainability, and approaches to achieving sustainability - NME and EMT - were discussed. The literature review indicated that the 1960s marked the period of widespread public concern, and in the 1980s, the highly publicised environmental disasters had increased perceptions of the vulnerability of nature due to human activities. The global ecological crises like climate

change, global warming and the depletion of the ozone layer warranted international cooperation and the concept of SD was introduced to arrest these environmental crises.

In terms of NME, the literature review indicated that the main principle of the approach towards SD was through internalisation of the externalities (the environment), which would be achieved by means of fees, private ownership, taxes and the polluter pay principle. Both developed and developing countries started experimenting with the mechanism, but their benefits were rather mixed and their implementation fraught with various challenges. Nevertheless, the approach provides an alternative to a traditional CAC that is perceived as rigid and does not encourage proactive environmental behaviours among businesses. In terms of EMT, the literature indicated that its approach leans more on structural changes which involved the role of science towards a cleaner technology or 'superindustrialization'. As with NME it also proposes market dynamics and economic agents, but at the same time strengthens the government involvement in the market through transformation of the state to facilitate ecological practices. Finally the EMT demands modification in the position, role and ideology of social movement in line with the principle of ecology. As with NME, the literature review indicated that outside the domain of the Western European countries where the theory originated, the applicability of theory is rather mixed.

The second part of the chapter discussed the Stakeholder Theory. It was argued that the relative strength of stakeholders depends on the power that stakeholders possessed against businesses. The literature review indicated regulatory stakeholders imposing the highest pressure on businesses to be more environmentally responsible in their activities. Other stakeholders such as customers, distributors, ENGOs, and business associations have started to increase pressure on businesses. Their threats cannot be ignored in terms of businesses' survival. When a comparison was made between stakeholder environmental pressures on businesses in developed and developing countries the literature review indicated that there are both similarities and differences between these two countries. In terms of similarities, overwhelmingly, regulatory stakeholders were perceived as a threat for businesses in the studies, while financial institutions exerted a weak pressure. In terms of differences, first it showed that developed countries perceived a wider range of threats from stakeholders. Apart from regulatory stakeholders, employees (notably top management) and local communities

were the high pressure groups. However, in the developing countries, apart from regulatory stakeholders, other stakeholders were all perceived as weak stakeholders.

Though the literature indicated regulatory stakeholders exerted high pressure on businesses in the developing countries, the regulatory authorities faced a number of challenges such as: lack of staff; inadequate institutional capacity for effective monitoring and control; reliance principally on CAC (which revolves around standards achieved through legal enforcement of performance standards); no economic incentive for being environmentally proactive from the authority under the CAC; monitoring which is complicated and cumbersome due to overlapping of duties between relevant agencies; lenient punishment; and some types of political patronage that hampered efficiency and effectiveness of the regulatory authorities.

The range and type of environmental strategies which business may choose to adopt in response to stakeholders' pressure, their typologies, the environmental effectiveness of the strategies, and the competitive advantages gained as a result of the use of these environmental strategies, will be discussed in the next chapter.

Chapter Three

Literature Review - Environmental Strategies

3.1 Introduction

Chapter One introduced the scope of this research, Chapter Two reviewed the literature pertaining to environmentalism and ecological issues, the concept of SD and two approaches of achieving it - the neoclassical market economy and ecological modernisation theory. This chapter reviews the relevant literature on environmental strategies, environmental effectiveness and competitive advantage. The first part introduces environmental strategies, their levels, and typologies, followed by studies of stakeholders' pressure on the proactiveness of different environmental strategies. The second part discusses environmental strategies' effectiveness and their indicators. This part also reviews studies on the relationship between environmental strategy proactiveness and environmental effectiveness. The last part looks at a broader concept of competitive advantage, types of competitive advantage as well as research on environmental strategy proactiveness and competitive advantage.

3.2 Environmental Strategies

The word strategy has been borrowed from the military domain. It comes from a combination of two Greek words, *stratos* and *agein*, which respectively mean army and commander. In this perspective the word strategy literally can be defined as the art of commanding the army in the battlefield (Schaltegger, Burritt, & Petersen, 2003 p.173). In strategic management, business strategy is defined as 'the direction and scope of organisation over the long term which achieves advantage for organisation through its arrangement of resources within a changing environment and fulfils stakeholder expectation' (Johnson & Scholes, 2002 p.10). An environmental strategy is 'a plan which aims to mitigate the environmental effects of the firm's operations and products' (Bansal, 1997 p.174). According to Sharma (2000 p.683) environmental strategy refers to 'outcomes in the form of actions firms take for regulatory compliance and to those they take voluntarily to further reduce the environmental impacts of operations.'

Moreover, Banerjee, Iyer and Kashyap (2003 p.106) define environmental strategy as 'the extent to which environmental issues are integrated with a firm's strategic plans.'

In corporate environmental management literature, other similar themes on environmental strategy that discuss how organisations react to environmental pressure: 'corporate environmental responsiveness' (Shrivastava & Scott, 1992; Souitaris & Pujari, 1998); 'corporate environmental approach' (Vastag, Kerekes, & Rondinelli, 1996); 'corporate environmentalism' (Banerjee, 1998, 1999); and 'corporate greening' (Preuss, 2005). In this research, these themes will be used interchangeably with environmental strategy.

3.2.1 Levels of environmental strategies

Based on Schendel and Hofer's study (1979, cited in Banerjee, 2001 p.491), Banerjee describes the four hierarchies of environmental strategies in an organisation. The highest one is known as *enterprise strategy*, where a business examines its roles in society and describes its as fundamental mission. Until today only a few businesses (oft-quoted examples are Ben & Jerry's and The Body Shop) are in this category. However, not all products of these two companies are as they claimed to be. Other businesses, have been established to fulfil needs of stockholders and consumers in economic terms. Indeed, business's legitimacy could be judged on this economic function in a society. The next level is *corporate strategy*, which determines the kinds of business a firm should be involved in to meet its enterprises strategy. Among others, product-market decisions, technology development decisions, and business portfolio decisions are made at this strategy level. According to Banerjee (2000 p.1796) if a business is committed to environmental protection at the enterprise strategy level, it commences environmental protection practice or develops minimum-environmental-impact technologies which in turn results in the first-mover advantages. The following level is *business strategy* that involves allocating organisational resources to achieve competitive advantage as well as to integrate the different business functions, such as marketing or research and development. Gaining competitive advantage through cost leadership or differentiation or focus pertaining to environmentalism, is the focus of business strategies. The lowest strategy is a *functional strategy,* which is essential for environmental compliance. For instance, a business installs emission equipment and has a waste management system to

ensure it complies with environmental regulations without overhauling strategic planning to include environmental concerns at the corporate or business strategy level.

3.2.2 Typologies of Environmental Strategies

Since the 1980s a number of typologies of environmental strategies have been developed to explain processes and approaches that businesses are taking towards environmental issues. In these typologies businesses are expected to go through from reactive strategy to proactive strategy and beyond.

Table 3.1: ***Environmental Strategy Typologies***

SOURCE	ENVIRONMENTAL STRATEGY				
Petulla, 1987	Crisis-Oriented	Cost Oriented	Enlightened		
Hunt & Auster, 1990	Beginner	Fire Fighter	Concerned Citizen	Pragmatist	Proactivist
Roome, 1992	Non Compliance	Compliance	Compliance Plus	Commercial & environmental Excellence	Leading Edge
Sadgrove, 1992	Laggard	Punished	Comformer	Leader	
Welford, 1994a	Ostriches	Laggards	Thinkers	Doers	
Dodge & Welford, 1995	Resistance	Observe and Comply	Accomodate	Seize and Preempt	Transcend
Hall and Roome, 1996	Compliance	Eco efficiency	Environment		
Byrne and Kavanagh, 1996	Valley	Cliff	Plateau	Summit	
Hart, 1997	End-of-Pipe	Pollution Prevention	Product Stewardship	Sustainable Development	
Tilley, 1999	Resistant	Reactive	Proactive	Sustainable or Ecological	
Henriques & Sadorsky, 1999	Reactive	Defensive	Accomodative	Proactive	
Buysse & Verbeke, 2003	Reactive	Pollution Prevention	Environmental Leadership		
Thornton, Kagan & Gunningham, 2003	Environmental Laggard	Reluctant Compliers	Committed Compliers	Environmental Strategists	True Believer

The following discussion looks at various types of environmental strategy typologies, as shown in Table 3.1. Petulla (1987) was among the earliest to develop typologies of environmental strategies. Based on the survey of US industries, three typologies were developed - *crisis-oriented*, *cost-oriented* and *enlightened*. (i) Businesses in crisis-oriented strategies neither employed full-time trained personnel to sample, monitor, and keep environmental or safety records of their business activities, nor established a separate environmental unit in the firm. They fought any environmental standards

imposed by regulators. No new pollution control equipment was bought to comply with the regulations. (ii) In cost-oriented typology, businesses had officially accepted environmental regulations as a cost of doing business, and made efforts to comply as efficient as possible. They established company policy, separate units, procedures for environmental compliance, full-time personnel, and negotiated with agencies over disagreements regarding regulatory standards. They also had capital outlay for pollution control equipment and utilised resource recovery of wastes or other cost-cutting recycling. (iii) In enlightened strategy, businesses established a strong corporate support for environmental management policy that went beyond compliance to a long-range environmental planning. These businesses had a strong environmental management division under a major corporate officer; trained environmental personnel, with advancement given those who sought further education and training; state-of-the-art pollution control equipment; sophisticated environmental monitoring, surveillance, and record-keeping systems; periodic environmental audits with reports to corporate headquarters; cooperation between environmental and production staff; on-going research to determine cost-effective methods of maintaining good environmental quality and resource recovery; and good relations with agency officials and community groups.

According to Hunt and Auster's typology (1990) businesses went through five distinct stages: (i) At the *beginner* level, businesses turning their back on the environmental problems, had neither taken efforts to define what the business' environmental requirements were nor what the repercussions of poor environmental management. Environmental responsibility, if addressed, was added onto other programmes. Though reporting occurred, it was only casually. Top managers and employees were relatively uninformed about the environmental problems. (ii) The second level was described as *fire-fighter*. Businesses in this category had a few people who spent some time on environmental matters or they had small centralised environmental staff who helped individual plants respond to crises. However, environmental funding was inadequate and the environmental programmes were understaffed, because the top managers did not believe that environmental issues should be a top priority. (iii) At the *concerned citizen* level, businesses expressed a commitment to good environmental management, but were yet to implement effective proactive programmes. The environmental departments, exclusively staffed by environmental specialists, were often either inefficient or ineffective, being too low in the hierarchy to wield power. Lack of upper level support

hampered integration of the environmental programme with the rest of operations. (iv) In contrast, at the *pragmatist* stage, environmental departments had a sufficient expertise, funding and authority. They periodically reviewed existing facilities and found a better way to limits their pollution, evaluated risks and immediate problems. They had education and training programmes for key employees and substantial time and money were spent on developing policy and guidance manuals. However, environmental management was still not accorded top priority. (v) The top level was *proactivist*, where the environmental department was staffed with strong, motivated, high profile individuals. The employee training and awareness programmes extended across all levels and was taken seriously. They not only had clear environmental goals but also systems to facilitate these goals. Direct reporting and a strong link between function and upper level management in environmental issues were observed.

In Roome's Strategic Options Model (Roome, 1992 p.18) there were five environmental strategies for businesses - *non-compliance*; *compliance*; *compliance plus*; *commercial and environmental excellence*, and *leading edge*. (i) At the non-compliance stage, environmental and other objectives competed with each other. It was an option taken where businesses would not react to changing environmental standards due to cost constraints, the extent of existing liabilities or managerial inertia. Businesses in this category not only had little long-term vision but also little concept of the significance of environmental imperatives. (ii) In compliance strategy, solutions to individual environmental problems were developed as legislation set the agenda. Businesses under this category neither anticipated the changing environmental agenda nor did they take control of their environmental policies. As a result, they were not likely to be in a position to use their environmental stance to gain competitive advantage. (iii) The third strategy was compliance plus. A business adopting this approach sought to integrate EMS into the framework of its business through environmental policy and management system above the requirement of the law. (iv) Commercial and environmental excellence took to a logical conclusion the view that environmental management was good management. These businesses had core corporate and managerial values focused on the achievement of quality. (v) The highest strategy is leading edge, revolving around the state of the art in environmental management, where businesses are not only proactive but set the standard for other businesses as well.

In the same year, Sadgrove (1992, cited in Souitaris & Pujari, 1998 p.137) proposed the green grid that consisted of four environmental strategies. (i) The first stage was *laggard*; this was represented by a business that took no action to conserve the environment, and as a result created a dirty image. (ii) The second stage was *punished*; the most expensive category where a business was subject to punishment from authority as it failed to comply with regulations. (iii) The third stage was *conformer*; it was the most prevalent category, including businesses that stay within the boundaries of environmental regulation and spent the minimum amount on environmental protection. (iv) The last category was known as *leader*; a business that was recognised for its environmental excellence. Between a high risk leader and a safe conformer there was an intermediate position that a business can position itself in. This was known as 'the volcano effect'. It took precautions and concentrated on environmental performance that scored best, for example recycling or low air emissions, in order to gain some of the benefits of the leader, while at the same time enjoying the security of the conformer.

Welford (1994a, cited in Welford, 1998a p.16) suggested another way of categorising the environmental strategy of SMEs. (i) *Ostriches* was the name of the first category, where environmental issues were considered as unimportant and it was assumed that business impacts on the environment were negligible. Moreover, they assumed competitors had the same opinion, did nothing to conserve the environment. (ii) Businesses described as *laggards* were aware of the environmental challenges, but were unable to address them because of lack of resources. (iii) The third group was *thinkers;* they knew something should be done, but were waiting for others to show the way forward. (iv) The last category was known as *doers*, they were the businesses that had proceeded to put their thoughts into practice.

Welford and Dodge (1995, cited in Welford, 1998b p.21) developed an environmental typology - known as the ROAST scale. (i) The least environmental sensitive strategy on this scale was *resistance*. Businesses at this scale disregarded environmental issues in their decision-making. The prime motive would be profit as well as shareholders' satisfaction. (ii) At the *observe and comply* stage, businesses observed environmental law but their actions reflected an unwilling attitude to comply. (iii) In the *accommodate* state, organisations began to change by showing early indications of proactive behaviours and showed voluntary behaviours like utilisation of efficient technology (iv)

Seize and pre-empt organisations were proactively involved in setting environmental agenda. They were responsive to wider external stakeholders, such as engaging in discussion with ENGOs. (v) The highest level under this typology was *transcend* - environmental values, attitudes, beliefs and culture of the businesses showed complete support for the environment, and acted consistently with sustainability.

Hall and Roome (1996) modified Roome's previous model from 1992 to further analyse environmental strategy. They distinguished three scenarios: *compliance*, *eco-efficiency*, and *environmental*. (i) For compliance, its characteristics were the same as the compliance category of the previous typology. Its aim was to minimise liabilities when business economics and environmental performance were seen as in conflict, paralleling the relationship between companies and other external environmental stakeholders. (ii) In the eco-efficiency category, a business' emphasis was on reducing costs and creating a more economically efficient business. Examples of tools that were used by businesses in this category were Total Quality Environmental Management (TQEM) and EMS (iii) In the environmental category, a business' ecological approach integrates ecological values to build competitive advantage and transform business. The three main strands of thinking that had emerged in this category were: portfolio analysis; scenario planning and strategic intent: and core competence. Environmental challenges were viewed as opportunities and stakeholders as partners in helping to create business-based solutions.

Byrne and Kavanagh (1996 p.108-113) in their study of the chemical/pharmaceutical industry in Ireland developed their own environmental strategy typology. The four phases were: *valley*, *cliff*, *plateau* and *summit*. (i) In the valley phase, the business adopted tactical strategy which was characterised by reactive compliance where companies were confronted by environmental groups and received continuous complaints from the public. They had no or little awareness about environmental issues, resented environmental legislation, they also felt it was too costly and difficult to meet environmental legislation and the expectations of the community. (ii) In the cliff phase, the business began to listen to critics, worked with environmentalists and complied with environmental regulations. As a result, there were fewer complaints from the public. However, in this category employees received a modest amount of training in environmental management and were still unclear of the business's environmental management. (iii) The companies in the plateau phase had a good relationship with local

community and were always in compliance. They provided detailed training for specific environmental management only, and other employees had an overall awareness of other environmental procedures. But there were often conflicting statements among managers across departments on the business's environmental strategy. (iv) The final phase was the summit. Businesses not only developed environmentally caring attitudes but also existed in some sort of harmony with both the environment and local community. Everyone in these organisations received environmental training and had an overall awareness of environmental issues. As a result environmental standards of this type of business exceeded the legislative requirement.

Hart (1997) divided environmental strategies into four approaches:- *end-of-pipe*, *pollution prevention*, *product stewardship* and *sustainable development*. (i) The end-of-pipe approach was characterised by limited resource commitment, focused on product and manufacturing processes, and improvements were made to conform to legal requirement *per se*. (ii) In pollution prevention, businesses adopted product and production processes to reduce pollution level below legal standards. This environmental strategy was viewed as cost leadership approach. (iii) Product stewardship approach was a form of product differentiation. Product and manufacturing processes were designed to minimise environmental burden during the product's entire life cycle. (iv) The last approach was the sustainable development. The ultimate aim was to minimise the environmental burden of businesses through development of clean technologies, this required long term vision that was shared among relevant stakeholders and supported by strong moral leadership.

Tilley (1999 p.69) in her study of small businesses in the UK classified environmental strategies into *resistant*, *reactive*, *proactive* and *sustainable or ecological*. (i) Businesses with a resistant strategy ignored the pressures to improve their environmental performance. No deliberate efforts were taken to reduce any environmental impacts of their businesses. (ii) In reactive strategy, environmental response was driven by minimum compliance standards, which often resulted in an ad-hoc and piecemeal approach. Technocratic, cost-driven and reliance on end-of-pipe technology were examples of solutions. (iii) A proactive strategy was reflected in more positive and purposeful efforts to minimise environmental degradations. Although environmental improvements were generally permanent and ongoing, they were not always fully

integrated across the board. (iv) The sustainable or ecological strategy was the highest strategy businesses could pursue; it involved a fundamental rethink of all aspects of the business, which required holistic integration of the environment into the structure and management of the business. In other words, businesses took a more eco-centric 'deep-ecology' approach to environmental management.

Based upon typologies developed from earlier researchers - Roome (1992) and Hunt and Auster (1990) - combined with a more general categorization scheme developed in the corporate social responsibility literature of Wartick and Cochran (1985) and Carroll (1979), in 1999 Henriques and Sadorky developed their own typologies: - r*eactive*, *defensive*, and *proactive*. (i) In reactive strategy no support from or involvement of top management, no environmental reporting and no employee environmental training and involvement were observed. Businesses in this category perceived environmental management as unnecessary. (ii) A defensive strategy was characterised by piecemeal involvement of top management, environmental issues only being dealt with when necessary, and little employee environmental training and involvement. Whatever environmental practice they undertook was merely to comply with environmental regulation. (iii) In contrast with both of the two lower categories, proactive strategy was characterised by involvement and support by top management, employee environmental training and involvement was encouraged, and internal and external reporting and environmental management was an important business function.

Buysse and Verbeke (2003) categorised three strategies based on their study in Belgium, namely: *reactive*, *pollution prevention* and *environmental leadership*. (i) Firms with a reactive environmental strategy were equivalent to Hart's (1995) end-of-pipe approach, and showed low investment in product and processes related to green competencies, employee skills and organizational competencies. No development of a written environmental plan, life cycle analysis, internal and external environmental reporting, and environmental performance inclusion in top management evaluation. Additionally, companies showed little integration of environmental issues nor participation of environmental managers in strategic planning. (ii) Pollution prevention showed increased practice of those methods, but was lower than the environmental leadership strategy. (iii) Environmental leadership, the authors equated with Hart's sustainable development showed the highest qualities of environmental practices.

Thornton, Kagan and Gunnigham (2003) in their study of the pulp and paper industry in Australia, New Zealand, Canada and the US classified five environmental typologies based on attitudes that managers expressed towards environmental problems; their actions and implementation efforts to meet specific demands; and their expectations for those actions. The five types of typologies were: (i) *environmental laggards*, (ii) *reluctant compliers*, (iii) *committed compliers*, (iv) *environmental strategists*, and (v) *true believers*. The two highest commitment categories - true believers and environmental strategists - scanned more intensely and more broadly for environmental information and win-win opportunities, and they were more likely to see an environmental investment as win-win even if it did not clearly meet return on investment criteria. In other words, they were likely to see the pursuit of environmental excellence as a real business strategy, not just a regulation-based constraint. Additionally, the environmentally committed categories were more responsive to legal and social stakeholder demands, and lastly the categories showed a greater commitment to developing reliable implementing routines for their environmental policies, integrating environmental control more tightly with production and quality control.

This review of the environmental typologies of various authors in the above discussion provides some interesting observations. Though numbers and definitions of stages of environmental strategies may differ with one another, in the above models, overall, all of these typologies agree in the following two aspects. First, business environmental strategies show a continuum, which ranges from reactive compliance to legislation at the lower end to proactive and leading business practices at the upper hand. Reactive compliance tends to exercise environmental practices at operational level, whereas proactive companies exercise higher levels of environmental practices – tactical and strategic. Second, environmental strategy is an evolutionary process. Due to various environmental pressures, businesses improve their environmental strategies accordingly (Souitaris & Pujari, 1998 p.139).

The main problem of using such a typology is that it assumes that all organisations will move from the lowest stage to the highest stage of environmental proactiveness. However, this is not true for all businesses; the extent to which businesses in different sectors of industry have adopted environmental strategies vary from one to another. According to Hutchinson (1996 p.15) there are three penetration levels pertaining to

environmental strategies: high, medium and low. Businesses in the high penetration level are in damaging, dirty or dangerous industrial sectors. Since they are the most exposed to stiffer regulations, they implemented the highest level of environmental strategies. Industries that are wasteful and polluting are in the moderate level of penetration of environmental strategies. They have some impact and are moderately exposed to stiffer regulations. Many of them have discovered that they can save considerable sums of money by cutting wasteful practices and reducing pollution, mainly at source. The lowest penetration of environmental strategies is demonstrated by the silent destroyers. Many of these businesses believe that environmental matters do not concern them, let alone realize how they can contribute to environmental solutions.

3.2.3 Stakeholders' Pressure and Environmental Strategy Proactiveness

In the studies of stakeholders' pressure in the previous chapter no attempt was made to evaluate different kinds of environmental strategy proactiveness. In the reality there are various ways companies respond to stakeholder pressure. By and large environmental regulation is the single most powerful stakeholder, and thus companies are expected to exercise reactive strategy, why are some companies more proactive than others? Another question is, do proactive companies differ from reactive companies in their perceptions of the threats from different stakeholders? This seems likely, since for proactive companies, regulatory stakeholders are no longer considered threats because the companies over comply with the regulations, and instead perceive other stakeholders as greater threats. The reverse is likely to be true for reactive companies where environmental regulators are considered as main threats and the company's environmental strategies aim to comply with the regulations to avoid punishment.

There have been a number of studies conducted in developed countries to measure how firms with various level of environmental strategy proactiveness perceived pressure from environmental stakeholders. In a study in Canada, Henriques and Sadorsky (1999) investigated the perceptions of managers about the four different types of environmental strategies (reactive, defensive, accommodative and proactive) in relation to the influence of the four groups of environmental stakeholders: regulatory, community, organisational (internal) and media. The overall patterns of their results supported the idea that managers of the proactive group of companies perceived that all stakeholders

(with the exception of media) exerted a high influence on them. As environmental leaders they viewed environmental strategy proactiveness as an important business function. The reverse was true for reactive companies, where all stakeholders except the media were not perceived to exert an influence on them. The authors argued that the reactive companies were more likely to be concerned about being caught outdoing something environmentally wrong by a reporter, than about being caught by a regulator.

In another study in Canada, Sharma (2000) investigated reactive and proactive environmental strategies of the 99 petroleum companies, and found the former strategy involved complying with regulations and adopting standard industry practices, while the latter perceived importance of wider stakeholders and sought to reduce the environmental impacts beyond regulatory requirements. He found management of proactive environmental strategy companies perceived strong institutional (internal) pressures, compared to those with a reactive environmental strategy.

Meanwhile, Gil, Jiménez and Lorente (2001) studied environmental strategy in the Spanish hotels. Though environmental regulators were not the main environmental stakeholder for the hotel industry, as it is considered as a less damaging activity, they found stakeholders' pressure helped explain proactiveness of environmental management in the industry. The management of hotels who perceived strong pressure from wider stakeholders on environmental issues adopted a more proactive strategy than their counterparts who did not perceive such pressure. In a further study Lorente, Jiménez and Alvarez (2003) investigated stakeholders' influence on the Spanish hotel industry in terms of stakeholders' legitimacy, power and use of power against the industry. Their findings showed all the attributes significantly related to the industry's environmental strategy proactiveness, where proactive companies perceived the economic legitimacy, power and use of power by stakeholders against the industry.

In a further study, Buysse and Verbeke (2003) empirically investigated the relationship between different categories of environmental strategy proactiveness and stakeholders' pressure in 197 companies in various industry in Belgium. Stakeholders were divided into four categories: - (i) internal primary stakeholders (employees, shareholders, and financial institutions). (ii) external primary stakeholders (domestic customers, international customers, domestic suppliers, and international suppliers). (iii) secondary

stakeholders (domestic rivals, international rivals, international agreement, NGOs and media) and (iv) regulatory stakeholders (national and regional governments and local public agencies). They found that managers of companies with different levels of strategy proactiveness (i.e. reactive strategy, pollution prevention and environmental leadership) perceived a different intensity of threat from stakeholders. Although the observed companies in pollution prevention category perceived higher threats from regulatory stakeholders compared to those employing environmental leadership and reactive strategy, the difference between them was not significant. On the other hand, proactive companies (environmental leadership) were significantly different to other categories in terms of perceived pressures from primary and secondary stakeholders. In short, the more proactive companies perceived a broader coverage of stakeholders' pressures compared to less proactive companies. In the recent study of the US wine industry, Marshall, Cardano and Silverman (2005) found internal pressure (employees, notably higher management) and regulators were important stakeholders that exert an influence on the wine industry. On the contrary, community and consumers were considered as secondary pressures and did not exert much influence on the industry to behave environmentally proactively.

From analysis of the above studies on corporate environmentalism and how stakeholders' pressure impinged on those companies, one important observation can be made -management of the more proactive companies tended to perceive a wider range of threats from environmental stakeholders compared with reactive companies. Further, top management involvement in environmental issues was also perceived as an important factor that influences a company's environmental proactiveness.

3.3 Company Size and Resources, and Environmental Strategy Proactiveness

Apart from stakeholders' pressure, a firm's size and its resources are seen as important factors that could determine companies' environmental strategies. There are several arguments why the size of the business will be a determinant of environmental strategies. First, large companies are likely to have more resources, and that increases a company's ability to a better access environmental information, which in turn provides the business more competitive advantage (Russo & Fouts, 1997; Sharma, 2000). Second, firm size has been related to the existence of economy of scale which is

inherent in environmentally oriented investments (Chapple, Morrison, & Harris, 2005). Third, firm size is related to visibility to the public; where large businesses are more visible, this visibility might make them more sensitive to public opinion and in turn make them more likely to invest in environmental innovation and be perceived as an industry leader (Henriques & Sadorsky, 1996; Rothenberg & Zyglidopoulos, 2007). Fourth, larger companies have more power to influence regulatory authorities to set tighter standards for the industry (Epstein & Roy, 2000). Lastly, strategic management in small and medium-sized businesses focuses on short-term profitability, while on the contrary big businesses have a long-term vision, this puts big companies in a conducive situation to evaluate environmental investment (Epstein & Roy, 2000).

Although many authors believed that there was an impact of size on environmental strategy proactiveness, findings of empirical studies showed mixed results. On the positive side, a recent study by Elsayed (2006) of various businesses in the UK demonstrated that company size explained the different in environmental strategy. Likewise, Rothenberg and Zyglidopoulos (2007), in their recent study on the adoption of environmental innovations in the US printing industry, also found a strong correlation between size and environmental innovations. In a further study by Sharma (2000) on the 99 petroleum and gas businesses in Canada, he found company size (average annual sales for the last three years) had a positive effect on environmental strategy. In study of 197 companies of various industries in Belgium, Buysse and Verbeke (2003) found size (annual sales) moderate the relationship between environmental strategy and stakeholder orientation. In addition, a study of 750 large companies in Canada by Henriques and Sadorsky (1999) also found size (sales per assets) moderates the relationship between both regulatory stakeholders and community stakeholders on environmental strategy.

While the above-mentioned studies showed positive correlation between size of a company and its environmental strategy, other studies presented opposing findings. Using the survey data collected from a wide variety of firms and industries based in the US, Judge and Douglas (1998) examined the effect on size on environmental strategy of those companies, and found no significant correlation between size and environmental strategy. A further example is a study by Waddock and Graves (1997) who found no significant relationship - using three proxies for the firm size (i.e. total assets, total sales

and total number of employees). Likewise, Toms's study (2002) of 260 British companies found no significant correlation between company's size (sales turnover) with either environmental reputation or environmental corporate disclosure.

The proponents of Resource-based View of the Firm (RBVF) have argued strongly that the greater resources that are available to a firm, the greater the proactivenss of their environmental strategy (Hart, 1995; Russo & Fouts, 1997; Sharma, 2000). The availability of resources gives companies advantages to choose a proactive strategy. Unfortunately, empirical studies have yield mixed results. Findings of study by Judge and Douglas (1998) supported the hypothesis that the availability of resources correlated with the integration of environmental issues into the strategic planning process. In a similar vein, Stanwick and Stanwick (1998) in their study concluded that environmentally responsible companies were likely to have more resources.

On the other hand, the recent study by Elsayed (2006) did not find any significant impact of the availability of resources on a company's environmental orientation. This is further supported by study by Henriques and Sadorsky (1996) of various industries in Canada. In their study they found the level of environmental strategy proactiveness was not influenced by the resources owned by these companies. Similarly, a study by Toms (2002) in the UK found no support for the availability of resources influencing environmental strategy.

Due to inconclusive results regarding the effect of both size and resources of companies on their environmental strategies, more research is needed to investigate the relationship between both size and resources on environmental strategy proactiveness.

3.4. Environmental Effectiveness and Performance

The importance of linking environmental strategies of an organisation and environmental effectiveness have been stressed by many authors (Dixon, 1990; Harvey, 1994; Thoresen, 1999). As a result of pressure from stakeholders, the demand on companies to measure, document and disclose information about environmental performance will become more pervasive (Tyteca, 1996 p.282).

According to Ashford & Meima (1993, cited in Young, 1998 p.150) environmental performance of firms is measured by the extent and effectiveness of actions that the firm takes to mitigate its environmental consequences. In another study, Judge and Douglas (1998 p.245) define 'environmental performance as a firm's effectiveness in meeting and exceeding society's expectations with respect to concerns for the environment.' They added that this desired end would extend beyond mere compliance with existing regulations to a proactive stance concerning future environmental considerations.

From an economic policy viewpoint, environmental performance is important because its measurement can provide the tools to study the effectiveness of environmental regulation, taxes and various other kinds of economic instruments, as means to improve environmental quality. The information derived from environmental performance measurement can provide policy makers with meaningful guidelines in order to implement relevant economic and/or regulatory instruments (Young, 1998 p.150).

The main question in environmental performance is what environmental characteristics are to be measured? Not all aspects of environmental performance will be considered in the measurement. Which environmental information is measured is determined by environmental indicators adopted by an organisation, or by other parties interested in an organisation's environmental performance.

3.5 Environmental Effectiveness/Performance Indicators

There is no single definition of an environmental effectiveness/performance indicator. Environmental performance indicators 'are measures of company proficiency in protecting the environment' (European Green Table 1993 p.4, cited in Johnston & Smith, 2001 p.2). According to Johnston and Smith (2001 p.2) environmental performance indicator can be interpreted as 'measurements that describe the way an organization manages its environmental impacts.' Tyteca (1996 p.281) defines environmental indicators as 'analytical tools that allow one to compare various plants in a firm, or various firms in an industry, with each other and with respect to certain environmental characteristics.'

As far as quantification of measurement of environmental performance is concerned, there are two types of measurement: qualitative and quantitative measures. Quantitative measures are noticeably the easiest to deal with - physical things where objective measures are possible. Davis (1994, cited in Young, 1998 p.157) stated that quantitative measures give weight and usefulness to qualitative information such as environmental policies, but only as long as the qualitative message is clear. A problem may arise in that current measures may, over time, become obsolete. Fiksel (1994 p.189) described quantitative measures as relying on empirical data and deriving numerical results in physical, financial or other meaningful terms. The problems with quantitative data according to him were that they could be burdensome to gather or unavailable. A further disadvantage of quantitative data is that the reasoning or thinking behind the figures is often not shown (Johnston & Smith, 2001 p.3).

As far as quantitative data is concerned there are four types of environmental performance indicators: *absolute*, *relative*, *aggregated*, and *index or weighting* (Young & Welford, 1998 p.36). Absolute indicators measure basic data (Fiksel, 1994 p.189), such as carbon dioxide emissions (kg). While absolute indicators provide useful information, care must be taken not to draw false conclusions. For example reduction in carbon dioxide emissions does not necessarily mean the company's efficiency has improved; instead, this could be due to a downturn in business. Relative indicators compares absolute consumption figures with meaningful reference data, such as units of production (Fiksel, 1994 p.189). A problem occurs with relative indicators in, for instance, large organisations. Relative indicators may show for Company 1 an increase in efficiency of carbon dioxide emissions per unit of production. But this may hide the total amount of carbon dioxide produced in absolute terms, which could be significant if benchmarking a large company to a smaller one (Young & Welford, 1998).

Aggregated indicators bring together data from a number of separate categories into a more general category (James, 1994). For example, a sum of all waste produced by a company is known as 'annual waste disposal'. Aggregated indicators are useful as they can bring together a large amount of data and express it as a single value, thereby providing an overview of a particular area. However, because aggregated indicators paint a broad picture, there is a limit to how much detail they can show. If annual waste disposal stays constant from one year to the next, then without a further breakdown of

the figures, it would not be known which types of wastes may have gone up and which wastes may have gone down. This can be solved by weightings that increase or decrease the importance of certain components within the aggregated indicator.

The index indicators are comparisons of a piece of data to another baseline piece of data (Young & Welford, 1998 p.39). However indexing is difficult, can be statistically uncertain and hides detail. Weighting of environmental aspects is also to some extent subjective and judgements relating to the significance of environmental aspects will vary from firm to firm (Young & Welford, 1998 p.39).

A subjective judgement will also often need to be made and some sort of qualitative measure will have to be undertaken. Qualitative judgements can be translated into useful information by the use of rankings. According to Fiksel (1994 p.188) qualitative measurements rely on semantic distinctions based on observation and judgement. It is possible to assign numerical values (scores) to qualitative measures. An advantage of qualitative measurements is that they impose a relatively small data collection burden and are easy to implement. The disadvantage is that they implicitly incorporate subjective information and therefore are difficult to validate.

There are a wide range of roles for environmental performance indicators: to illustrate progress against target; to inform management; and to communicate the company's position (Johnston & Smith, 2001 p.1). Table 3.2 gives examples of the various functions that environmental indicators may have in different context (Olsthoorn, Tyteca, Wehrmeyer, & Wagner, 2001 p.454).

According to Welford and Gouldson (1993 p.70-71) there are three types of environmental indicators. First, there are environmental impacts through the measurement of waste, effluent, discharge and energy usage. Other measures are contributor measures and external relations measures. Contributor measures involve areas such as technology, materials, products, suppliers, and management systems (Table 3.3). External relations measures include the assessment of risks in which involve impact measures, positive measures and risk measures (Table 3.4.).

Table 3.2: ***Different Users and Functions of Environmental Indicators Inside and Outside the Firm***

User/decision context	Function for the user
Corporate manager	To monitor a firm's environmental development in relation to strategic targets To identify most harmful wastes and emissions To communicate corporate environmental performance/attitude to stakeholders Reference performance in preceding periods/years
Production plant manager	To identify opportunities for improvements of efficiency To convey information on the efforts to limit environmental impact of plant operations
Market managers	To identify new market opportunities To defend market positions; reference point competitors
Purchasing manager	Accountability; business-to-business relations
Environmental authorities (compliance situation)	To test compliance of firm with permits
Authorities (national)	In voluntary agreements; communicating a firm's effort to environmental improvement Useful for constructing databases that are helpful in developing and implementing a government's environmental policy
Investors and shareholders	Indicator for financial performance May indicate environmental liabilities that could effect a firm's financial performance
Consumers	To meet needs of green consumer

Source: Table 1 (p.454) - Olsthoorn *et al.* (2001), "Environmental indicators for business: a review of the literature and standardisation methods". *Journal of Cleaner Production*, 9(5).

Table 3.3: Contributor Measures

Performance Area	Examples of measure
Technology	Level of investment in new technology Substitution of clean technology Effectiveness of new systems
Materials	Utilisation of process materials Use of renewable resources
Products	Implementation of design changes Level of investment to meet higher environmental standards Level of rejects and direct waste
Suppliers	Achievement of supplier survey Implementation of supplier awareness initiatives New procurement procedures
Management systems	Level o implementation of system Effectiveness of new procedures Performance against audit Level of organisational commitment and participation Existence of training programme

Source: Table 4.1 (p.70) - Welford and Gouldson (1993) *Environmental Management and Business Strategy*, Pearson Education, London.

Table 3.4: ***External Relations Measures***

Area	Examples of measures
Impact measures	Numbers of prosecutions Level of complaints Positive and negative exposure resulting from pressure groups Number of complimentary or adverse media reports Falls or increases in sales related to environmental impact
Positive measures	Level of public disclosure Availability of environmental impact information Level of consultation with outside agencies Public awareness programmes Level of support for external environmental programmes
Risk measures	Measures of the probability of accidents Existence and understanding of emergency plan Speed and effectiveness of emergency plan Communication with emergency services Public disclosure of likely impact of accidents

Source: Table 4.2 (p.71) - Welford and Gouldson (1993) *Environmental Management and Business Strategy*, Pearson Education, London.

3.6 Studies on the relationship between Environmental Strategy Proactiveness and Environmental Effectiveness/ Performance

Notwithstanding huge amount of research on environmental strategy typology, empirical research into the impact of various environmental strategies adopted by businesses on their environmental effectiveness/performance is lacking. Only a few studies measured the effect of various environmental strategies adopted by companies on their environmental performance. For example, Thornton *et al.* (2003) in their study of 14 pulp manufacturing mills in Canada, Australia, New Zealand and the US, using their five typologies of environmental strategy, identified no *environmental laggards*, two *reluctant compliers*, four *committed compliers*, four *environmental strategists*, and two *true believers*. They found the average emissions for *true believers* were largely lower than the average for environmental strategists, whose emissions were largely lower than the average for *committed compliers*, whose emissions were substantially lower than the average for *reluctant compliers*. In addition, both true believers and environmental strategists achieved larger incremental gains in environmental performance due to commitment of to day-to-day environmental management. The study also found that true believers had fewer costly and environmentally damaging accidental spills of pulping chemicals. A further advantage was that true believers showed a pattern of continuous progress in environmental improvement over time.

The following studies did not categorise different strategies of environmental proactiveness, but considered the various impacts of individual proactive environmental practices on environmental performance. For examples, the use of voluntary environmental protection instruments such as EMS, Corporate Environmental Reporting (CER), it would be correct to say that company practice can be categorised as environmentally proactive. Indeed, from the literature of environmental typology, it was found that most companies with a proactive environmental strategy adopted such voluntary tools. The EMS ISO 14000 standard may well be an indicator of a company's commitment to environmental responsibility (Murray, 1996; Tucker & Kasper, 1998). The key elements of the ISO 14001 series include undertaking an initial environmental review; defining an environmental policy; developing environmental action plans and defining environmental responsibility; developing internal training courses and auditing.

A numbers of researchers showed the positive impact of ISO 14000 certification on a company's environmental performance. Annandale, Morrison-Saunders and Bouma (2004) investigated the impact of EMS practices of 40 companies in various industries in Western Australia. Among the positive impacts of EMS were: first, it improved environmental awareness of employees, senior management, or contractors; and second, it increased operational performance such as pollution control, production efficiency improvements, and increasing resource input efficiencies for energy and water. Respondents in their study also pointed out other 'ancillary' benefits of EMS such as (i) assisting in risk assessment, (ii) cost savings in relation to resource inputs and waste outputs, (iii) integration with health and safety provision where efficiencies could be gained by coordinating ISO processes and (iv) improved compliance with regulation.

In another study, Goh, Zailani and Wahid (2006) investigated the impact of ISO 14001 on business performance on 45 certified sites in Malaysia. Overall, their study showed ISO 14001 certification has a positive impact on a firm's performance, specifically on perceived economic impact, perceived environmental impact and perceived customer satisfaction. Conversely, no significant positive impact of the certification on perceived market position was found among the sites.In another recent study, Tan (2005) investigated benefits of ISO 14001 in 18 various companies in Malaysia. He found those ISO 14001 certified companies benefited in a number of ways such as minimised waste and adverse impact on the environment, reduced energy consumption, improved

operational safety and material utilisation efficiency, enhanced competitive position, uplifted public image and better communication. However, there were some benefits that were reported in studies of EMS in industrialised countries such as 'cost based competitive advantage'; 'environmentally friendly product that also meets customers' needs'; 'employee empowerment' and 'enhanced the relationship between SMEs and their stakeholders' which were not mentioned in the Malaysian study.

In Sweden, Poksinska, Dahlgaard and Eklund (2002) found a majority of the surveyed companies in their study claimed substantial benefits were achieved from utilising ISO 14001. The most important benefit perceived was an improvement in corporate image; 80 of respondent per cent made this claim. 72 per cent of the respondents perceived substantial and very substantial benefits in environmental improvement; also significant benefits were achieved in improvement of internal procedures, and improvement of relations with authorities and communities. Moderate improvements were seen in increased customers' satisfaction, employee morale and increased market share. On the other hand, low benefits were perceived in terms of productivity and profit margin. Drawing on data provided by a survey of North American company managers, Melnyk, Sroufe and Calantone (2003) assessed the relative performance effects of companies with no formal EMS present, those having a formal but uncertified EMS, and those with a formal, certified system. Results of their study showed that firms utilising a formal EMS perceived impacts well beyond pollution abatement and saw a critical positive impact on many dimensions of operational performance. The results also showed that ISO certified companies experienced a great impact on performance in terms of reduction of overall costs and lead times, improvement in market place position, company's reputation, and better designed products.

3.7 Environmental Competitive Advantage

3.7.1 Business Strategy and Competitive Advantage

The theory of competitive advantage is well established in business literature (Ansoff, 1965; Davidson, 1987; Porter, 1980; Porter, 1985). In general, competitive advantage occurs when a firm implements a value-creating strategy which other companies are unable to duplicate the benefits of, or find is too costly to imitate (Hanson, Dawling,

Hitt, Ireland, & Hoskisson, 2002 p.5). Igor Ansoff (1965), one of the most influential figures in business strategy, suggested a number of strategies an organisation can pursue to gain competitive advantage. Strategies such as (i) market penetration by increased use or new uses for an existing product, (ii) market development by geographic expansion, (iii) product development by product improvement, product line extensions, or (iv) developing new products for the same market were recommended. Ansoff (1965) also suggested diversification strategy and related it to the technology of the firm to secure competitive advantage:

> [A] common thread is to isolate characteristics of unique opportunities within the field defined by the product-market scope and the growth vector. This is the competitive advantage. It seeks to identify particular properties of individual product markets which will give the firm a strong competitive position (Ansoff, 1965 p.99)

Michael Porter's (1980) generic strategy has been widely recognised in strategic management as the means to gain competitive advantage. He believes competitive advantage can be obtained through cost leadership strategy, leading to lower prices for buyers, or differentiation of the product from competitors' offerings and focussing on a particular segment of the market (Porter, 1980). Companies that exercise differentiation would gain a premium price for their product differentiation. Among other things Porter (1985) also suggested that an organisation's competitive advantage depends not entirely on products but also can be achieved through value creating activities; as he puts it: 'Competitive advantage grows fundamentally out of value a firm is able to create for its buyers that exceeds the firm's cost of creating it' (Porter, 1985 p.3).

Porter (1980) utilized his value chain analysis to disaggregate the firm's activities according to their value-creating functions, so that the relevant resource or capability can be analysed for its potential as a cost or differentiation strategic driver. Value activities can be divided into two broad types - primary and support activities. Primary activities consist of inbound logistics, operations, outbound logistics, marketing & sales and service. Primary activities are the activities involved in the physical creation of the product, and its sale and transfer to the buyer, as well as after sale assistance. Support activities support the primary activities and each other by providing purchased inputs, technology, human resources, and various firm-wide functions. According to Porter (1985) value activities are the discrete building blocks of competitive advantage. How each activity is performed combined with its economics will determine whether a firm

is high or low cost relative to competitors and/ or how it differentiates itself from competitors.

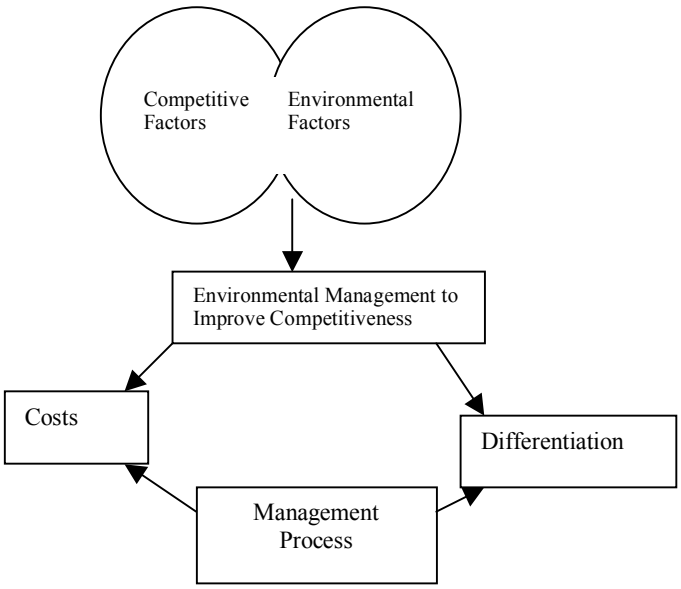
3.7.2 Environmental Strategy and Competitive Advantage

Whilst the pursuit of 'traditional' competitive strategies does not exclude ecological considerations, environmental paradigms such as SD have directly encouraged an ecological risk analysis in the exercise of business enterprise. Recent research in strategic management suggests that the traditional competitive pressures identified by Porter (1980) are now joined by concerns about social and environmental issues (Hastings, 1999 p.268). Richard Welford and Andrew Gouldson (1993 p.11) were among the first who integrated competitive advantage into corporate environmental management. They suggested that the main constituents of competitive advantage in corporate environmentalism were: (i) positive pressure groups relations; (ii) improved media coverage; (iii) cheaper finance; (iv) lower insurance premiums; (v) reduced risk exposure; (vi) assured present and future compliance; (vii) improved material efficiency, (viii) improved product quality; (ix) increased staff commitment and (x) improved community relations

Welford's indexes of competitive advantage are very similar to Lefebvre and Talbot's (2000, cited in Tien, Chung, & Tsai, 2005 p.788) competitive advantage indexes, which include: (i) cost reduction in manufacturing and production; (ii) cost reduction in inventory management; (iii) cost reduction in transportation; (iv) increase in income; (v) increase in market share; (vi) increase in profit (vii) market opportunities for products; (viii) corporate image improvement; (ix) conformity with laws and regulations; and (x) minimum punishment due to violation of environmental laws and regulations.

In addition, Welford (1998b p.26) was also among the first who integrated environmental factors with the two business competitive advantage factors - costs and differentiation proposed by Porter. Welford argued that businesses could increase their competitive advantages using both cost reduction and environmental management product differentiation strategies. Figure 3.1 illustrates Welford's general approach for improving competitiveness through environmental management.

Figure 3.1: ***Improving Competitiveness through Environmental Management***



Source: Figure 2.6. from Welford, (1998a). *Corporate Environmental Management*. 2nd ed. Earthscan, London, p. 26

According to Welford (1998a) businesses need to consider their general competitiveness based on important environmental factors, especially industries experience more social performance pressures - extractive industries, oil exploration and mining companies. A study of an industry's structure in turn leads to the development of an environmental management strategy to improve competitiveness through cost reduction and/ or differentiation of products. Differentiation is not only unique to products, since environmental systems (such as ISO 1400 certification and product life cycle analysis), marketing approach and other strategies provide differentiation for businesses. A company that builds its image as an environmentally friendly organisation through its various activities can be considered as adopting differentiation strategy that confers competitive advantage. In corporate environmentalism, both strategies (differentiation and cost leadership) can be achieved through various environmental tools. Welford (1998a) identifies a number of ways in which a company can both improve its environmental performance and achieve costs reduction (Table 3.5).

Since cost reduction strategies require inputs into the production process (including materials, energy, water, and packaging) as well as management of pollutants and waste-by products, supply chain and product stewardship initiatives help in improving company environmental performance (Welford, 1998a p.27). For example the Life

Cycle Assessment (LCA) of a product is pertinent in an investigation of competitive advantage.

Table 3.5: ***Cost Reduction Strategies***

Material use	Reduce components Materials substitution Increase recyclability Reduce quantity of material/weight Supply chain pressure Product design
Energy usage	Fuel substitution Energy efficiency
Emissions and effluent (including water usage)	Reduce need for water Recycling Reduce inputs Process redesign Process efficiency Identify markets for emission and effluent Redesign products and processes
Waste management	Reuse strategies Recycling Identify markets for waste Reduce Packaging
Distribution (including packaging)	Substitute different material for packaging Reduce transportation Increase fuel efficiency of vehicles Logistics planning Optimal loading of vehicles

Source. Table 2.3 (p. 27) - Welford, (1998a). *Corporate Environmental Management*. 2nd ed. Earthscan, London..

On the other hand, differentiation according to Welford, relates to the ways in which a company and its products are perceived by its stakeholders. Such a strategy requires a company to: (i) develop sound environmental performance; (ii) engage in effective marketing and distribution strategies; and (iii) communicate its performance to stakeholders. Sound environmental performance is based on having green products, green processes and green supply chains. Effective communication is based on a company's marketing capabilities and stakeholder accountability. Education, campaigns and projects initiatives will aid differentiation strategy.

Reinhardt (1998) stated that product differentiation must satisfy three basic conditions to ensure success; (i) customers are willing to purchase environmental products, (ii) products are worthy of the consumers' trust and (iii) innovative products are difficult to

copy by competitors. Due to its uniqueness a company that differentiates itself from its competitors is rewarded with a premium price for its products. By addressing social and environmental concerns, firms may differentiate and distance themselves from competitors, improve financial performance and enhance company reputation (Russo & Fouts, 1997). Since some companies have limited opportunity to gain competitive advantage from product or price differentiation, differentiation by improved reputation can be a major factor, in addition to minimizing production costs in achieving competitive advantage (Hastings, 1999 p.271).

Though competitive advantage theory had existed for some time, only recently the notion has emerged that improved environmental performance is a potential source of competitive advantage since it can lead to efficient processes, improvements in productivity, lower costs of compliance and new market opportunities (Porter & van der Linde, 1995b; Schmidheiny, 1992b). According to Wagner, Schaltegger and Wehrmeyer (2001 p.97-98) two major reasons underpin this argument. First, companies facing higher costs for polluting activities have an incentive to research new technologies and production approaches that can ultimately reduce the costs of compliance. However, innovations may also result in lower costs, for example, lower input costs as a result of enhanced resource productivity. Second, companies can gain 'first-mover advantages' from selling their new solutions and innovations to other firms. From a dynamic, longer term perspective, the ability to develop new technologies and production approaches is a greater determinant of competitiveness than are traditional factors of competitive advantage such as low-cost production or generally the comparative cost advantage of a country (Porter & van der Linde, 1995b). Hence, industry leaders could gain competitive advantage by establishing the industry standard and creating a potential barrier to entry (Barrett, 1992). At present there are a number of companies operating their business activities in an environmentally friendly manner and environmentalism strongly underpins the very nature of their businesses. They differentiate themselves from others by being environmentally conscious and enjoying a better financial bottom line whilst at the same time being socially and environmentally responsible. One case in point is the Body Shop, a British-based cosmetic chain that is commonly perceived as an environmental leader, which is driven by values rather than products and sees its mission as being an emissary for social change (Dechant & Altman, 1994). These values are operationalised through the training of the Body Shop

managers to promote environmental causes within their specific geographic locations, championing animal rights and the rights of indigenous people, and publishing an annual eco-audit to report on actions taken in support for its mission and values.

In the international scene, many companies from Germany are well known for their best environmental management practices. Stringent environmental law in the home country confers competitive advantage for their industries in the international market vis-à-vis their competitors. Many of Germany's companies reap benefits as companies from other countries buy their environmentally friendly technology. Success of German companies supports the arguments put forward by Porter and van der Linde (1995) that stringent local regulation confers competitive advantage as the environmental management of such a company easily surpasses its host countries' environmental regulations.

3.7.3 Research on Environmental Strategy Proactiveness and Competitive Advantage

There have been a number of studies of environmental management proactiveness and competitive advantage. Shrivastava (1995a) investigated the relationship between environmental strategy and business competitive advantage. He argued that environmental technologies which are considered as a strategic asset could be used to gain competitive advantage. According to Shrivastava, (1995a p.185) environmental technologies are evolving both as a set of techniques (technologies, equipment, operating procedures) and a management orientation. As a technique they are used for pollution abatement, waste management, energy, water and material conservation, and for improving technological efficiency of production. As a management orientation, environmental technologies have spawned environmentally responsible approaches towards product design, manufacturing, environmental management technology choice, and design of industrial systems. Using a number of case studies, Shrivastava showed companies that utilised environmental technologies enjoyed competitive advantage of their businesses vis-à-vis their competitors. For instance, a case study of 3M by Shrivastava showed that the organisation integrated environmental technologies provided competitive advantage in terms of: (i) cost reduction, (ii) revenue enhancement, (iii) suppliers ties, (iv) quality improvement, (v) competitive edge, (vi) reduction of liabilities, (vii) social and health benefits, (viii) public image, (ix) ahead of

regulatory curve, and (x) competitive landscape. A case study by Sharma and Vredenburg (1998) investigated the relationship between environmental strategy and competitive advantage of nine petroleum companies in Canada. They found management of proactive companies gained a number of competitive advantages. These included: (i) lower costs of processes / input / products, (ii) innovations in processes / products / operating systems, (iii) improved corporate reputation, and (iv) improved relationships with a wide range of stakeholders. On the other hand, the reactive companies were unable to associate their corporate environmental strategy with any positive organisational outcomes.

A positive relationship between proactive corporate environmentalism and competitive advantage is also supported by various empirical studies. Delmas (2001) investigated the link of the adoption of ISO 14001 to competitive advantage of various firms in the US. Delmas' study showed that involving external stakeholders (distributors, customers, community members and regulatory agencies) in the design of EMS provided a valuable organizational capability. He argued that the involvement of external stakeholders in the process of ISO 14001 facilitated the communication of credible information on the standard.

In a recent study Tien, Chung and Tsai (2005) empirically investigated the impact of environmental strategies and environmental design activities on environmental design implementation, and thus on business competitive advantages, in various of Taiwan's industries. Competitive advantages were measured in both cost reduction of operations and a number of product differentiations. Their costs reduction indexes include: (i) decrease in procurement costs of raw materials or components; (ii) decrease in manufacturing costs; (iii) decrease in product use and maintenance costs; (iv) decrease in packaging and transportation costs; (v) decrease in disposal costs; and (vi) decrease in costs associated with pressure from or penalty by environmental protection laws and regulations. In contrast, the indexes for product differentiation in this research include: (i) increase in market share; (ii) improvement in corporate image and credibility; (iii) product quality enhancement; (iv) product safety and security improvement; and (v) decrease in time required before the product is ready for sale. Tien *et al.* (2005) found that both internal motivation and environmental strategies influenced environmental design implementation and had significant effect on business competitive advantages.

Tien *et al.* (2005) study's findings were also supported by a recent study by Goh, Zailani and Wahid (2006) of the impact of EMS certification on performance in various industries in Malaysia. The results of their study revealed that certification impacted positively on both the environmental and economic performance on surveyed companies. Respondents perceived the strongest impact of certification was an enhanced corporate image, and they also believed that the benefits obtained from the EMS certification far out weighed the cost of its implementation. In a further study in Malaysia, Slater and Angel (2000) investigated environmental strategies and competitive advantage of natural resource or energy-intensive sectors of local companies. They found companies involved in internalization through joint ventures or setting up new companies adopted proactive environmental strategies, whereas companies that are involved in domestic operations adopted a reactive environmental strategy. In the former, environmental issues were part of a coherent corporate strategy where the capabilities of the firm and impact on the environment are considered when deciding on new products or processes. The benefits obtained from operations were valued for their direct benefit to the environment, which in turn translated into cost savings and efficiency improvement.

In another example, Hastings (1999) studied how major oil companies used new strategic capabilities to gain competitive advantage in their oil explorations in sensitive areas in Latin America. Three strategic capabilities developed by those companies were environmental management, social responsibility and sustainable development. These capabilities were developed through a new operational design (Table 3.6) that appeared to mitigate negative impacts of oil operational paradigm while enhancing the company's sustained competitive advantage in terms of lowering costs, pre-empting competitors, and securing the future position of the industry.

In another study in Spain, Leal, Fa and Pasola (2003) comparatively investigated the competitive advantage between a group of companies who did not apply any EMS and those that had already implemented EMS or were in the process of doing so. They concluded that on the whole, the companies without an EMS, saw only external benefits of EMS such as compliance with legislation and improved corporate image. On the contrary, companies with EMS not only believed in the external benefits but

simultaneously believed in internal benefits such as resource optimization, improved global management and control, and improved product quality.

Table 3.6: ***New Operational Paradigm Elements, Capabilities and Competitive Advantage***

Strategic capabilities	New operational paradigm elements	Competitive advantage
Environmental Management	• 'No road' approach • Offshore strategy • Minimize loss of biodiversity • Restoration	Lower costs
Social responsibility	• Stakeholder involvement • Limited contact with locals • Impact survey • Vaccinations	Pre-empt competitors
Sustainable development	• Community assistance • Social capital development • Environmentally sound technology • Long-term planning	Future Position

Source: Table 4 (p.277) - Hastings (1999) "A new operational paradigm for oil operations in sensitive environments". *Business Strategy and the Environment, 8*(5).

However, on the other side of the coin, environmental management proactiveness does not necessarily result in competitive advantage. According to Dechant and Altman (1994 p.15-18) there were two major areas of concern in particular - managing change and managing human resources. The prevailing view in many organisations was that profitability and environmental protection are mutually exclusive. Changing such a mindset requires a fundamental rethinking of traditional notions of disposability, risk, responsibility, and the right to pollute, which requires the involvement of people at the top of organisation. Managing human resources requires high level coordination, timely and adequate training of all employees on environmental issues, coupled with proper rewards according to the company's environmental performance.

A number of studies showed negative or non-correlation between environmental strategy and competitive advantage. Simpson, Taylor and Barker (2004) assessed the ability of SMEs in South Yorkshire, England, to create a competitive advantage by adopting environmentally sound practices. They found most SMEs in their study were unable to gain a competitive advantage by adopting such practices. Respondents held the view that at present customer satisfaction was not perceived to be related to environmental practice.

Taylor, Sulaiman and Sheahan (2001) investigated the perceived benefits of ISO 14001 certification at 84 sites of Australian companies and found both increase in competitiveness and improvement in the organisation's image had the highest degree of importance among respondents. The researchers argued that these two benefits were actually mere public image building. In addition, they also argued that the effect of gaining ISO 14001 certification on competitiveness seems to be refuted by their finding that low importance is given to the benefit of being able to comply with customer requirements, as this was ranked second last of the perceived benefits items. Certification of the system is perceived as for environmental performance itself.

In another study, Montabon, Melnyk and Sroufe (2000) studied the perceived impact of ISO 14000 on 1,510 respondents from various industries in the US. In the study respondents were asked to evaluate the impact of their EMSs on 14 dimensions of performance: core strategic areas of competitive advantage (cost, lead time, and market position); reputation and customer acceptance; product design and cost benefits assessment. Their study revealed a mixed picture of the impact of an EMS on overall corporate performance. On the positive side they found EMSs have not adversely affected the position in the market place, not compromised the products' acceptability from customers' perspectives, and have caused managers to explore more options when dealing with problems, especially the problems involving new technologies and procedure. But on the negative side, the systems have not helped management to reduce lead times, improve quality, or reduce costs - the primary factors that shape the firm's competitive position in the market place. Moreover, it is interesting to see that EMSs have not been perceived as increasing the capability of the firm to sell its products internationally.

The results of the above studies have shown that proactive environmental strategies do not always result in competitive advantage to businesses.

3.8 Summary

This chapter reviewed the relevant literature of environmental strategies, environmental effectiveness and competitive advantage. The first part introduced environmental strategies, their levels, typologies, and was followed by studies of stakeholders' pressure in relation to various strategies' proactiveness. The literature review indicated

that numbers of typologies of environmental strategies ranged from three to five. In these typologies, businesses were expected to go through reactive compliance to legislation at the lower extreme to leading business practices at the other high extreme. All these typologies were developed based on studies in developed countries; this shows the dearth of study of corporate environmental strategies in developing countries.

There were a number of studies that were conducted to measure how the threat or the importance of various stakeholders was perceived, and how this impacted on the proactiveness of various environmental strategies. The literature review indicated mixed results. A number of studies showed the more environmentally proactive companies perceived lesser threats from regulatory stakeholders, but other studies showed otherwise. The same mixed results were also observed for other stakeholders. Despite the inconsistencies about which stakeholders appeared to be impinging on different strategies, one important conclusion can be made: management of the more proactive companies tended to perceive wider threats from environmental stakeholders compared with reactive companies. The second part of the chapter discussed environmental effectiveness and its indicators. This part also reviewed previous studies on the relationship between environmental strategy proactiveness and environmental effectiveness. The literature showed two types of environmental effectiveness measurements - quantitative and qualitative. The former related to physical or empirical data, the latter related to semantic distinctions based on observation and judgement. Each has advantages and disadvantages.

The last part looked at a broader concept of competitive advantage, types of competitive advantage, as well as research on environmental strategy proactiveness and competitive advantage. The literature review indicated that although competitive advantage theory has existed for some time, only quite recently has the notion emerged that improved environmental performance is a potential source of competitive advantage. Many researchers argued that proactive companies enjoy competitive advantages in terms of more efficient processes, improvements in productivity, lower costs of compliance and new market opportunities, positive pressure group and compliance with environmental regulations. However, some researchers showed that proactive environmental strategies did not always result in a competitive advantage to businesses.

Chapter Four

The Development of the Malaysian Palm Oil Industry and the Environment

4.1 Introduction

Chapter One introduced the scope of this research project and chapters Two and Three reviewed the literature in the field, and developed a conceptual base for further search. The aim of this chapter is to discuss the evolution of the MPOI and the environment. The first section of this chapter looks at the growth of the MPOI and how it impacts on the environment. The role of various stakeholders, especially regulatory stakeholders, in pressuring the industry to be more environmentally responsible is also highlighted. Discussion of these themes is divided into two different periods: the colonial period before 1957, and the early period of independence (1957-1990).

4.2 The Palm Oil Industry

Palm oil is currently the world's second most consumed vegetable and it is expected to overtake soy oil in the very near future. It has a huge range of uses including in foods – particularly biscuits, margarine, frying oil, sauces, ice cream, mayonnaise, chips, chocolate and livestock feed - and in other derivative products - including soaps, shampoo, cosmetics, paints, detergents, and grease in the metal and leather industries. Recently, it has also been used as a bio-fuel to reduce dependency on carbon fuel.

The oil palm tree requires a wet tropical climate between 24 to 32 degrees centigrade. Oil palm produces fruits after three to five years of planting and after 20 to 25 years the trees need replanting. The fruits of the tree which grow in bunches yield between 10 to 35 tonnes per hectare and are harvested twice a month. Fresh fruit bunches (FFB) are processed at a palm oil mill close to the plantation to produce crude palm oil and palm kernel oil soon after harvesting. These are extracted and can be processed by a refinery into a wide variety of foodstuffs and other derivative products as mentioned earlier.

Apart from having suitable weather for oil palm plantations, over the past three decades the palm oil industry in the Southeast Asia, mainly in Malaysia and Indonesia, has experienced unprecedented growth due to a number of other reasons. First, there has been an increase in demand from customers, especially from developing countries, for palm oil due to its competitive price compared to other vegetable oils. As a result, palm oil consumption recorded a high growth rate of 7.9 per cent annually compared to soy oil growth of 5.6 per cent during the past 40 years (Basiron, Balu & Chandramohan, 2004 p.4). Second, oil palm is preferred to other vegetable oils because of its high productivity per unit area and lower operational costs. In terms of productivity of oil palm per hectare, it is about 7 and 2.5 times more productive than soybean and rapeseed respectively (Ming & Chandramohan, 2002 p.11). Palm oil production costs are also lower due to the lower usage of fertilizer and pesticides compared to soybean, sunflower and rapeseed. Third, the growth of the industry in Malaysia and Indonesia has been assisted by significant support from the governments. In Malaysia rapid expansion of the industry in the 1960s to 1980s was a result of the policies of the Malaysian government to reduce its economy's dependence on rubber. In order to achieve this, the government allocated vast areas of forest to be logged for oil palm plantations. Looking at the success of Malaysia in the palm oil industry, Indonesia followed suit and has aggressively promoted its own palm oil industry. The Indonesian government handed out vast areas of land to local business groups and foreign companies at cheap prices to stimulate the growth of the industry. Finally, development of the industry in South East Asia was also assisted by strong financial backing from international commercial banks – including Barclays, Royal Bank of Scotland as well as the World Bank. Some big Malaysian palm oil companies, who benefited and profited from the Malaysian government's policies in earlier decades, have used such finances to expand their businesses into Indonesia and other countries in Southeast Asia.

However, further increasing the production of palm oil in Southeast Asia will require more lands. Since suitable areas for oil palm are already becoming scarce, the industry has encroached further into tropical forests and other marginal lands. As a result the expansion of the industry is now associated with massive deforestation. This has far reaching consequences such as the depletion of flora and fauna and air and water pollution. It may also generate social conflicts, notably involving indigenous people who rely on the natural forests as their livelihoods.

The government and industry sources in Malaysia and Indonesia argue that there is very little destruction of tropical forest because palm oil plantations are usually located in areas that have been logged previously or they merely involve the replanting of rubber. But environmentalists and ENGOs have argued palm oil does have a significant impact on deforestation. According to Friend of Earth (FoE) nearly half of the oil palm plantations planted in Malaysia and Indonesia by 2002 involved some form of forest destruction (FoE, 2004b p.13). In is interesting to observe that due to the limitations of suitable land in Malaysia, in the late 1990s some big Malaysian palm oil companies have expanded large scale oil palm plantation into Indonesia, Papua New Guinea and the Solomon Islands. In the near future the growth of the industry will occur mostly in these countries with the significant present of Malaysian palm oil companies. If environmental degradation is not given due consideration in these countries, the industry will repeat the same cycle of deforestation that was experience in Malaysia and is currently being experienced in Indonesia.

4.3 The Colonial Period Before 1957

4.3.1 History of the growth of the MPOI

Oil palm has a long history in Malaysia. Like rubber, it is not a plant indigenous to Malaysia - is native to west and central Africa. The first introduction of the African oil palm to the South East Asia can be traced back to the four seedlings from Mauritius and Amsterdam that were planted in the Botanic Gardens in Java, Indonesia in 1848. Commercialisation of the oil palm in the South East Asia region was first established in Sumatra, Indonesia by M. Adrien Hallet, a Belgian agronomist (Tate, 1996 p.451). Oil palm was introduced to Malaya (later to become Malaysia[18]) from West Africa in the 1850s, at the same time as rubber, but was cultivated only as an ornamental plant as planters showed no interest in it (Ooi, 1976 p.268). The earliest development of a palm oil plantation in Malaysia was attributed to a Frenchman, Henri Fauconnier in 1911, who used seeds from Hallet's plantation in Sumatra to establish his own oil palm

[18] Malaya, what is today Peninsular Malaysia, gained its independent from Britain in August 1957. In 1963 Singapore and the two North Borneo states of Sabah and Sarawak joined Malaya to form Malaysia. Singapore left Malaysia in 1965. Today Malaysia consists of Peninsular (West) Malaysia and Sabah and Sarawak (East Malaysia). Altogether there are 13 states and each state has its own government led by a chief minister. Kuala Lumpur is the federal capital.

planting at Tennamaran Estate in Selangor to replace an unsuccessful planting of coffee (Tate, 1996 p.453). The commercialisation of the oil palm in Malaysia began in 1917, six years after Fauconnier's first plantation (Jackson, 1967 p.319).

The British administration played an instrumental role in encouraging the palm oil industry in the country in its early period - during the World Recession of 1920-1921. The falling price of rubber made the colonial administration acutely conscious of the need to reduce the country's over dependence on rubber as the mainstay of the economy. The administration helped the expansion of palm oil in two ways (Tate, 1996 p.457). First, it facilitated the acquisition of land for oil palm cultivation, such as setting aside 40,000 hectares of land for this purpose in 1927; and an allocation of land for oil palm cultivation was still made available during the height of the depression although the allocation of land for rubber planting had been banned. The second way was by encouraging the Department of Agriculture of the Federated Malay States (DAFMS) to conduct research into key aspects of cultivation and oil palm production and processing. Prior to that, the DAFMS research activities had revolved around the rubber industry.

The average size of oil palm plantations at that time was quite small – on average a couple of hundred hectares each – while the most prominent oil palm estate was Elmina Estate, in Selangor, in which over 1,000 hectares were under oil palms by 1923 (Tate, 1996 p.457). In 1924 Malaya recorded the first export of palm oil and kernel oil from its local plantations (Tate, 1996 p.455). The early expansion of oil palm plantations was marked in 1924 when the Guthrie Group - which has since become the biggest plantation company in Malaysia, bought up the small pioneering oil palm estates. In the 1930s there were 23,000 hectares of oil palms, mostly concentrated in the west coast of peninsula, mainly in the states of Johor, Selangor and Perak. By 1931, Guthrie expanded their oil palm planted area and became the agents for thirty-six plantation companies, with total of 4,200 hectares of land under oil palm. This amounted to about more than one-sixth of the total area planted with oil palms at that time (Tate, 1996 p.456). However, in 1930s the largest single stake held by a private company in the Malayan oil palm plantation industry was that of Hallet Group, which planted more than 8,800 hectares of oil palms by 1939. The interest shown by Guthrie and Hallet Group in the new palm oil plantation industry prompted other European companies to follow suit - one notable example was United Plantations. However, as in the previous decade, the

growth of oil palm plantations was hampered by a drastic fall in the price of natural oils in the world market. As for those who were already involved in the industry, two approaches were taken to address the problem: (1) cost reduction in plantation and transportation; and (2) improvement in efficiency through research and development.

As a result of intensive research conducted by both palm oil plantations and the DAFSM, coupled with the efforts taken by other players like distributors of palm oil, there were a number of breakthroughs in this period. The first breakthrough was the development of bulk transportation of crude palm oil. Such transportation reduced overall cost by S$4.00(Singaporean dollar) per tonne or more. To facilitate bulk transportation, Guthrie's subsidiary, Malayan Palm Oil Bulking Company, prepared special tank wagons for carrying the oil to Singapore via train from Selangor and Johor, at cheap and fixed prices. Moreover, Socfin's provision (a one time European plantation company) of transportation of crude palm oil via steamship from Port Swettenham (later known as Port Kelang) and Singapore, also contributed to this cost reduction (Tate, 1966, p.459). Secondly, there were several breakthroughs in research and development undertaken by plantation companies. Guthrie Group and other players, with backing by DAFMS, were involved in research into finding better ways to increase oil palm yields. In 1933 Guthrie's scientists succeeded in producing a high yield hybrid, *pisifera*, followed by another called *tenera* in 1939. This hybrid not only produced more palm oil but is also shorter than the native plant of Africa, helpful in harvesting fresh fruit bunches (FFB). In terms of mechanization, Guthrie Group led the industry as it first introduced hydraulic processes for oil extraction in 1929. Prior to that, extraction of oil only involved a simple mechanical apparatus operated manually. Mechanization not only produced optimum result in terms of oil extraction but it also reduced production cost in the long term, as it required less labour force (Tate, 1996 p.461-463). Overall, despite all these achievements, planting slowed during the 1930s to reach 32,000 hectares by 1941 on the Peninsula (Drabble, 2000 p.133). The Malayan palm oil industry in this period was still completely overshadowed by that of rubber, where the rubber planted area in 1940 in Malay Peninsular had already reached 1.539 million hectares (Drabble, 2000 p.53).

The oil palm industry's growth was delayed during during the Second World War (1941-1945). Estates, mills and their machinery had been destroyed, looted or damaged.

After the war the oil palm cultivated areas gradually continued to expand, and by 1950 the total area under oil palms was 38,800 hectares (Basiron & Weng, 2004 p.2). Much of the planting in this period occurred on former rubber and coconut land (Aiken & Leigh, 1992 p.55). Unlike figures for the acreage of oil palms, there was no reliable record on oil palm production during its early period (1920s to 1940s). Records exist which show that in 1950 and 1955 Malaysia produced 53,000 tonnes and 57,000 tonnes of palm oil respectively (Drabble, 2000 p.165), the production of Malayan palm oil was less than 10 percent of the world market of palm oil (Cho, 1990 p.69).

According to Tate (1996 p.581) two main factors contributed to the growth of palm oil after the war. First was the rapid expansion of the world market for vegetable and other natural oils. Second, the increasing awareness among planters that oil palm cultivation offered a better return on investment than rubber, with its faster maturation of three to four years, instead of six to seven years, and its higher price. Big European plantation companies, like Socfin, Guthrie, and United Plantations, which had already committed to oil palm plantation prior to the Second World War had no difficulty in replacing their rubber plants with oil palms. The oil palm plantations in the country during this period were still confined to estates, which were almost entirely European owned, principally because of the expensive technology necessary to process the fruit quickly after harvesting to prevent the build-up of free-fatty acid (FFA) (Drabble, 2000 p.133).

4.3.2 The Environmental Impacts of the MPOI

During British administration, in comparison with rubber, the environmental impact of oil palm cultivation was relatively small. In terms of deforestation, oil palm plantations contributed less to forest clearance. This could be easily judged from the smaller area planted with oil palms; for example in 1950, the total of area under oil palms was about 40,000 hectares, compared to about 1.5 million hectares of rubber – the oil palm area was only 3 percent of the total area under rubber. In addition, not all oil palm areas had been developed from forest clearance, some of the areas were replanting of rubber. However, it cannot be denied that oil palm plantations did impact on the environment. Forests were cleared to make way for oil palm plantations, and with the absence of vegetative covers, rainfalls easily eroded soil surfaces and excessive erosion was observed during land preparation. As a result, heavy sedimentation occurred in the

rivers, soil nutrients were also washed away during run-off. These activities continued for some time, mainly in the early stages (1 to 3 years) of oil palm plantations.

Another potential environmental impact of the palm oil industry was in downstream areas due to the processing of FFB. Since FFB needed to be processed as soon as possible to avoid accumulation of FFA, which would affect the quality of the oil, palm oil mills were established close to oil palm plantations. By 1934 there were twenty-two palm oil mills in the Peninsula; and they increased their numbers to about 50 in the 1950s (Tate, 1996 p.463). Because the mills required a high amount of water to process FFB - about one tonne of water to process one tonne of FFB - they were located near to rivers (Aiken, 1982 p.183). Palm Oil Mill Effluent (POME) contains very high organic matter content, as indicated by its high Biochemical Oxygen Demand (BOD) of 25000mg/l, which is about 100 times that of sewage. Rivers were not only the source of water but were also considered as dumping ground. Untreated POME was indiscriminately discharged into rivers, but with few mills around at that time and the quantity of POME released into rivers being quite small, organic compounds of POME decomposed naturally by microbes in the rivers (Vincent & Ali, 1997 p.328).

As far as environmental management was concerned, the palm oil industry benefited as a late-comer in the plantation industry. Many agricultural practices that were deemed necessary in oil palm plantations were learned from rubber plantations. One case in point was an effective way of addressing soil erosion. During the early days of rubber planting, weed clearing, which was standard practice in British arable farming and other countries in Europe, was widely practised in rubber estates. Later such a technique was found not to be effective in Malaya as it results in excessive soil erosion and depletion of nutrients. As Aiken (1982 p.122) put it:

> On many estates, particularly those on steeply soil land, the humus and topsoil were completely denuded, depriving the shallow-rooted rubber trees of their major sources of nutrients. In addition, high soil temperatures on cleanly weeded ground inhibited the growth of feeder roots in the upper part of the soil.

As a result of soil erosion and depletion of nutrients on many estates, large numbers of rubber trees stagnated or died. Over time, rubber growers learned that among others means, bunds and pits and cover crops were effective measures to address this problem. As for oil palm estates the above-mentioned techniques were universally practised to

avoid soil erosion in new plantations. Another technique to reduce soil erosion was terracing, which was introduced after the Second World War when earth moving equipment became widely available (Aiken, 1982 p.122-123).

Overall, both these crops area under cultivation against the area of rainforests in the Malay Peninsular, was relatively small; in 1935 about 80 percent of the peninsula was still under forest of some kind or another (Troup, 1940 p.380). According to Wyatt-Smith (1958 p.40) in 1958 about 74 percent of the land area of Malaya remained forested. During the entire colonial period (1824 to 1957) probably only about 20 percent of forest cover was eliminated (Aiken & Leigh, 1992 p.57).

From the above discussion it is clear that environmental issues like deforestation, soil erosion and water pollution were all considered as externalities. The oil palm growers did not concern themselves much about them. Measures were only taken to cope with those issues when they affected their oil palms. Soil cover crops and terracing were economically motivated, not because they were concerned about the environment *per se*. This is especially true for POME. It was considered as an externality, and nearby rivers were perceived as the 'commons' and treated as dumping grounds for POME.

4.3.3 Environmental stakeholders' pressure

Besides common agricultural techniques in the industry, a further main reason why oil palm growers had to pay attention to soil erosion at that time was as a result of legislative stakeholder pressure. The British administration had legislated various laws in the Malay Peninsula to address excessive soil erosion due to economic activities.. The legislation pertaining to soil conservation was first introduced in the Federated Malay States (FMS) was the Silt Control Enactment in 1917.. This enactment empowered the State Resident to take action against any person who allowed sediment eroded from his land to damage or interfere with the cultivation of neighbouring land. The Enactment was amended several times - in 1922, 1933 and 1937 - to increase the breadth and depth of the previous laws (Aiken, 1982 p.122-123). In addition, the Mining Enactment (1929), Forest Enactment (1934), and National Park Enactment, (1938) were also introduced by the British Administration. During this period various aspects of the environment were treated as separate entities and governed by different

authorities. The water act was under the authority of the Drainage and Irrigation Department (DID), forests and wildlife came within the purview of the Department of Forestry. These acts were managed by the relevant agencies, which went about their rather narrowly defined missions, guided by engineering and financial analyses, to achieve economic growth rather than for the cause of the environment *per se.*

It is believed that there was no environmental pressure from the public at this stage on the expansion of rubber and oil palm. Deforestation due to the expansion of such crops was not considered as a pressing issue by the public, their major concerns being the economy and physical development. Despite low public awareness of the environment, this period witnessed the establishment of the oldest Malaysian environmental non-governmental organisation (MENGO) - the Malaysian Nature Society (MNS). It was formed in the 1940s by small group of British nature lovers (Aiken & Leigh, 1992 p.121). Through the publication of the *Malayan Natural Journal*, the organisation called for better conservation of flora and fauna, and it also proposed rational conservation policies, including the creation of a comprehensive network of parks and reserves (Aiken & Leigh, 1992 p.121).

4.4 The Early Independence Period - 1957 to 1990

4.4.1 The growth of the MPOI

The new period of the MPOI and the environment began after the country gained independence from British administration on 31 August 1957. The expansion of the oil palm was largely attributed to the efforts of the Malaysian government. From the very beginning of independence, in the early 1960s the government called for a greater economic diversification strategy from rubber and tin to industrialization and other alternative crops. In relation to agriculture, oil palm cultivation was promoted by the government in order to reduce over dependence of the national economy on rubber and tin (Basiron & Weng, 2004 p.3), during this period, these two primary commodities accounted for more than 50 % of the country's GDP (Simeh & Ahmad, 2001 p.1). However, income from these two commodities had slumped: rubber faced declining prices as a result of a strong competition from synthetic rubber, and the demand for tin worldwide had fallen.

In 1960, the total planted area under the oil palm was only 54,700 hectares, and as in previous years, this was all under large estates; smallholders and government owned plantations were non-existent (Pletcher, 1991 p.625). Realising the benefits of the palm oil industry over rubber, coupled with encouragement from the Malaysian government policy on crop diversification strategy, private companies who had already planted oil palms prior to independence intensively converted their rubber plantations to oil palms and / or replaced their oil palms with higher yield hybrids. Beginning in 1962, they used the opportunity of replanting grants provided by the government to plant oil palms. The grant amounted to RM1860 (US$ 489.5) per hectare and was repayable over five instalments (Pletcher, 1991 p.627). By 1965, as a result of intensive replanting of old rubber areas, Guthrie was on the way to having 100,000 hectares under oil palms. This was followed by Socfin, which had about 26,000 hectares of oil palms. By this time both Harrisons & Crosfield, and Unilever, which had been involved in rubber plantations, had come onto the scene (Tate, 1996, p.582).

The Malaysian government not only encouraged private plantations to turn to oil palms, but it was also directly involved in the industry. A key driver for the promotion of MPOI in the country was the Federal Land Development Authority (FELDA), which was established by the government in 1956 with the socio-economic responsibility of developing plantation land for the landless and rural poor Malays.[19] The decision to promote palm oil plantations was parallel with recommendations made by the International Bank for Reconstruction and Development (IBRD) mission to the country in 1954 (Bahrin & Lee, 1988 p.3). The first planting of oil palms under the FELDA scheme was in 1961 in the Taib Andak Complex in Johor, Peninsular Malaysia and involved 8,100 hectares of land. In 1965 the total planted area under the FELDA increased to more than 11,000 hectares, or 11.4 percent, of total oil palm area (Pletcher, 1991 p.625).

The involvement of FELDA in oil palm plantations was boosted by a new economic strategy, known as the New Economic Policy (NEP), which was officially promulgated

[19] The economic activities of Malays were concentrated in low-productivity peasant agriculture and the public sector. Compared with other races (Chinese and Indians) Malays were disproportionately poor and were largely found outside the modern, urban and corporate sectors, with very few entrepreneurs or corporate manager among them. Gomez, E. T. and Jomo, K. S. 1997, *Malaysia's Political Economy: Politics, Patronage and Profits.* Cambridge University Press, Cambridge.

in 1971 in the Second Malaysia Plan, 1971-1975 (Malaysia, 1971). The NEP was an ambitious twenty-year plan (1970-1990) launched by the government after a bloody ethnic clash between Malays and Chinese in 1969. The two pronged objectives of this policy were: (1) to accelerate the process of restructuring Malaysian society and correcting economic imbalance and (2) to eradicate poverty by raising income levels and increasing employment opportunities for all Malaysians (Malaysia, 1971 p.1).

In line with the NEP, FELDA was directly involved in land development by establishing large oil palm and rubber plantation schemes as a vehicle to eradicate endemic poverty among Malays. Because the return from palm oil was found to be better than rubber, the former was preferable, however in FELDA plantations the schemes were a mix of both crops,[20] hitherto the two largest Malaysia commodities export. The landless people throughout Peninsular Malaysia were then placed as settlers in the newly opened FELDA land schemes, which were concentrated in the state of Pahang, Johor and Perak – these states had vast amounts of virgin forest available for oil palm cultivation. As a result, in the 1970s the total area of oil palms under FELDA was increased to 65,000 hectares or 24.1 percent of total oil palm planted area. FELDA's oil palms increased almost 6 times from 1965 to 1970. Table 4.1 shows area under oil palms in Peninsular Malaysia by sector in 1960 to 1970.

Table 4.1: ***Area under oil palms in Peninsular Malaysia by sector 1960–1970 ('000 hectares)***

	1960		1965		1970	
	Hectares	%	Hectares	%	Hectares	%
Private Estates	54.7	100	84.1	86.8	193.4	71.6
FELDA	0		11.1	11.4	65.0	24.1
Others*	0		1.7	1.8	11.6	4.3
Total	54.7		96.9	100	270.0	100

Note: *Includes the Federal Land Consolidation & Rehabilitation Authority (FELCRA), Rubber Industry Smallholders Development Authority (RISDA), state schemes and smallholders. No data available for these sectors prior to 1970.

Source: Pletcher, (1991) 'Regulation with growth: The political economy of palm oil in Malaysia', *World Development*, 19(6), p. 623-636.

On the other hand, in 1970, although more and more oil palm plantations had been opened up by FELDA, private plantations still dominated the industry, covering 193,400 hectares or around 72 percent of oil palm area in the Peninsula, having

[20] Although one of the diversification strategies was to reduce the economy's overdependence on rubber, this could not be done overnight, nor was it thought desirable to do so. Hence, rubber production was given official encouragement during this period because it still remained the primary source of revenue and export earnings (Tate, 1996 p. 587).

increased by more than doubled from 84,100 hectares in 1965. After 1970, FELDA[21] continued to expand its schemes across the country, expanding its role in Sabah (East Malaysia) through development of 136,000 hectares on the east coast (Jomo, Phang and Khoo, 2004 p.111). In 1980, the total planted area of oil palms under the schemes increased almost five-fold to 316,550 hectares or close to 30 percent of the total planted area in Malaysia. Similarly to FELDA, private plantations also expanded their oil palm planted area; in 1980 the area of oil palm plantations under private ownership was 557,659 hectare or 52.1 percent of the total area of plantation in the country (MPOB, 2005). Though private plantation estates enlarged their plantation size during this period, they could not match the expansion of FELDA.. This was mainly due to the difficulty of acquiring new land for planting oil palms. It should be noted that between the 1960s and the 1970s private plantations which were largely owned by the European companies were denied new land except in rare circumstances. On the contrary, FELDA as the government body had disproportionate access to virgin land (Jomo *et al.*, 2004 p.29). As a result, most new planted areas in private plantations were from replanting of rubber trees areas and/or the acquisition of smaller plantation companies.

Besides these two major players, since the 1970s independent smallholders and state schemes, run by various state agencies across the country, have also come onto the scene. However, the total percentage of each of these oil palm plantings was relatively small, less than 10 percent. Prior to the 1960s, the non-existence of small independent smallholders was due to difficulties in processing their FFB, but when palm oil mills became accessible, either those owned by private plantation companies or independent palm oil mills, this facilitated processing their FFB. Table 4.2 shows total planted area and production of crude palm oil rose rapidly from 1960 to 1980. The oil palm planted area increased substantially from 54.7 thousand hectares in 1960 to 1.023 million hectares in 1980 - nineteen-time increase in just two decades after independence. The same was observed about crude palm oil (CPO) production, which increased almost four-fold from 92 thousand tonnes in 1960 to close to 2.4 million tonnes in 1980.

[21] FELDA's role has been immense: financially, it is the largest and most important public agency in Malaysian agriculture. For instance, under the Second Malaysia Plan (1971-1975) just under 13 per cent of total government expenditure and slightly more than half of total agricultural expenditure went into land development, most of it through FELDA (Jomo *et al.*, 2004 p.29).

The FELDA land development schemes for oil palms continued in the Fourth Malaysia Plan (1981-1985) and the Fifth Malaysia Plan (1986-1990) when the total areas developed were 161,600 hectares and 175,500 hectares respectively. In 1990, the total area of FELDA scheme under oil palms increased to 608,100 hectares or 30 percent of the total planted area in Malaysia, almost all of which was originally heavy forested (Table 4.3). In addition, the private plantation companies also increased their oil palm planted area from 557,659 hectares in 1980 to 912,131 hectares in 1990. The percentage of total planted area under private plantation in 1990 was about 45 percent. As with previous decades, the expansion of private plantation companies in the Peninsula was largely due to replanting of oil palms on defunct rubber plantations. However, it is a different situation in Sabah, where, since late the 1980s, several forays have been made by private companies from Peninsular Malaysia into the plantation sector, with the involvement of major private companies such as KL-Kepong and Golden Hope.

Table 4.2: ***Total Planted Area and Production of Crude Palm Oil in Malaysia, 1960 to 1980***

Year	Total Planted Area ('000ha)	Production of CPO ('000tonnes)
1960	54.7	92
1965	92.9	122
1970	106.7	402.3
1975	641.8	1,136.8
1980	1,023.2	2,396.7

Source: Tables 2 & 3, Pletcher (1991), 'Regulation with growth: The political economy of palm oil in Malaysia'. *World Development*, 19(6), p. 623-636.

Table 4.3: ***Distribution of Oil Palm Area by Sector in Malaysia by sector (1980-1990)***

	1980		1990	
	Hectares	%	Hectares	%
Private Estates	557,659	52.1	912,131	44.9
Government Schemes				
FELDA	316,550	29.6	608,100	30.0
FELCRA	18,851	1.8	118,512	5.8
RISDA	20,472	1.9	32,582	1.6
State schemes	67,281	8.0	174,456	8.6
Smallholders	70,446	6.6	183,683	9.1
Total	1,051,259	100	2,029,464	100

Source: The Malaysian Palm Oil Board (http://www.mpob.gov.my, accessed on 10 July 2005)

As a result of intensive cultivation from both FELDA and private plantations in 1985 palm oil overtook rubber to become the largest single commodity in agricultural output,

the value of palm oil and rubber export were RM 3,944 and RM2,864 million respectively. The percentage of exports of palm oil against total commodity export increased to 10.4 percent in 1985 compared to 8.9 percent in 1980. In contrast, the percentage of rubber exports slipped from 16.4 percent in 1980 to 7.5 percent in 1985 (Cho, 1990 p.21).

4.4.2 The Environmental Impacts of the MPOI

From the economic point of view, oil palm was not only a source of income for FELDA settlers, it also brought economic wealth and rural development across the country. Palm oil significantly contributed to Malaysian foreign exchange. However, from an ecological and social point of view, the onslaught of the palm oil industry contributed to increasing deforestation, the depletion of flora and fauna, soil erosion, air and water pollution, and threatened the life of local communities, aboriginal communities who depended on rivers as a water source and for their income.

It is interesting to note that in 1966, a decade after independence, close to 70 percent of Peninsular Malaysia was still under forest (Ooi, 1976 p.89). However, oil palm plantations reduced forest areas dramatically, and according to Cho (1990 p.106), between 1966 and 1978 the areas of primary forest on the Peninsula decreased by 15 percent. The extensive areas of virgin forest in sparsely populated regions, such as central and southeast Pahang, were cleared for FELDA schemes. From 1961 to 1980 total clearance of tropical rainforests by FELDA was almost 1 million hectares, out of which more than 300,000 hectares was planted with oil palms (Henson, 1994 p.4).

Further depletion of rainforest ensued in the 1980s due to the expansion of oil palm plantations. It was reported that annual rates of tropical deforestation in Malaysia in 1981 to 1985 and 1989 were 250 km^2 and 480 km^2 respectively; and Malaysia was one of the countries which experienced the fastest deforestation in the world (Aiken & Leigh, 1992 p.11). Some 1.36 million hectares of forest were lost between 1966 and 1984 alone (Jomo *et al.*, 2004 p.85). As a result of deforestation[22], mainly due to land

[22] The three major drivers of deforestation in Malaysia were the timber industry, shifting cultivation and agri-conversion to permanent cultivation of cash crops on private estates, and government-funded land development schemes (Bryant, 1992).

development schemes, by 1990 only about 42 percent of forest was left in Peninsular Malaysia (Aiken & Leigh, 1992 p.69). Much of the frontier region east and south of the Main Range in the Peninsular had been transformed by land development schemes. In little more than two decades, vast areas of forests had been replaced by uniform, serried rows of plantation crops that now marched endlessly across the country's landscape.

Jungle clearance in the early post independent period had been greatly facilitated by the availability of machinery. Trees were felled with chain saws or toppled by bulldozers. Commercially valuable logs were then removed, and to make way for oil palm plantation the remaining vegetation was bulldozed into heaps and burnt. Open burning was widely practised as it was the cheapest and fastest way for land clearing. In addition, to gain economies of scale, extremely large-scale areas were cleared in one operation. This was compounded by a lack of scheduling of clearing operations for the predictably drier months (Aiken, 1982 p.169). Although terracing and planting of cover crops were widely practised to curb soil erosion,[23] frequently, there was a considerable time interval between the completion of clearing and terracing and the planting of cover crops. During this phase rainfalls on the large extent of bare ground caused excessive erosion and sedimentation, as well as losses of soil nutrients in the area.

It cannot be denied that terracing and cover crops managed to reduce soil erosion in oil palm plantations, but they were not as efficient as rainforest ecosystems. In the 1970s and the early 1980s there were a number of studies conducted to measure the effectiveness of rainforests and oil palm cover in relation to soil erosion. The generally dense evergreen rainforest vegetation acted as an effective mechanism to capture a large quantity of rain – the capture rate ranging from 21.8 percent to 36.0 percent (Low, 1972, cited in Aiken & Leigh, 1992 p.41). As a result of this rain capture, the volume of soil erosion and run-off were low in forest areas, where according to Henson (1994 p.12) the erosion rate in natural forests was between 0.03 to 6.2 tonnes/ha/year. Although the use of cover crops were universally practised and steep slopes were invariably terraced in oil palm plantations in Malaysia, rates of soil erosion in palm oil plantations were found higher than from rain-forest slopes. For example, a study conducted by Maene *et al.*

[23] Ministry of Agriculture of Malaysia recommended that all slopes between 11° and 18° should be terraced, and that slopes steeper than 18° should be left uncultivated (Aiken, 1982 p. 173).

(1979, cited in Henson, 1994 p.13) found that in an eleven years old oil palm plantation, with 5 degrees of slope, the erosion rates were between 1.1 to 14.9 tonnes/ha/year. This meant a soil erosion rate in areas that were under oil palm crops of between 3 to 42 percent higher than in natural rain forests.

During the early post-independence, the expansion of the palm oil industry in Peninsular Malaysia was also accompanied by the widespread, and indiscriminate use of herbicides and insecticides, as there were no regulations pertaining to the practice in the 1950s and the1960s. Widespread use of pesticides not only killed insect pests and weeds but also had effects on fish and bird life, as well as on humans. The blanket usage of pesticides also killed the natural enemies of insect pests. For example, during the 1950s oil palm trees on some estates were sprayed with DDT, Dieldrin, and BHC to control relatively minor attacks by pests (Aiken, 1982 p.178). Subsequently, many estates were invaded with bagworms that caused substantial crop loss. The spread of the bagworms was due to broad-spectrum chlorinated hydrocarbons that had killed the bagworms'natural enemies. In 1962, Integrated Pest Management (IPM) was introduced by Brian Wood from Guthrie Group (Tate, 1996 p.594). Unlike traditional confrontational approaches to pest epidemics, which rely on the blanket use of chemicals, this technique uses an ecological approach based on a study of the dominant features of the pest, using knowledge of the local situation, and exploiting natural processes in population regulation (Tate, 1996 p.594). Since then, IPM has been widely adopted in oil palm plantations in the country. Later, the Pesticides Act of 1974 was introduced to control the importation, manufacture, and marketing of pesticides.

Another negative effect of oil palm plantations was the reduction of fauna. According to Salleh and Ng (1983, cited in Teoh, 2000 p.63) plantation crops lack a multi-layered structure and were low in biodiversity. Monoculture plantations created an environment that was very different from that of natural forest; the uniformity of the plantation crop and the regularity in spatial distribution create a monotonous environment impoverished in variety and life. As a result oil palms could only support 17 percent of species of mammals found in the tropical rainforest (Salleh & Ng, 1983, cited in Teoh, 2000 p.26). Although some animals managed to survive in oil palm plantations, they frequently came into conflict with humans in and around the plantations. Workers and villagers encountered elephants, Orang Utans, tigers, porcupines and wild boar for some time

after forest clearing. More often than not, in such an encounter, animals perished at the hand of humans. For example, between 1966 and 1976 the state game departments shot some 120 elephants (Khan, 1977, p. 28 cited in Aiken & Leigh, 1992 p.94).

In Peninsular Malaysia, land development schemes, and other activities that took place within aboriginal areas in the 1970s destroyed forest ecosystems and placed very greater pressure on the land and life of the *Orang Asli*[24] (Aiken & Leigh, 1992 p.100). The land development schemes reduced the amount of land available to them. As the *Orang Asli* depended on forests as a source of food, through hunting and gathering and shifting cultivation, a smaller amount of forest lands reduced the extent of traditional territories to fulfil their basic needs. Moreover, deforestation made them vulnerable to interference from outsiders and greater exposure to the market economy.

On the downstream side of the MPOI, there were two main sources of environmental concern associated with palm oil mills - air and water pollution. Two principal sources of air pollution were the incinerators and the boilers. The former burned empty fruit bunches (EFB) for recovery of potash as source of fertilizer in the oil palm plantations. While, in the latter, waste fibre and shell materials were burnt to produce steam to sterilise FFB. The dark smoke and dust emissions from these two sources polluted the environment.. In the 1970s and the early 1980s various concerned citizens complained to the DOE about air pollution from palm oil mills. By the early 1970s the increasing number of oil palm plantations led to the growing number of oil palm mills. In 1974, there were 70 palm oil mills in Peninsular Malaysia, and by the early 1980s there were more than 100 of them (Aiken, 1982 p.183). These moderately sized mills were scattered across countryside. On average, a mill generated 2.5 tonnes of effluent for every tonne of CPO produced and as previously, palm oil mills disposed of effluent by discharging it, untreated, into the nearest body of water (Ma *et al.*, 1980, cited in Vincent & Ali, 1997 p.328). Because of the large volume of POME from these mills, in the early 1970s, crude palm oil mills were the worst source of water pollution in the country (Maheswaran & Singam, 1977, cited in Vincent & Ali, 1997 p.320).

[24] The official term for the aborigines of Peninsular Malaysia is 'Orang Asli'. They are divided into 3 different ethnic groups: the Negritos, the Senoi and the Protos - Malays. The Orang Asli were estimated to number about 72,000 in 1990. They are under the protection of a special department, the Department of Aboriginal Affairs (JHEOA) (Ibrahim, 2000).

By mid 1977 it was reported that 42 rivers in Malaysia were severely polluted, and palm oil mills were mainly responsible for the widespread pollution in rural areas. Aiken and Moss (1976, cited in Aiken, 1982 p.183) reported that fish numbers had been drastically reduced in a river downstream of a palm oil mill in Selangor and people who lived along the river banks no longer drew water for domestic purposes from the river. Table 4.4 shows the BOD load generated by Malaysian crude palm oil mills and its population equivalent, from 1960 to 1978. In 1978 there were 131 oil mills in the country and in that year the highest BOD load was emitted by palm oil mills throughout Malaysia where 563 tonnes/day were discharged into rivers (ESCAP, 2002). This figure was equivalent to the pollution generated by a population of more than 16 million, dramatically more than the actual Malaysian population at that time of around 11 million. The polluted rivers not only affected those who depended on them as a source of drinking water but also raised the costs of treating water to meet municipal standards. As a result, CPO mills were the major source of water pollution complaints to the government from 1974 to 1978 (Vincent & Ali, 1997 p.329).

Table 4.4: ***Pollution from Crude Palm Oil Mills in Malaysia***

Year	1960	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978
BOD load generated (tonnes/day)	30	48	138	186	230	256	329	396	436	508	563
Population Equivalent ('000)	600	960	2,760	3,720	4,600	5,120	8,000	10,150	12,000	14,150	15,890

Source: (http://www.unescap.org/drpad/publication/integra/volume3/malaysia/3my000ct.htm, accessed on 25 June 2005)

That the agricultural development onslaught under FELDA gave little or no consideration to the environment was admitted by Malaysia academics, Bahrin and Lee (1988 p.230), who stated:

> Being the foremost land developer in the country, FELDA cannot shirk the issue of creating instability in the ecology and environment in the country. Large scale land clearance has brought about adverse environmental effects such as deforestation, soil erosion, flooding and disruption to the existence of the country's wildlife … Whereas in the past FELDA and the government have been allowed the usual socio-economic considerations as excuse, increasing public awareness and concern would seriously demand a different and more acceptable explanation.

As far as the environmental legislation was concerned, in the 1980s the DOE imposed further pressure on palm oil mills when it reduced levels of BOD of POME from 250 mg/l in 1982 to 100 mg/l in 1984. These lower levels reflected increased environmental

standards imposed by the DOE in order to address the environmental issues pertaining to the MPOI.

In terms of performance in compliance of palm oil mills with the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977, by the mid 1980s the average was around 80 percent. Even though the act had been established for a decade, full compliance had not materialized. The problem with the MPOI was that the majority of palm oil millers preferred to use ponding as the treatment system of POME (Ma and Ong, 1985, cited in Khalid & Mustapha, 1992 p.281). Although this system was reliable, stable, and capable of producing good quality final discharge with a BOD - with less than 100 mg/l - pond maintenance was labour intensive and required adequate control and monitoring. Those in charge needed to ensure that as little oil as possible was allowed to flow into the ponds. If not, the oil would agglomerate; with the rising solids brought up by the biogas forming a sticky scum which was difficult to remove. Moreover, solids build up at the bottom of the ponds also needed to be reduced; excessive solids build-up at the bottom reduced the effective digestion capacity and shortened the retention times, which adversely affected the treatment efficiency of the system (Khalid & Mustapha, 1992 p.281).

By the mid of the 1980s other effluent treatment technologies that were more efficient, more reliable, and less maintenance and labour intensive were available. For example, the open tank digester and extended aeration system, and the closed anaerobic digester, and land application (Khalid & Mustapha, 1992 p.281). However, the MPOI still preferred the ponding system, possibly because it was the cheapest compared to other treatment systems[25].

In the 1970s, the treatment of POME was regarded as a burden to the millers as it was an investment with no financial returns, however in the 1980s this kind of attitude started to change as they found that POME could be used as fertilizer. At that time, due to research and development (R&D) in both private companies and the Palm Oil

[25] According to Khalid and Mustapha, the capital cost for a ponding system for a 30t FFB per hour mill is about RM330,000; the capital cost for open tank digester and extended aeration system for 20 tonne FFB per hour mills is about RM600,000; and the cost for anerobic digesters to handle the effluent from a 60t per hour mill is approximately RM950,000 (Khalid & Mustapha, 1992).

Research Institute of Malaysia (PORIM), technology was made available to convert POME into useful by-products as animal feed and fertilizer, as well as being a suitable source of energy (Khalid & Mustapha, 1992 p.283).

POME could be used as fertilizer through land application, which became a standard practice in the 1980s for mills located in oil palm plantations (Ngan, 2000 p.1449). Apart from reducing water pollution, land application of POME also increased crop yield. For example, it was reported that land application of POME with BOD less than 5000 mg/l increased crop yield by 10 to 24 percent (Tam *et al*., 1982, cited in Khalid & Mustapha, 1992 p.283). In most cases, the nutrients from POME had totally replaced the organic fertilizers needed under normal agronomic practices. This resulted in substantial savings in fertilizer costs and increased incomes from higher FFB yield.

Additionally, in the 1980s a decanter-drier system, or a pollution prevention process, was introduced to the palm oil industry to reduce the volume of clarification sludge of POME by 75 percent. The solid phase, with about 82 percent moisture, could be subsequently dried and produced palm oil meal suitable for animal feed (Jorgensen, 1982, cited in Khalid & Mustapha, 1992 p.283).

Besides investigation into POME, research conducted by PORIM and private plantations also found better ways to utilise EFB. In the past they were burnt for their ashes and used as fertilizers. Such a practice caused air pollution. The researchers of the organisations found EFB could be used as mulches in the palm oil plantations, and they could be easily composted for use as fertilizer (Khalid & Mustapha, 1992 p.283).

4.4.3 Environmental Stakeholders' Pressure

As far as legislation was concerned, law pertaining to soil erosion in Malaysia existed in the early years of independence. The Federal Land Conservation Act 1960 was introduced to amend the Soil Erosion Act, 1937 to control soil erosion; the new act empowered the authorities to take action against land owners whose activities caused an excessive soil erosion and stream siltation. This Act was then immediately adopted by all states in Peninsular Malaysia. Even though the provisions of the Land Conservation Act 1960 would appear to be more than adequate for the general control of soil erosion,

and cultivation in areas of steep terrain, the lack of an enforcement mechanism by the authorities at a federal level made the act ineffective (Aiken,, 1982 p.260). The same was also observed at a state level, where the district officers of land revenue did not carry out any enforcement, as they generally had little or nor training in agriculture or soil conservation and in any case were usually fully occupied with work more directly related to their position (Aiken, 1982 p. 261).

In 1974, the Environmental Quality Act (EQA) 1974 was legislated by the parliament, and followed by the establishment of the Unit of the Environment in 1975 (Jaafar, 1998 p.11). The introduction of the Act is considered as a watershed for the environmental cause in Malaysia. The previous legislations were the issues based or 'piecemeal', and failed to look at the environment in the broader context. The new Act provided the legal framework for a coordinated environmental management programme in the whole of Malaysia. The Unit (later Department) of Environment was a part of the Ministry of Science and Technology. The Director General (DG) and Environmental Quality Council (EQA) were responsible for advising ministers on the environmental matters. Among others, the DOE functions encompassed the prevention, abatement, and control of pollution, and enhancement of the quality of the environment. It was also charged with the enforcing the Act (Guba, 1995 p.17). However, not all its jurisdiction related to palm oil industries activities, only encompassed issues relating to pollution, including going after factories discharging waste illegally, vehicles emitting excessive smoke or matters related to disposal of toxic waste. Under Article 74 of the Constitution of Malaysia, land, forests and rivers came under state jurisdiction and legislative powers rested with the individual state governments (Aiken, 1982 p.248). In other words, the state governments, not the federal government, have the final say over matters related to land, forests and water in Malaysia. This has made environmental regulation in Malaysia cumbersome and ineffective in addressing environmental degradations.

At the time of its formulation, the sole concern of the EQA was to address the pressing pollution problems arising from industrial discharges and emissions on land, water and the atmosphere. Unlike developed countries, the main emphasis of the DOE was on the protection of public health and safety (Ibrahim & Keng, 2003 p.55) rather than for the sake of the environment *per se.* According to Aiken (1982 p.265) the Malaysian government introduced environmental legislation during this period because of rapid

discernible deterioration in environmental quality in many areas, and due to pressures from the public and ENGOs. An increasing number of the middle class population, especially from urban areas, also exerted considerable influence on the government to address environmental issues. They expressed their dissatisfaction and complained about environmental degradations due to the onslaught of development. The early 1970s witnessed the birth of ENGOs in the country. They not only highlighted the environmental issues in order to increase awareness among public at large, but also lobbied the government to introduce environmental legislation and to create an environmental department, to put pressure on industry to address environmental problems which had arisen as a consequence of environmentally unfriendly activities.

Roque (1986 p.154), on the other hand, believed the government established the environmental legislation mainly due to external pressure. He argued that in the West, environmental policies and programmes resulted from demands by the general populace (i.e. 'bottom-up' initiatives). In contrast, environmental policies and programmes created in Malaysia, as well as in other developing countries since the mid 1970s, had largely been 'top-down' initiated by the governments themselves, not because governments perceived these were a necessity but as a response to the Western developments in environmentalism. Among the most significant of these influences were the international peer pressure to respond to environmental problems, particularly as articulated at the 1972 Stockholm UNCED, and efforts by bi- and multi-lateral development agencies to promote environmental protection through their loans and aid programmes such as the UNEP and the World Bank.

Although developing countries, including Malaysia, legislated environmental laws and established the DOE in the 1970s, at the same time as their developed countries counterparts, they faced a much more difficult challenge in addressing environmental issues since they had to contend with powerful development interests. As a result, environmental agendas tended to be based much more on protecting livelihoods with a dependence on the natural resources rather than on the ideas of conservation, protecting wild lands, protecting endangered species, and biodiversity, which motivate Western environmentalists (Boyle, 1998 p.104).

Even though the DOE was established in the 1970s to look after the environment, it failed to bring soil erosion under control in the FELDA schemes (Lowry & Carpenter, 1985 p.246). This is not surprising since, as was mentioned earlier, the government priority was more on social and economic agenda. As a result the DOE was less powerful and given a lower ranking than other ministries and mission agencies which were responsible for development meant to alleviate poverty and increase living standards of Malays. Lowry and Carpenter (1985, p.246) argued that in Malaysia as well as other developing countries, factors affecting the environment, conservation, or sustainable use comprised only one type of policy consideration. They should not dominate the process any more than any other objectives (e.g., economic growth, national security, income distribution or full employment). The decision for economic prosperity, under the mission of the Land Development Authority or Ministry, in this sense would easily obscure, dilute, or distort the objective of sustainable use. In this regard, a lower level agency like the DOE was at a hierarchical disadvantage in commenting on the environmentally unfriendly practices of the said ministry.

Although the DOE was seen as unsuccessful in halting deforestation and soil erosion that ensued after deforestation, it was considered successful in addressing river pollution due to POME. It was recorded that as soon the DOE was established it formed an expert committee with representatives from both the industry and government (Maheswaran & Singam, 1977, cited in Vincent & Ali, 1997 p.330). The committee was responsible for investigating possible treatment technologies available, and to advise the DOE on regulations. At that time there was no technology available elsewhere in the world to treat POME as other countries did not face the problem. Nevertheless, in developed countries there were systems to treat similar types of organic waste which involved a series of treatment ponds. Waste got cleaner and cleaner as it proceeded from one pond to the other. In order to avoid high costs involved, the industry's strategy was to adopt these systems. Since such a technology seemed economically viable and applicable for POME treatment in the country, the DOE announced the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations on July 7, 1977 (Maheswaran, 1984, cited in Vincent & Ali, 1997 p.330).

The key parameter of measurement of POME is the level of Biochemical oxygen demand or BOD. Table 4.5 shows the standards for the BOD in relation to POME, and

the effective dates for compliance by palm oil mills. From the establishment of the regulation the DOE gave only one year for palm oil mills to reduce untreated POME with BOD level of 25,000 parts per million (ppm) to standard A - i.e. 5,000 ppm. The BOD level of POME would then be reduced from year to year, and in four years time, palm oil mills needed to have reduced their BOD level to 500 ppm, which, however would not be the final one. If a licensee fails to comply with the terms and conditions of a licence, he is guilty of an offence and will be subjected to a fine not exceeding RM10,000, or to imprisonment for a period not exceeding two years, or both, and is further subject to a fine of RM1,000 for every day that the offence is continued after a notice has been served upon him (Nor, 1999 p.263).

Table 4.5: ***Biochemical Oxygen Demand (BOD) Standards for Palm Oil Effluent***

Standard	A	B	C	D
Date Effective	July 1, 1978	July 1, 1979	July 1, 1980	July 1, 1981
Level (ppm)[a]	5,000	2,000	1,000	500

[a] ppm – part per million (mg/l)

Source: Table 10.1 - Vincent, J. R. and Ali, R. M. 1997, *Environmental in a Resource-Rich Economy: Malaysia under the New Economic Policy*. Harvard Institute for International Development.

In another development, in order to control air pollution, the DOE introduced the Environmental Quality (Clean Air) Regulations 1978. There were two areas where the MPOI is subject to this regulation. In the upstream sector, it related to open burning. Under the regulation, agricultural burning practices were allowed under normal circumstances, provided that those who intend to carry out agricultural burning practices notify the nearest the DOE state office to assist and to guide any person carrying out agricultural burning practices. However, permission for such a practice could be revoked in the event of any undesirable occurrence, in order to safeguard public health and safety, for example, on occasions of a severe haze problem (Nor, 1999 p.263).

In the downstream sector, palm oil mills were subject to air emission standards, Regulations 15 and 16 of the Clean Air Regulations, prescribed for solid fuel boilers and EFB incinerators. According to the regulation, the emission of dark smoke from a solid fuel boiler chimney which is more than the density equivalent to No.2 on Ringelmann Chart is only allowable if not exceeding 5 minutes within an hour or 15 minutes in 24 hours, and the particulates in the emission should be less than 0.4 g/Nm^3 (Aiken, 1982; Nor, 1999 p.263). Thus, the regulations required palm oil millers to obtain written approvals for installation of incinerators, fuel burning equipment and

chimneys. Applications must be accompanied by relevant information and engineering drawings of the proposed installation as well as details of its pollution measures.

In general, the MPOI had a negative attitude towards the environmental legislation imposed on them during this period. For them imposition of such laws would impose more costs, and make the industry less competitive. The negative attitudes of palm oil industry players at that time towards the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977 was characterized by the following argument by one of their engineers, when he said:

> What is quite clear at this stage is that there is no single generally applicable solution [treatment systems] that is proven on a large scale, over an acceptable period of time…There can be little doubt that the limits for discharge will be very difficult to meet, except at costs incompatible with the economics of operating a mill, unless there are unforeseen advances in technology (Wood, 1977, cited in Vincent & Ali, 1997 p.331).

The DOE realised it was impossible to reduce BOD levels as stipulated because it would take some time for the industry to install treatment systems which were deemed suitable. The DOE used the polluter pays principle (PPP) or market based instruments (MBIs) to encourage members of the palm oil industry to reduce their POME levels in 1978. Palm oil mills were given two options: either treating effluent to reduce the BOD load in their effluent to meet the prescribed standard, or paying licence fees according to quantity of BOD discharge. In the first year of the implementation of the Act, almost all palm oil mills opted to pay fees (up to RM150,000 or US$39,474) instead of implementing the currently available technology (Khalid & Braden, 1997 p.27). During that year the DOE collected a substantial amount of revenue from licence fees - RM2.8 (US$0.74) million (Vincent & Ali, 1997 p.334). Since the result was disappointing from a compliance and environmental point of view, the DOE made it compulsory to comply with Standard B, and the subsequent standards were mandatory. It gave a strong signal of its willingness to take strong measures to enforce the standards - in November 1979, the DOE suspended a licence of a mill on the Sungai Langat, Selangor and from 1981 to 1984, it also took action against twenty seven mills (Vincent & Ali, 1997 p.334).

Table 4.6 shows BOD load reduction in the crude palm oil industry after the introduction of regulation from 1978 to 1985. Due to the regulation, pollution from

palm oil mills were no longer considered as a major problem, complaints against palm oil mills diminished too - more of less 80 percent of mills complied with the standards.

Table 4.6: ***Biochemical Oxygen Demand (BOD) Load Reduction in the Palm Oil Industry, 1978-1985***

Year	1978	1979	1980	1981	1982	1984	1985
BOD Standard applicable (mg/l)	5000	2000	1000	500	250	100	100
Crude Palm Oil Production (1,000 tonnes)	1,786	2,188	2,573	2,822	3,511	3,715	6,057
BOD Generated (tonnes/day)	563	690	850	1,000	1,100	1,640	1,693
BOD Discharged (tonnes/day)	563	222	130	58	5	4	5
Percentage reduction in BOD discharged	0	67.8	84.7	94.2	96.8	99.8	99.7

Source: (http://www.unescap.org/drpad/publication/integra/volume/malaysia/3my04co2.htm, Assessed on 15 August 2005)

This example shows a regulatory measure was the main motivator for the adoption of environmental management practice in the country. POME waste which was considered as an externality in the past had been internalised by the MPOI as a result of environmental legislation. Although palm oil companies abide with the new regulation, the treatment of POME was largely regarded as a burden to the millers as it was an investment with no financial returns (Khalid & Mustapha, 1992 p.283).

Another new development in environmental legislation in Malaysia in this period was the introduction of the Environmental Impact Assessment (EIA) legislation in 1988 (Peter, 1998 p.266). Actually EIA had been proposed in Malaysia since the late 1970s as a tool in project planning (Peter, 1998 p.276). But legal requirements for EIA became mandatory a decade later, effective from 1 April 1988 (DOE, 1987). The legislation was made under the provisions of section 34A(1) of the EQA, 1974 which states that: 'The Minister, after consulting with the Council, may, by order, prescribe any activity, which may have significant environmental impact as a prescribed activity' (DOE, 2003b p.2-1). In addition, section 34A(2) of the EQA, 1974 provides that:

> Any person intending to carry out any of the prescribed shall, before any approval for the carrying out of such activity is granted by the relevant approving authority, submit a report to the Director General. The report shall be in accordance with the guidelines prescribed by the Director General and shall contain an assessment of the impact such activity will have or is likely to have on the environment and the proposed measures that shall be undertaken to prevent, reduce or control the adverse impact of the environment (DOE 2003b p.2-2)

Of the nineteen activities prescribed by the order, the areas that may potentially relate to the palm oil industry specifically, and to agricultural activities in general, are prescribed activities as specified under: (1) Land development schemes covering an area of 500 hectares or more, to bring forest land into agricultural production; (2) Agricultural programmes necessitating the resettlement of 100 families or more; (3) Development of agricultural estates covering an area of 500 hectares or more involving changes in type of agricultural use; and (4) Conversion of mangrove swamps for agricultural use covering an area of 50 hectares or more.

Since the introduction of the regulation, any oil palm plantation that falls under one of above-mentioned items has been required by the DOE to submit an EIA report. Among other things, oil palm plantations need to include in their report the perceived impact of their activities on the environment, in relation to air, water, flora and fauna. In addition, in the report they need to propose mitigation measures to minimise the environmental impact of their projects (DOE, 2003c).

From the government point of view the EIA was a preventive measure taken to address environmental issues, as the likely impact of a project on the environment would be studied in advance, and mitigation measures would be proposed to deal with it. The onus on monitoring projects for compliance with the terms and conditions of approval by the DOE was on the developers. By doing this, the government believed businesses should be responsible for the environment in which they operate. On the contrary, however, businesses in Malaysia had a different view. In general EIA was looked upon by the industry as another bureaucratic obstacle, rather than a tool for decision-making (Nor, 1991 p.137). It comes as a no surprise to see many of them opposed the regulation. The negative attitude of industry was documented by one notable Malaysian environmentalist, Gurmit Singh (1986, cited in Nor, 1991 p.137) who lamented the attitude of the Federation of Malaysian Manufacturers (FMM), As he put it:

> The position taken by the FMM on the proposed EIA [regulations] is somewhat a repeat of that assumed by the oil palm industry when the Oil Palm Regulations were first announced… we are still hearing protests that EIA is unnecessary, [as] it will drive off investors, ruin the nation's industrialization plans, [and] create unnecessary delays.

It is believed that the MPOI's attitude does not differ much from its other industry counterparts. Such an attitude from developers came as no surprise, as in 1987 and 1988

the Malaysian economy was in recession, and many of the companies were in a difficult situation as business was badly affected by the downturn. Moreover, EIA was costly to implement at around RM100,000 to RM 300,000 for a project.

Although the existence of various legislations under its jurisdiction empowered the DOE to put pressure on the industry, it was revealed that in Malaysia the existence of legislation at that time did not necessarily imply implementation and enforcement of such laws. A local ecologist, Kiew (1988 p.5-9) argued that although Malaysia already had adequate legislation for the conservation of nature and natural resources.What was urgently needed according to him was the political will to protect the country's natural heritage and resources as well as the quality of the environment.

A lack of political will pertaining to the environment in Malaysia was clearly mirrored in the Government's statement, in its Fifth Plan (for the period 1986 to 1990), that the Malaysian environmental standard would be different from its Western counterparts. In other words Malaysia had its 'own standard' to deal with development and the environment. According to the report environmental standards will be made consistent with the: 'development goals of the country rather than the high environmental quality standards of the industrialized countries' (Malaysia, 1986 p.298). Reading between the lines of this statement it would appear that a rapid industrialization and development would be pursued as usual and the environment would not be given due recognition.

In a further development, during the early independence period (1957 to 1990) there was the establishment of increasing numbers of ENGOs in the country. The Consumers' Association of Penang (CAP) was established by the late 1960s, followed by the establishment of Environment Protection Society of Malaysia (EPSM) and Sahabat Alam Malaysia (SAM) in the 1970s. An international ENGO, the World Wide Fund for Nature (WWF) was also established in the country in the 1970s. These organisations were established by urban and western educated classes in the West Coast of Peninsula, mainly in Penang.[26]

[26]These ENGOs (CAP, EPSM and SAM) were established in Penang, rather than the federal capital, Kuala Lumpur because Penang in those days was regarded as the intellectual centre for English-educated Malaysians.

These ENGOs coupled with MNS (established in the 1940s) were among pioneers of Malaysian environmental non government organisations (MENGOs). Among their activities were: releasing press statements on environmental issues, mobilising public opposition against deforestation, and providing legal services to those seeking to protect the environment, to name but a few. Although they did not put pressure directly on the MPOI, they played an important role to raise concern and awareness of the government and public at large on environmental and social impacts of the costs of unsustainable development. These MENGOs in the early 1970s were instrumental in establishing the DOE when they lobbied the Malaysian government for the establishment of such an agency to deal with the environmental issues. They also called on the government to pay more attention toward environment management in its development policy.

As far as the MPOI was concerned there was no direct opposition to the expansion of industry from MENGOs. However, these groups did voice some concerns over deforestation, depletion of flora and fauna, soil erosion, water and air pollution exacerbated by the MPOI. Their approaches were more towards educating industries to take environmental issues into consideration in their activities. These ENGOs realised the importance of the industry to the Malaysian economy, and the number of people who directly depended on the industry. By and large, the existence of ENGOs had little effects on the MPOI.

4.5 Summary

This chapter has looked at the growth of the MPOI and its impact on the environment. Discussion of these themes was divided into two different periods: the colonial period before 1957, and the early period of independence (1957-1990). The roles of various stakeholders, especially regulatory stakeholders in pressuring the industry to be more environmentally responsible were also highlighted in the discussion.

This chapter showed that, during the colonial period, the MPOI experienced a slower growth as it was overshadowed by the rubber plantations. The total area of oil palm plantations was small in proportion to rubber. All plantations at this time were owned by European companies. The oil palms were introduced in order to reduce dependence of rubber that experienced a decline in price during the period. As the size of oil palm

plantations was relatively small and minimal environmental impacts were observed. environmental legislations were rather piecemeal and issues based.

Shortly after the country gained independence, the MPOI was aggressively promoted by the government, as a means to eradicate endemic poverty among citizens. As a result, oil palm plantations increased dramatically. But nevertheless, there were environmental costs related to the growth of the industry. In the late 1970s and early 1980s the industry was the largest source of water pollution. As a result the government established the DOE and promulgated special environmental regulations to control POME. This chapter showed that the MPOI was reactive to the DOE's demand to reduce their effluents. Due to coercive power of the department, the industry complied with the regulations and established treatment systems, which significantly improved its environmental record.

Apart from water pollution, deforestation was serious problem associated with the industry. A large area of rainforests was cleared to make way for palm oil plantations.. Unlike water pollution, deforestation issues received less attention from the authorities as well as the MPOI. The problem is this issue was largely beyond the purview of the DOE as, in Malaysia, matters related to lands and forests are under the authority of the states. Although in Malaysia any plantation of more than 500 hectares requires approval from the DOE, through an EIA report, oftentimes the land clearing to establish the oil palm plantations began as soon as companies got approval form the state authorities. This was further complicated when both the states and the federal government had a vested interest in the industry. This period, especially in the early 1970s, witnessed the birth of ENGOs in Malaysia. Though ENGOs, the media and the public raised their concerns on the environmental issues in the country, they hardly had any impact on the industry's environmental practices. Further development of the industry ensued in the 1990s and this is dealt with in the next chapter.

Chapter Five

The Contemporary Malaysian Palm Oil Industry and the Environment Since 1990

5.1 Introduction

Chapter One introduced the scope of this research project and Chapters Two and Three reviewed the literature in the field and developed a conceptual base for further search. Chapter Four discussed the development of the MPOI and the environment during the colonial period and the early period of independence. The aim of this chapter is to discuss the contemporary MPOI and the environment since 1990. The first section of this chapter looks at the growth of the industry during the period, its impact on the environment as well as stakeholders' pressures on the industry to be environmentally conscious. In the second section, Michael Porter's 5 forces model (Porter, 1980) is used to analyse the competitiveness of the MPOI, and this is followed by suggestions of suitable strategies for use in the industry in order to gain competitive advantages, as well as to be more environmentally responsible in the near future.

5.2 The growth of the MPOI

The decade after 1990 witnessed various new developments in the industry. First, unlike in the previous decades, FELDA had reduced its oil palm expansion, since suitable lands for the crop was scarce and poverty among Malays was no longer endemic. Second, private plantation companies who had been denied land for further expansion in previous period (the1960s to 1980s) started to aggressively open up their plantations in East Malaysia, and to a small extent in Indonesia.

Table 5.1 shows the distribution of oil palm area by sectors in Malaysia in 1990, 2000 and 2003. Overall, Malaysia experienced moderate growth in oil palm planted area, increasing from around 2.0 million hectares to 3.4 million hectares from 1990 to 2000; while by 2003 the total area planted with oil palms had increased to more than 3.8 million hectares.

Table 5.1: ***Distribution of Oil Palm Area by Sector in Malaysia (1990-2003)***

	1990		2000		2003	
	Hectares	%	Hectares	%	Hectares	%
Private Estates	912,131	44.9	2,024,286	60	2,248,014	59.1
Government Schemes						
FELDA	608,100	30.0	598,190	17.7	630,330	16.58
FELCRA	118,512	5.8	154,357	4.6	155,937	4.10
RISDA	32,582	1.6	37,011	1.1	59,497	1.56
State schemes	174,456	8.6	242,002	7.1	320,265	8.42
Smallholders	183,683	9.1	320,818	9.5	387,998	10.20
Total	2,029,464	100	3,376,664	100	3,802,040	100

Source: The Malaysian Palm Oil Board (MPOB) (http:// www.mpob.gov.my)

Analysis by sector shows that the FELDA sector experienced a reduction in its percentage of the total planted area.[27] In 1990 its area covered 30 percent, but by 2003 this had reduced to 16.6 percent. This reduction was due to a number of factors. One of these related to FELDA's policy change in the late 1990s to cease settling people, once the landlessness and endemic poverty in rural area were no longer a major problem (Jayasankaran, 2001 p.26). Moreover, in the upstream sector of the industry FELDA had shifted its organisation's strategy in the late 1980s to focus more on the development of management of its plantations on a commercial basis. Concurrently FELDA had also diversified its activities in the downstream sector, to include refinery activity and oleo chemicals production. Lastly, settlers who gained land titles sold their plantations for profits, where oil palm plantations were converted to housing estates and industrial areas (Simeh & Ahmad, 2001 p.11).

On the other hand, private plantations increased their oil palm planted area against other sectors, from more than 0.9 million hectares (44.9 percent) of the country's total planted area in 1990, to more than 2 million hectares (close to 60 percent) in 2003. The growth of private plantations during this period was largely attributed to the establishment of new plantations, especially by private plantation companies in Sabah and Sarawak, as land in Peninsula has become too scarce or too expensive, or both (Jomo, Phang & Khoo, 2004 p.27). In Sarawak, the total oil palm area of private plantations grew eleven-fold, from a miniscule 20,000 hectares in 1990 to a total of almost 232,000 hectares in 2000, accounting for half (55 percent) of the total area of oil palm

[27] Up to 1990 FELDA had developed almost a million hectares of agricultural land (Voon & Bahrin, 1992 p.359).

plantations in the state (*Yearbook of Statistics, Sarawak*, cited in Jomo *et al*., 2004 p.164). A further increase to almost half million hectares in 2003; thus recording an eleven-fold increment in just thirteen years in Sarawak.

Similarly, in Sabah, almost 79 percent of the total oil palm area was under private plantations in 2000. The private plantation companies invested in Sabah because the state provides attractive lands for lease up to 99 years for plantation activities.[28] In addition, private sector involvement in plantations in that state was facilitated by incentives introduced by the state government aimed at reducing export duties, allowing greater foreign equity participation, providing re-investment of tax allowances, and adopting a broader definition to qualify for capital expenditure deductions (Jomo *et al*., 2004 p.119). As Table 5.2 shows, Sabah experienced an exponential growth in oil palm area from 0.276 million hectares (20.4 percent) of total area in Malaysia in 1990 to more than 1 million hectares (almost 30 percent) of total area in 2000. Up until this point, Sabah is the largest state in terms of oil palm plantations in Malaysia. In 2004, Sabah had an 'overall acreage of 1.12 million hectares with a capacity to churn out 4.77 million tonnes of crude palm oil, or 35 percent of the national output' (*Daily Express News*, 29 November 2005). As a result of the expansion of oil palm plantation, Sabah and Sarawak account for more than 40 percent of the oil palm total area in Malaysia.

By the end of 1990s, due to the scarcity of land and escalating labour costs, private plantation companies in Malaysia gradually started to extend their operations to include overseas location, especially to Indonesia. By 1996, a year before the Asian financial crisis, 45 Malaysian companies, along with their Indonesian partners, had been able to secure land banks totalling some 1.3 million hectares (Othman, 2003 p.245). Guthrie Group was the largest Malaysian company in the country with investments through acquisition and joint ventures with Indonesian counterparts. In March 2001, it acquired an interest in 25 oil palm operations from Holdiko Palm Plantations (now known as Minamas Plantation), with estates located in Sumatra, Kalimantan and Sulawesi. In Indonesia the Group's land bank measures 215,047 hectares (Guthrie Group, 2006).

[28] In Sabah, land was set aside for agricultural use for 99 years by any ethnic group or nationality. Rent and optional premium payable depended on the value of timber and the quality of land. Commitment to cultivate within six months, the minimum proportion being brought into cultivation depending on size of the lease: within 3 years for less 40 hectares, within 5 for 40-250 hectares and determined by Minister for more than 250 hectares (McMorrow & Talip, 2001 p.222).

Table 5.2*: Distribution of Oil Palm Area by States ('000 hectares)*

State	1990 Hectares	1990 %	2000 Hectares	2000 %	2003 Hectares	2003 %
Johor	532.9	23.1	634.7	18.8	659.6	17.4
Kedah	29.3	1.5	57.4	1.7	68.6	1.8
Kelantan	60.5	2.8	72.1	2.1	80.3	2.1
Melaka	26.9	1.4	43.9	1.3	48.4	1.3
Negeri Sembilan	86.5	4.1	123.3	3.7	134.5	3.5
Pahang	439.7	19.6	514.7	15.3	583.3	15.3
Pulau Pinang	14.1	0.6	14.7	0.4	14.3	0.4
Perak	236.4	10.5	303.5	9.0	320.8	8.4
Selangor	149.5	5.8	135.5	4.0	134	3.5
Terengganu	122.8	5.5	145.8	4.3	158.3	4.2
Peninsular Malaysia	1698.5	74.9	2045.5	60.6	2202.2	57.9
Sabah	276.1	20.4	1000.8	29.6	1135.1	29.9
Sarawak	54.8	4.7	330.4	9.8	464.8	12.2
East Malaysia	331.0	25.1	1331.1	39.4	1560.0	42.1
Total	2,029.5	100	3,376.5	100	3,802.0	100

Source: The Malaysia Palm Oil Board (MPOB) (http: //www.mpob.gov.my)

5.3 The Environmental Impacts

As far as the MPOI industry was concerned, many of the environmental problems Malaysia faced in the 1990s and the early 2000s were the very same ones that the country had been struggling with since the early 1970s - air and water pollution, deforestation through massive land clearing and dirty rivers remained the issues that still made headlines in the media. The onslaught of the development of the MPOI on the environment ensued in the 1990s and early 2000s. From observation of the growth of the MPOI during this period (1990s and after), and in previous periods (before and during early independence) it is clear that the growth of the MPOI has been at the expense of Malaysian rainforests. In the early independence period large areas of virgin forests in the Peninsula vanished to give way to oil palm plantations, especially under FELDA schemes. As a result, the proportion of the total land area under forest in the Peninsula declined dramatically from 74 percent in 1958 to about 40 percent in 1990, recording a drop of 34 percent in 32 years (Aiken & Leigh, 1992 p.xvi). This was more than in all the previous 133 years - from 1824 to 1597 - under British colonization.

When suitable land was no longer available in Peninsular Malaysia, palm oil companies moved to Sabah and Sarawak and repeated the cycle of forest destruction. In Sarawak, it

was estimated that the recent acceleration of plantation agriculture, especially oil palms, and land development has resulted the loss of around 5 to 10 percent of forests (Jomo *et al*., 2004 p.178). In Sabah, deforestation - mainly as a result of oil palm plantations - was equally bad. Natural forest area fell from 68 percent in 1981 to about 60 percent by 2000 (McMorrow & Talip, 2001 p.222). When almost all suitable lands were already converted to oil palms, plantation companies moved to sensitive areas like upland and wetlands to use as plantation grounds.

All in all, according to the Malaysian Palm Oil Association (MPOA), 34 percent, or 1.21 million hectares of palm oil plantations in Malaysia involve forest conversion (FoE, 2004b p.15). However, others had argued a higher figure; from 1995 to 2000, based upon the government statistics, Simeh and Ahmad (2001) state that 86 percent of all deforestation in Malaysia was attributable to palm oil development alone.

It is clear that the increased yield of palm oil in Malaysia has been largely attributed to the increased of area of oil palms rather than to efficiency. Notwithstanding the improvement of agricultural practices, it has been recorded that the average efficiency in terms of yield per hectare in Malaysia remained stagnant over the last 20 years (Henson, 2003). According to Henson (2003 p.25) two factors contributed to this situation. First, the expansion in planting has included areas with lower yield potential due to poorer soils and climate. Second, there was poorer infrastructure and poor management in the newer plantations. The lesson to be learned from these findings is that the best possible option to increase the country's oil palm output is through increased yield, by utilising advances in planting materials and practices rather than expanding oil palm plantations onto more unsuitable lands.

The conversion of forests into oil palm plantations has a far-reaching impact on the environment, especially in sensitive ecosystems. In Peninsular Malaysia, in some cases this has led to the complete loss of some species of mammals, reptiles and birds, while encouraging proliferation of others to the extent that they become pests. In Sabah, the encroachment of oil palm plantations on the wetland area of the lower Kinabatangan River is very dangerous as its ecosystem is fragile to disturbance. Clearance of wetland to give way to oil palms resulted in severe flooding as well as human and wildlife conflicts (Teoh, Ng, Prudente, Pang, & Yee, 2001). Although it could not be denied that

flooding is a natural occurrence of the river, the frequency, intensity and impact of floods are amplified by such the activity. In early 2000, around 10,000 hectares of oil palm plantations were inundated for 22 days, resulting in financial losses to the plantation companies and the state (FoE, 2004c p.24). Both in Sabah and Sarawak, the expansion of plantations infringes on the habitats of many endangered species such as the Orang Utans, elephants and proboscis monkeys.

The unprecedented growth of the industry in Sabah has also been associated with river pollution, especially of the Kinabatangan River. The 20 palm oil mills in the Kinabatangan floodplain produce an estimated 1.08 million tonnes of effluent annually, and many do not meet the standards set by the DOE. Although all mills have waste stabilisation ponds, many of them were poorly maintained or too small to be effective. Furthermore, some of the waste stabilisation ponds were also inundated during flooding, causing concentrated effluent to be washed into the river (WWF, 2004a).

A further significant impact of the expansion of the MPOI after the late 1990s was regional air pollution. The expansion of Malaysian palm oil companies into Indonesia was partly responsible for the infamous South East Asia smoke crisis at the end of 1997, which was caused by ongoing fires as a result of open burning practices to clear huge areas of land for oil palm plantations. During that period South East Asian countries were blanketed with smoke and visibility was so limited - at its peak the air pollution index registered 800, indicating dangerous air quality - that it was considered as one of the world's great environmental disasters (Simons, 1998 p.102). An estimated 20 million people were treated in the 1997 fires for illnesses such as asthma, bronchitis, emphysema, and eye, skin and cardiovascular diseases; a passenger plane crashed in poor visibility over Sumatra, killing 234; and ships collided in the Strait of Malacca killing dozens. Pollution cost regional economies billions in aborted tourist plans, cancelled airline flights, lost workdays, medical bills and ruined crops (Simons, 1998 p.104). The culprits were mainly oil palm operators who used fires to clear land in Kalimantan and Sumatra, Indonesia. But, Indonesians were not the only ones setting the big plantation fires; it was also being carried out by Malaysian companies, who were involved in joint-venture partnerships in oil palm plantations in Indonesia.

Local communities that depend on the natural environment, suffer when their environment is affected by palm oil expansion. In Peninsular Malaysia, although complaints against palm oil companies among affected communities in the post 1990s period experienced a decline (compared with the earlier decades of the 1970s and 1980s), in a number of cases, indigenous people complained about pollution exacerbated by usage of chemicals in palm oil plantations. For example, in the early 2000s an *orang asli* (indigenous) community in Carey Island, Selangor claimed that their livelihood was being threatened by the poisons used in oil palm plantations near their settlement. They could no longer rely on fishing as the rivers were contaminated with chemicals (Tenaganita & PAN, 2002). These issues were more prevalent in Sarawak where the expansion of oil palm plantation not only damaged forests ecosystems, but also threatened the indigenous people in the state. In Sarawak, the environmental issues and social issues are inextricably intertwined. There were two situations where conflicts occurred pertaining to oil palm plantation activities. In the first situation, oil palm plantations of private companies encroached on the right of Native Customary Lands or NCLs[29] of indigenous people. This happened when the lands that plantation companies developed, from the leases granted by the state government, overlapped with NCLs. In another situation, conflicts occurred as a result of indigenous people's opposition to the oil palm plantation scheme under the *Konsep Baru* (which literally means as the New Concept) that was introduced in 1997 by the state government. The Sarawak Ministry of Land Development acknowledged that some 1.5 million hectares of land that was recognised as NCL would be converted to oil palm plantation (Ministry of Land Development, Sarawak, 1997). Confrontations occurred due to the encroachment of palm oil plantation on the NCLs. Working together with local ENGOs, indigenous people protested against the palm oil industry's unsustainable activities.

[29] In Sarawak the regulation of land matters had been prominent since the inception of Brooke rule. Land Orders VIII and IX of 1920 provided two categories of rural land: Country Lands and Native Holdings. Among the latter, 'Native Land Reserves' could be created in which 1.2 hectare blocks were available to all 'native born subjects', which included immigrant stock. (Hong, 1987 p.41). Later, in an attempt to separate the interests of Iban and migrants, further Land and Land Settlement Orders in 1931 and 1933 decreed a division into 'Native Areas', and Mixed Zones (for non-natives). Land within Native Reservations was not to be sub-divided, and no individual titles were to be issued, thus preventing mortgage, sale or any form of transfer other than inheritance (Chew, 1990 p.169).

It is not hard to understand why indigenous people fought against the palm oil industry. In Sarawak, prior to the introduction of oil palm, indigenous people had had a bitter experience due to logging activities. In 1987, Sarawak was in the international media spotlight when Penan, one tribe of indigenous people who were most severely affected by logging activity, launched a series of peaceful blockades to prevent the movement of heavy vehicles plying the road used by timber concessionaires (Weissman, 1994 p.9). At present the expansion of oil palm plantation by private plantation companies is a new threat on indigenous people and is considered even more pernicious than logging (Borneo Project, 1997 p.7). In logging activities, as soon as the timber was extracted, concessionaires left the areas and allowed secondary forests to generate; thus, after some time indigenous people could continue their activities. But, in the case of oil palm plantations, after forest lands were cleared and planted with oil palms, the companies could stay in the area for at least 60 years. With no more forests left indigenous cultures and livelihoods would be in jeopardy.

5.4 Environmental Stakeholders' Pressure

Despite the extensive use of EIA in Malaysia since it was legislated for in 1988, rainforests have continued to be severely degraded. The DOE's power in this matter is diluted, since EIA does not put enough pressure on the palm oil companies to be more environmentally responsible. This has raised some questions of the efficacy and benefits of EIA as a preventive measure to address environmental degradation. In the 1990s, some analysts reported a number of drawbacks of EIA in Malaysia (Bankoff & Elston, 1994 p.22; Nor, 1991). Firstly, although the concept was adopted from developed countries (as mentioned in an earlier section) the principal aim of an EIA is quite different in Malaysia. In Malaysia the purpose of an EIA is not to prevent a project from proceeding, but rather to force the incorporation of environmental considerations into the planning process. As a result, when developers submitted their EIA reports, there was no or little chance that their projects would be rejected. For example, from 1997 to April 1999, the Natural Resources and Environmental Board (NREB) approved 230 out of 252, (91 percent) applications it received (*New Straits Times*, 4 December 1999). In fact, in their EIA reports no alternative site and/ or changing of engineering design of the project would have been proposed by developers.

Secondly, even though developers needed to get permission from the DOE before they could begin their projects, oftentimes the projects started upon an approval from the state government. This was due to an ambiguity of the power of the DOE in relation to state approving authorities. According to the guidelines of EIA, state agencies can approve a project in principle before an EIA has been completed, but commencement should depend on the report's conclusion (Bankoff & Elston, 1994 p.22). As land, forests and natural resources (except for petroleum and natural liquid gas) in Malaysia come within the purview of state, from the developers' point of view the state government had greater authority, and an approval from a state was a licence to begin their projects and disregard the EIA requirements. The situation is made more complicated when the state governments have vested interests in the projects. For instance, in Sabah, in 2000 it was reported that in the RM 4.56 billion (US$1.2 billion) project - which was a Malaysian-Sino joint venture involving Yayasan Sabah (a State of Sabah Trust) covering an area 4 times as large as Singapore - the work of felling and clearing to establish oil palm plantations had started many years earlier although no EIA had been approved *(Blatant disregard for the EIA process,* 10/10/2000*)*.

Thirdly, the inability of the DOE to force developers to comply with their mitigation measures included in their EIA reports, as the Act only requires any person carrying out a prescribed activity with the approval of the DG of DOE to provide a sufficient proof that the conditions attached to the reports are being complied with and that the proposed measures to be taken to prevent, to reduce or control the adverse environmental impacts are being incorporated into the design construction and operation of the prescribed activity. The Act made no mention of inspections from the DOE (Bankoff & Elston, 1994 p.22), and DOE officers visited most projects only once or twice a year (Sabaratnam, 2005a). This was further compounded as no requirements for the DOE and developers to conduct systematic environmental audit of the results of post-project implementation monitoring of environmental impacts of a project so the chances of not adhering to mitigation measure was extremely high. Hence most developers did not feel the urgency to implement the mitigation measures that had been proposed in the EIA.

Finally, EIA procedures in Malaysia do not often include public consultation. Oftentimes there is no awareness that a project is even under review, and public opinion is seldom sought in most cases despite the provision for such consultation in the legislation. The Handbook of EIA (DOE, 1988 cited in Nor, 1991 p.133) clearly states

that: 'The public is invited to comment on a proposed project which has been subject to Detailed Assessment…it is the responsibility of the project initiator to provide and distribute sufficient copies [of the Detailed Assessment]…[to] the interested public'. What made it difficult for the public to evaluate EIA reports submitted to the DOE was their confidentiality. The reports are classified documents and thus not accessible to the public. As a result, many controversial projects were approved and no valuable input came from the public early in the assessment process.

In other development, the level of environmental compliance with EQA 1977 (Prescribed Premises) (Palm Oil Mills) regarding palm oil mill effluent in this period is still around 80 percent, and some millers were still charged in courts for breaching the laws. Table 5.3 shows some environmental compliance rates and cases of action taken by the DOE in the 1990s and the early 2000s pertaining to POME.

In relation to air pollution, in 2002 a total of 1159 cases of open burning were detected; open burning which involved plantations was the second highest cause reported in the country after open burning in bushes (445 cases). The DOE recorded 300 cases of open burning incidents in plantations (DOE, 2002). Because the use of fire has the cheapest cost for land clearing and replanting some irresponsible plantation companies, or contractors who they hired to do the job, would exercise this method to minimise costs. In 2003, 243 cases of open burning involving plantations made it the largest source of open burning in the country. The highest number of cases was in Sabah (112) and Sarawak (87) (DOE, 2003a). According to the 2003 Annual report of DOE, Compliance Status of palm oil mills of the Environmental Quality (Clean Act) Regulations, 1978, was 73 percent, making it among the lowest industry for compliance, together with rice mills and the cement industry with percentages of compliance of 72 percent and 64 percent respectively. According to the DOE, 2003, the main reason for the low compliance level of this sector was inefficient control mechanisms (DOE, 2003a p.94).

Table 5.3: ***Compliance Rate and Action taken by the Department of Environment***

Year	Environmental Cases/ Effluent
1991	The Department of Environment (DOE) found an 80% compliance with the regulations, and four mills had their licences suspended (DOE, 1991 p.38)
1992	The DOE closed 2 palm oil refineries in Kuala Langat, Selangor for excessive levels of effluent discharge despite the concerted opposition of smallholders and the ambivalent attitude of the Selangor Government (Salam, 1992)
1996	Compliance rate for emission and effluent discharge standards by palm oil mills was 78.3% (Tan, 1999)
1997	Overall compliant rate of emission and effluent discharge standards of oil palm mills was 76%. The DOE suspended 2 the licences of two palm oil mills, 27 oil operators were charged in courts (Tan, 1999)
1998	Overall compliance rate of palm oil mills was 81% (DOE, 1998)
2002	471 enforcement visits to palm oil mills were conducted by DOE officers in the states. Among the actions taken resulting from these enforcement visits were: 233 notices, 6 directives, 35 compound notices, 7 faced prosecution for various offences under the regulation (DOE, 2002 p.80).
2003	699 inspection on palm oil mills were conducted by the DOE, among action taken: 245 directives, 25 notices and 42 compounds (DOE, 2003a)
2004	2 palm oil mills were charged under EQA, 1974 in Sabah for polluting Sungai Segaliud Basin in Sekong, and other 3 were under close watch by the DOE (*Daily Express News*, 12 August 2004)
2005	3 palm oil mills were each fined RM20,000 or two months' jail by the Sessions Court for disposing effluence exceeding the permitted level. They had violated Rule 12 of the Environment Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977. The charge is under Section 23(1) of the Environmental Quality Act which carries a maximum fine of RM100,000 or five years' jail, or both on conviction (*Daily Express News,,* 12 May 2005)

Typically, the Malaysian government expressed its concerns towards environmental impacts due to the MPOI activities through various statements reported in local newspapers. The Science, Technology and Environment Minister, Law Hieng Ding when releasing the DOE Annual Report 1997 had said that he was dissatisfied with the compliance rates among palm oil mills (Tan, 1999). According to him there was no excuse for the industry's failure to comply with the discharge standards, as the price of crude palm oil was good and the industry could afford to invest in pollution abatement systems and methods. Recently, the Sabah State Cabinet has given the Tourism, Culture and Environment Minister the green light to discuss with the Federal Government a proposal to ban palm oil mills from discharging effluent into rivers (*Daily Express News*, 19 January 2006).

The same tone was also expressed earlier by the DG of DOE, Rosnani Ibrahim: 'they are supposed to be the forerunners in terms of meeting environmental standards. They have the resources and technology. All the mills and factories have treatment plants and yet compliance rate (for the palm oil sector) has declined' (Tan, 1999). But statements from the ministers and DG of DOE alone cannot put pressure on the industry unless this is supported by political will on the government's side. A lack of proper enforcement and strict legislation to punish the culprits on part of the DOE, so as to set a lesson to others not to follow suit, hampers the government aim for full compliance. As was mentioned earlier, most palm oil mills depend heavily on the ponding system for POME treatment and poor maintenance of the treatment systems resulted in higher BOD levels than the required standard released into rivers. Although all mills have waste stabilisation ponds, many of these ponds are poorly maintained or too small to be effective. Some of the waste stabilisation ponds are also inundated during flooding, causing concentrated effluent to be washed into the rivers. Enforcement by regulatory agencies is still inadequate at present (WWF, 2004a).

The MPOI was slow to respond to more reliable POME treatment technologies although such technologies have been available since the 1980s. For instance, in the 1990s, as a result of R&D conducted by PORIM, clean technology (zero-waste technology) was made available for the treatment of POME using a novel evaporation technology (Ngan, 2000 p.1450). This technology was first developed in a laboratory and then a pilot plant that was installed in a palm oil mill was developed. According to Ngan (2000 p.1450), by using this technology untreated POME is evaporated to produce solid POME (20-30 percent) and about 85 percent of water. The solids concentrate is rich in plant nutrients, especially nitrogen, phosphorus and potassium - good raw materials for making fertilizer. In addition, the solids concentrate also contains about 13.5 percent amino acids - potentially be used for making animal feed.. Additionally, the evaporated water can be recycled and supplied to the boiler. For example, based on 85 percent water recovery rate, a 30 tonne FFB per hour mill, which generates about 19.5 tonnes of POME, will result in 16 tonnes of water being recovered for recycling. This is sufficient to supply all the boiler feedwater required for the mill operation. This zero-waste technology is suitable for new palm oil mills, but for existing palm oil mills, which already have their treatment plants, to change to this new technology is costly, as they have previously invested in POME treatment.

The problem with the DOE has long been recognised as lack of enforcement (Emmanuel & Cruez, 2005); its activities have been restricted by a shortage of funding and personnel to monitor effluent and emission standards. Moreover, penalties imposed are inadequate to deter polluters (Bankoff & Elston, 1994 p. 27). The DG of DOE has identified that lack of enforcement is primarily associated with a lack of staff, consistent with the view of the Deputy Minister of Natural Resources and Environment, S. Sothinathan, who admitted that there were only 1,000 enforcement officers to monitor 70,000 commercial facilities (Emmanuel & Cruez, 2005). This means one officer per 70 facilities -a manpower shortage that had persisted for the last 10 years, although the number of DOE staff increased two-fold from 500 in 2000 (Martin, 2000). As at 31 December 2003, the total number of personnel at the DOE was 975, comprising two officers in the upper management group, 172 in management and professional group, and 801 in supporting group (DOE, 2003a). As at 11 August 2005, the Department's staffing had increased to 1568 staff (on full operation), extending its operation through 15 states offices and 26 branch offices (DOE, 2005). According to the Natural Resources and Environment (NRE) Deputy Minister, S. Sothinathan, by March 2006 the DOE should have a total of 1,900 enforcement officers on the ground in the fight against the environmental problems in the country (Cruez, 2006). In early 2006, the Federal Government announced plans for the imminent recruitment of more DOE staff to undertake enforcement and other functions.

Although effective enforcement required sufficient personnel, enforcers lacked right mentality to carry out job is also another problem in Malaysia. According to DOE's DG, Rosnani Ibarahim, 'enforcement is not easy, it's tough. There are many regulations, and most concern technical things. So do people doing the enforcement have to be equipped technically as well? They have to be knowledgeable in the subject matter to be good enforcers' (*New Straits Times*, 31 March 2005*)*.

Not only has a lack of resources for enforcement been responsible for companies violating EQA 1974, the punishment of the culprits is not severe enough to prevent them from repeating the same offence or others from not following suit. To this point the courts were only imposing a fine of RM100,000 which is very affordable to companies, when the maximum possible fine is RM500,000 (Cruez, 2006). Recently, the ministry proposed a mandatory jail sentence for the management personnel of

companies which are behind environmental violations in the country. In Malaysia, although according to the law violation of EQA 1977 makes the offender liable for up to a RM500,000 fine or a 5 years jail term, the courts have never imposed a custodial sentence even one day. In another development, to show the government commitment to the environment, the Prime Minister, in the 2006 budget, stated that a sum of RM 1.9 billion would be allocated for implementation of environmental preservation projects in the country. The sum comes as a big jump from the 2005 allocation RM 149 million for the operating and development expenditure of environmental programmes (*New Straits Times,* 1 October 2005).

Overall, environmental regulations for the MPOI have undergone rapid changes over the past three decades. In addition to the existing regulations, which were imposed on the MPOI in previous decades (The Soil Erosion Act, 1960, The Pesticides Act, 1974, The Environmental Quality Act, 1974 and the Environmental Impact Assessment 1988), in the 1990s and the early 2000s the government has imposed new regulatory measures pertaining to environmental management. Open burning was banned in oil palm plantations in 1998 as a result of the Asian smoke crisis in 1997. The latest regulation was in 2002, when a blanket ban on usage of paraquat (a herbicide) in plantations was legislated by the government (Sabaratnam, 2005b). With these new regulations, coupled with existing ones, the government intended to impose more pressure on the industry to be more environmentally responsible in its activities. However, the effectiveness of these regulations, in dealing with environmental crises, is questionable as they were not followed by strict enforcements. Obviously, the DOE, since its establishment in 1975, has grappled with lack of resources, both in terms of manpower and expertise in dealing with increasing environmental problems. Actually, the problems with the DOE lie with the Malaysian government's uncommitted response to environmental degradation. For the Malaysian government, as well as for governments in other developing countries, economic growth is the overriding important goal (Aiken & Leigh, 1992 p.121).

Local communities have also exerted pressure on the MPOI to be more environmentally and socially responsible, this case being more prevalent in East Malaysia. Various means have been utilised by effected communities to put pressure on palm oil companies, ranging from negotiation to confrontation. More often than not, in the case of indigenous people against oil palm companies in Sarawak, the former resorted to

non-violent demonstrations, such as blockades, to prevent the plantation companies from carrying out clearing activities. Such a conflict could turn to disaster however; and even become fatal in some cases. For example, on 1st September 1999, when a violent clash occurred between Iban natives from two longhouse communities in the Miri Division and workers of a contractor to a oil palm plantation company, it resulted in four workers being killed and three others being injured (BRIMAS, 1999).

Besides blockades, indigenous people, with the assistance of MENGOs, also filed a court case against plantation companies and the state government of Sarawak defending their NCLs. By 2001 over 20 cases involving NCLs had been brought to the Sarawak Court (Thompson, 2001). Recently, in Sabah, (January 2004) 100 representatives from 30 tribes stood before Sabah's Deputy Chief Minister of Land and made a plea for the government to abide by its own laws, to recognize native rights to protect and manage their natural resources, and reverse the reallocation of lands to logging and plantation corporations. However, their attempt was unsuccessful, they had filed a court case against the State and two plantation companies (Borneo Project, 2004 p.21).

The pressure on the MPOI to be more environmentally and socially responsible in this decade also comes from MENGOs. In Peninsular Malaysia MENGOs do not directly pose a significant threat to the industry. This is because the industry already experienced a lower growth in oil palm planted areas. Furthermore, water pollution due to POME, which had been a major cause of concern in the 1970s, was reduced significantly after the promulgation of Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations in 1977. Nonetheless, one major concern pertaining to the industry was its continued usage of chemicals in plantations. In 2002, Tenaganita (an organisation concerned with marginalised workers) and the Pesticide Action Network (PAN) published their report of the plight of women labourers who sprayed pesticides in oil palm estates in Malaysia entitles *Poisoned and silenced: a study of pesticide poisoning in the plantations*. They found women sprayers in Malaysia were being poisoned by the pesticides they sprayed daily and the organisations proposed a total ban of dangerous pesticides – especially paraquat. In the same year as publication of the report, the government of Malaysia imposed a blanket ban on usage of paraquat in plantations, except for areas with two years old palms (Sabaratnam, 2005b). Such a case shows that

ENGOs - through the government - exerted indirect pressure on the industry to behave in an environmentally responsible way.

Unlike the situation in Peninsular Malaysia, in Sarawak and Sabah conflicts between palm oil companies and indigenous people were getting more attention from MENGOs. In Sarawak, MENGOs such as Borneo Resources Institute (BRIMAS) and Sahabat Alam Malaysia (SAM) stood together with affected indigenous people; they were more vocal and resorted to confrontational approaches to deal with the MPOI when their demands were not entertained by the state government and palm oil companies. To empower indigenous communities MENGOs' activists travelled from village to village to give talks to indigenous people on environmental impacts of unsustainable oil palm practices, and at the same time to tell them their rights over the disputed lands and to let them know what they were supposed to do to claim their rights. In some cases MENGOs assisted local communities to produce their own maps of disputed lands through a combination of local people's knowledge of their customary areas and modern technology such as Global Positioning Systems (GPS) and Geographic Information Systems (GIS) (Cooke, 2003 p.281). In this respect, MENGOs used their expertise to enhance power and knowledge of local people against palm oil companies' encroachment into their native customary lands.

Not all MENGOs resorted to confrontational approaches to dealing with palm oil companies. For instance, WWF of Malaysia believed in cooperation. The organisation, since 1998, has been involved in a joint-venture project with the Sabah Wildlife Department and plantation companies in the Lower Kinabatangan River to establish the Kinabatangan Corridor to reduce environmental impacts of oil palms plantation in the sensitive area by means of reforestation and tree-plantation to establish riparian areas along the river (WWF, 2003). The driving factor for palm oil companies to cooperate with WWF in this case is probably due to some benefits; these included improved revenue, reduced costs from unproductive land, enhanced public image and possible expansion into the market for green products.

In the above-mentioned cases, even though local ENGOs did not have any legal power against the palm oil companies, they could pose threats to the palm oil companies through their campaigns, as well as place pressure on the government. However, it is

interesting to note here that, unlike in developed countries, Malaysian ENGOs are relatively weak and in most cases the government prefers to side with the palm oil companies as the government is, in one way or the other, involved in the industry. The confrontational approach previously discussed is considered as the exception rather than the norm.Overall, MENGOs have relied upon patient, co-operative presentation of information, and tend to work with the government authorities. According to Muzaffar (2001 p.189-199) there are two reasons why MENGOs have been considered weak vis-à-vis their Western counterparts. First, in 1981 the Malaysian government pre-empted these organisations by introducing an amendment to the Society Act by which MENGOs need to register their organisations under the jurisdiction of the government. Another blow occurred in 1987, under the code-name of *Operasi lalang,* members of a number of MENGOs, including SAM activists who struggled for indigenous people of Sarawak against unsustainable logging and monoculture crops, were detained under the Internal Security Act (ISA).

An alternative way as to how MENGOs can exert pressure on the MPOI to be more environmentally responsible is through cooperation with international ENGOs. It is believed that the palm oil companies felt more threatened by international ENGOs which have a wider reach through their international campaigns, such as boycotting palm oil from Malaysia, calling on their governments to put pressure on the MPOI to comply with various environmental standards. Since the end of the 1990s, after the devastating South East Asia forest fire, where the whole South East Asia region was blanketed with smoke due to open burning, a score of international ENGOs have launched aggressive campaigns against unsustainable oil palm practices in the South East Asia. Although the culprits were mainly oil palm operators who used fires to clear land in Kalimantan and Sumatra in Indonesia, the Malaysian palm oil companies were not spared from criticisms as customers in developed countries do not necessarily differentiate. Both the MPOI and their Indonesia counterparts face strong criticisms from international ENGOs. The palm oil industry in South East Asia has been blamed for massive deforestation of tropical rainforest, endangering species such as *orang utans*, polluting water and air as well as engaging in conflict with indigenous people. For example, in 2004 Friends of the Earth (FoE) published the report entitled *Greasy palms: palm oil, the environment and big businesses* in which it highlighted negative consequences of the industry to the environment and social communities (FoE, 2004a).

Due to various external pressures, especially from the DOE and ENGOs, the MPOI has improved some of its environmental performance. The availability of new plantation technology which is environmentally friendly, and which is proven efficient and effective, has also contributed to the implementation of a number of environmentally responsible management practices. Environmental management practices which are widely practised in the upstream sector are: terracing, cover crops, integrated pest management, zero open burning replanting techniques, use of POME as fertilizer, natural decomposition of empty fruit bunches, and introducing barn owls in order to control rats.

Also, in the downstream sector every palm oil mill is equipped with POME treatment facilities. Over the last ten years, POME which contains substantial quantities of valuable plant nutrients has been used as a fertilizer substitute. The paradigm of management of palm oil mill wastes among palm oil millers has changed, from a treatment and disposal approach in the late 1970s and the early 1980s, to a beneficial utilization of asset approach since the mid 1980s. In the 1990s until today the land-application of POME has become a standard practice for those mills located within palm oil plantations. This has resulted in substantial savings in fertilizer costs, and increased income from higher FFB production (Ngan, 2000 p.1449).

Meanwhile, there are some other positive signs; some members of the industry are becoming more proactive. They not only exercise environmental management practices which are deemed necessary according to the regulations, and have a clear economic value in terms of efficiency, but they move one step further to embrace voluntary environmental practices. For example, environmental management is now being included into corporate strategy and considered as an important agenda at corporate level. A handful of companies, mainly big businesses, have environmental committees to look after their environmental performance. Some companies have started to exercise corporate transparency and accountability by taking the initiative to communicate their environmental practices to stakeholders through voluntary environmental reporting. Among common themes that have been disclosed by plantation companies are: the company's environmental policy, zero-burning practices, soil and water conservation, integrated pest management (IPM), utilisation of waste and biomass, certification of

ISO 14001 and EIA. Such voluntary environmental disclosures are practised to demonstrate a constructive response to environmental pressure on the industry.

A survey conducted by the Association of Chartered Accountants (ACCA, 2002 p.41) found that out of 41 plantation companies listed on KLSE, 7 companies, or 17 percent, had implemented environmental reporting. For instance, Golden Hope received an award as one of ACCA MESRA 2004 Winners in the category of the Best Environmental Reporting in Annual Report. Another palm oil company, Guthrie Group was recognised with a Special Mention by the judges for its environmental reporting (*New Straits Times*, 30 March 2005).

Another voluntary practice which is gaining popularity is the implementation of ISO 14000 series management standards among palm oil plantation companies. The increased number of palm oil plantation companies being certified with ISO 14000 shows that they are taking the issues more seriously. In addition, some industry members who had negative attitudes towards ENGOs in the past, have started accommodating ENGOs. Cooperation with ENGOs pertaining to environmental management is now practised within the MPOI. Some companies had participated in the Roundtable on Sustainable Palm Oil (RSPO) – an international initiative - to discuss with NGOs and other involved parties, the future of existing sustainable agricultural practice and oil palm initiatives for sustainable development in the industry. It is clear that over time, with mounting pressures from various stakeholders added to the availability of new technology in the industry, the MPOI is becoming more environmentally responsible in their activities.

5.5 Porter's 5 Forces Approach

In order to determine the competitiveness of the MPOI and in turn develop a better strategy for the industry, Porter's 5 forces approach is used. According to Porter (1980) the state of an industry's competitiveness depends on five basic competitive forces: (i) intensity of rivalry among existing competitors; (ii) threat of new entrants; (iii) threat of substitute products; (iv) bargaining power of buyers; and v) bargaining power of suppliers (Porter, 1980 p.3). The collective strength of these forces will determine the ultimate profit potential in the industry. The objective of this competitive strategy is to

find a better position for the industry, where the industry can best defend itself against these competitive forces.How each force influence the MOPI is discussed in turn.

5.5.1 Intensity of rivalry among existing competitors

The MPOI is not alone in the palm oil industry, and it faces threats from competitors such as Indonesia, Nigeria, Colombia, Cote D'Ivoire, Thailand, Ecuador and Papua New Guinea. Among these producers, Indonesia as the second largest producer of palm oil and is a major threat to the MPOI (Table 5.4).

Table 5.4: ***The World Major Producers of Palm Oil ('000 tonnes)***

	1995	%	2000	%	2004	%
Malaysia	7,811	51	10,800	49	15,369	47
Indonesia	4,480	29	6,900	32	12,426	38
Nigeria	660	4	740	3	981	3
Colombia	387	3	516	2	654	2
Cote d'Ivoire	285	2	290	1	327	1
Thailand	354	2	510	2	654	2
Ecuador	180	1	215	1	327	1
Papua New Guinea	223	2	281	1	327	1
Others	1,097	7	1,699	8	1,635	5
Total	10,867	100	21,877	100	32,700	100

Source: Malaysian Palm Oil Board (MPOB), http://www.mpob.gov.my, Accessed on 22 May 2005.

In 1995 Malaysia and Indonesia produced 7.8 million and 4.5 million tonnes of palm oil respectively, with the percentage of Malaysia's production against total production being 51 percent, and Indonesian's share 29 percent. In 2000 Malaysia and Indonesia expanded their production to 10.8 million and 6.9 million tonnes respectively. However, the percentage of Malaysia production against total production of oil slightly reduced to 49.4 percent, while Indonesia increased its percentage to 32 percent. In 2004, Malaysia produced 15.4 million tonnes of palm oil, its share dropped to 47 percent. In contrast, Indonesia increased its share to 38 percent with 12.4 million tonnes palm oil. The increased market share of Indonesian's palm oil over time has significantly eroded the percentage of the Malaysian market share.

Palm oil is a commodity in which the choice of the buyer is largely based on price and service. As a result, there is an intense pressure on these countries to minimise operation costs and enhance services to their customers. Comparatively, Indonesia has an

advantage over Malaysia in production costs. In 1998 Indonesia's production costs ranged from US$135.5 to US$203.0 per tonne, far below Malaysia's production costs that ranged between US$206.5 to US$243.5 per tonne (Prasetyani & Miranti, 2004). The lower production cost in Indonesia is largely attributed to cheaper labour and land costs. The labour cost in Indonesia is 55-60 per cent cheaper than Malaysia (Prasetyani & Miranti, 2004). For example, a Malaysian plantation worker earns up to US$15 a day - five times that of the best paid Indonesian counterpart (Tripathi, 1998 p.42). A similar ratio is also true for land costs. Malaysian land, at US$4000 a hectare, costs four times more per hectare than the amount for land in undeveloped regions of Indonesia (Tripathi, 1998 p.42).

Further, Indonesia has the advantage in terms of the availability of land. Malaysia, is running out of plantation area for expansion. Almost all suitable land in both Peninsular Malaysia and Sabah are planted with oil palms. At present the only chance to increase the industy's plantation area will be in Sarawak, however, not all of the land allocated by the state government (around 1 million hectares) is suitable for oil palms. According to an analyst in Indonesia, in 2007 Malaysian and Indonesian palm oil production will compete closely, as Indonesian production will grow quickly to reach 14 million tonnes, the Malaysian production will remain relatively stable at around 15 million tonnes (Prasetyani & Miranti, 2004 p.6). According to Prasetyani and Miranti (2004 p.7) figures in the Oil and Fats magazine, 2002, predicted that in 2015 production of palm oil from Malaysia and Indonesia will be 14.1 million tonnes and 14.8 million tonnes respectively. The expected percentages for Malaysia and Indonesia against total production of palm oil are 40.2 percent and 42.2 percent respectively (Teoh, 2002 p.11).

Although Malaysia is at a disadvantage in terms of labour and land resources, it has advantages over Indonesia in technological knowledge, infrastructure, down stream industrial development, regulation, R&D, fiscal policy and marketing strategy, and the activity of palm oil associations throughout Malaysia. Due to high yield crops coupled with good agricultural practices, productivity in average per hectare of oil palm in Malaysia is higher than in its Indonesian counterparts. Malaysia's productivity is 3.6 million ton per hectare, whereas Indonesia is only 3.1 million tonnes per hectare (Prasetyani & Miranti, 2004). Due to higher productivity, in 2003 with total planted area of 3.8 million hectares Malaysia produced 13.4 million tonnes of palm oil,

compared to only 9.8 million tonnes produced by Indonesia on the same amount of land.

Moreover, Malaysia has a better infrastructure than Indonesia, in terms of mills, refineries and oleo chemical plants, as well as port facilities. Malaysia is more advanced in downstream industrial development. At present Malaysian exports consist primarily of processed palm oil, where in contrast, Indonesia exports more than 60 percent crude palm oil. Malaysia is also in an advanced stage in oleo chemicals activities, whereby palm oil is further processed to produce oleo chemicals that are used in production of the personal care, pharmaceutical and food processing industries. At present Malaysia is among the largest producers of oleo chemicals, accounting for 20 percent of total oleo chemicals in the world. In contrast, this value added industry is not yet well developed in Indonesia; consumption of CPO by the oleo chemical industry is relatively low (around 7 percent) compared to 20 percent in Malaysia. The favourable government fiscal policy also encourages downstream activity, as there is lower tax on processed palm oil. The MPOI success is also supported by regulatory measures taken by the relevant government agencies, for example, the Palm Oil Regulation and Licensing Authority (PORLA) which was established in 1974, has the responsibility to maintain a high quality standard of the industry, and among other things it is responsible for ensuring that planters or growers only buy oil palms from licensed seed producers and nurseries. In addition, PORLA also makes inspection of the quality of palm oil at Malaysian ports to make sure it is up to the required standard.

To enhance MPOI competitiveness, the government established the Palm Oil Research Institute of Malaysia (PORIM) in 1979. The institute is actively involved in R&D in various aspects of oil palm activities, ranging from finding better yield hybrids, improving oil extraction techniques, to researching usage of by-products. In 1999 both organisations were merged to achieve more efficiency and synergy. In terms of promotion, the Malaysian government, through the Ministry of Primary Industry and Commodities, actively seeks new markets and offers attractive packages to attract buyers; for example, counter-trade agreements and attractive credit terms on the purchasing of palm oil. Another advantage of the MPOI vis-à-vis its Indonesia counterpart is the strong relationship with its industry associations. Close cooperation with these associations is crucial in its success. They meet regularly and discuss various

issues arising in their businesses and find collective ways to address them. They act as a single voice for their members; oftentimes they discuss important issues with the government and lobby for support.

5.5.2 Threat of new entry

New entry refers to those who yet in the industry but will enter the industry as they see advantages and attractiveness of the industry. There are several barriers of entry to newcomers into an industry. The higher the barriers of entry to an industry, the more difficult for them to enter. Geography is considered as a barrier in this specific industry. Since oil palms only grow in equatorial regions, only host countries in Latin America, Equatorial Africa and South East Asia can be involved in the industry. New comers in this industry would therefore be expected to be limited to these countries. They may be local companies and/ or foreign companies who invest in these countries.

In addition, the palm oil industry is capital intensive, and it needs huge tracts of land for oil palm plantations to achieve economy of scale. Moreover, the location of palm oil mills needs to be near to the plantation as FFB need to be sent to the mill as soon as possible (within 24 hours), to avoid accumulation of FFA which will affect its oil quality. Other infrastructure such as a transportation system, utilities and ports are also necessary to support the industry. Due to cheap prices of land and low labour costs, it is believed that players from Africa and Latin American are likely to enter the industry. However, their threat to the MPOI will be relatively small as equatorial countries in Africa face civil wars, internal conflicts and poor infrastructure. In the case of Latin America, where oil palms are an alternative to soybeans, investors in these countries are more attracted to invest in the existing soybean industry rather than in oil palms. Since they do not have enough experience in the palm oil industry, it is unlikely that these companies will invest, as they need to acquire considerable technological and managerial expertise.

5.5.3 Substitute Products

Substitute products refer to any products that can replace palm oil. In this case, other types of oil and fats such as soybean, rapeseed, sunflower, groundnut and coconut are a

possibility. However, palm oil has a number of advantages over these vegetable oils. In terms of consumption, among the 17 oils and fats, palm oil consumption recorded the highest growth rate of 7.9 percent per year, compared to soy oil growth only 5.6 percent per year, during the past 40 years (1962-2002) (Basiron, Balu & Chandramohan, 2004 p.4). From the demand perspective, it is estimated that the demand will be higher for palm oil in the future, especially from developing countries. Apart from its competitive price, the reason for this high preference is that palm oil has many advantages compared to those of substitution products. For example, palm oil is relatively more long lasting in terms of storage, is resistant to high temperature and pressure, has a stable odour, is rich in vitamins, and is useful as a raw material for various industries.

From the producers' point of view, oil palms have two main advantages over the substitute crops. First, productivity per hectare of oil palms is much higher than that of any other major oil seeds, being 7 and 2.5 times more than soybean and rapeseed respectively (Ming & Chandramohan, 2002 p.11). Due to the high yielding trait, relatively oil palms utilise less area against other oil seeds, for the same production. For instance in 2001, countries worldwide utilised only an area of 7.0 million hectares of land to produce 23.6 million tonnes of palm oil, compared to soybean producers, required about ten-times the area of land (i.e. 75.8 million hectares) to produce only a slightly higher amount of 27.8 million tonnes of soybean oil (Table 5.5).

Table 5.5: ***World Planted Area (million hectares) and Oil Production (million tonnes) of Selected Vegetables Oils - years 2001***

	Area Planted (million hectares)	Oil Production (million tonnes)
Soybean	75.8	27.8
Rapeseed	24.8	13.7
Sunflower	19.5	8.2
Coconut	9.4	3.5
Palm Oil	7.0	23.6

Source: Ming, K. K. and Chandramohan, D. (2002) "Malaysian palm oil industry at crossroads and its future direction" *Oil Palm Industry Economic Journal*, 2(2), p. 12.

Second, palm oil production cost is cheaper due to lower usage of fertilizer and pesticides compared to other vegetable oils (Table 5.6). The Food and Agriculture Organization's (FAO) study showed that among major vegetable oil and fats producers, oil palms had the lowest requirement for nitrogenous fertilizer and phosphates while

soybean needed the highest inputs (FAO, 1966, cited in Teoh, 2004 p.24). For example, about 47 kg of nitrogen are required to produce 1 tonne palm oil while 315 kg would be necessary to obtain 1 tonne of soybean oil; thus the demand for nitrogen by soybean is 6.7 times higher than that of palm oil. Soybean requires about 10 times the amount of phosphates compared to oil palm. The same is also true for usage of pesticides, compared to other oilseed crops; oil palm had the lowest inputs for pesticides, as shown in the FAO's study in 1966 (Table 5.6). Application of crop protection chemicals was only 3 kg/ha compared to 28 and 29 kg/ha for sunflower and soybean respectively.

Table 5.6: ***Input analysis of Intensive Oilseeds and Oil Palm Cultivation (per tonne of oil)***

Items (unit)	Soybean oil	Sunflower oil	Rapeseed oil	Palm oil
		Inputs		
Nitrogen [N (kg)	315	96	99	47
Phosphates (P_2O_5 kg)	77	72	42	8
Pesticides/herbicides (kg)	29	28	11	2

Source: Teoh, C. H. (2004), "Selling the green oil advantage?", *Oil Palm Industry Economic Journal*, 4(1) p.22-31.

Due to its advantages, palm oil production is the fastest growing among other world oils and fats, having increased almost 5 times from 4.5 million tonnes in 1980 to almost 22 million tonnes in 2000 (www.mpob.gov.my, viewed on 20 June 2005). On the other hand, its largest competitor - soybean oil - only doubled its production in the same period. Other oils and fats showed little or no increase at all. Due to unprecedented growth, palm oil will replace soybean oil as the world largest source of oils and fats in the near future. From this analysis, it is clear that at present, and in the very near future, substitution of another product for palm oil is unlikely.

5.5.4 The bargaining power of suppliers

Suppliers refer to those who supply materials to any industry. According to Porter suppliers bargaining power is high when they are few in number, no substitute products are available, the industry is not an important customer of the supplier group, the suppliers' product is an important input to the buyer's business, the supplier group's products are differentiated and pose a credible threat of forward integration (Porter, 1980 p.27-28). With regard to the palm oil industry, suppliers are financial institutions,

engineering companies (material-machineries equipment like mills and refineries, oleo chemicals plants), chemical companies (fertilizers and pesticides), and labourers.

In the MPOI case, most big plantation companies are vertically integrated; they are involved in both upstream and downstream sectors of the industry. In the upstream sector, most of them use their own seedlings, and have their own nurseries. Some who are not involved in these activities will buy from independents suppliers. In the case of pesticides and fertilizers, at present the industry is the largest consumer of chemicals in Malaysia. Those companies can use volume of buying to gain bargaining power over their suppliers. As the MPOI is the largest plantation industry and the largest user of chemicals in Malaysia, suppliers must sell to the MPOI. At the same time, the industry is gaining experience in how to reduce usage of insecticides through IPM, and is increasing its inland application of POME and usage of EFB as fertilizers.

Other important suppliers are engineering companies. Large investments are made in purchasing fixed assets such as mills and refineries, and POME treatment plants. The bargaining power of the MPOI over these engineering companies is high, as there are few buyers available since the MPOI is dominated by a few big plantation companies. Some of the plantation companies are diversified companies and involve engineering activities, and can rely on their engineering division for the establishment mills and treatment plant. Moreover, the MPOI can bargain for competitive prices as their purchasing of machinery will continue in the future. As for the suppliers, they know they will achieve a continuous profit through the installation of new mills and services they provided to existing mills and refineries. Hence suppliers see the MPOI as an important partner and want to establish a long-term relationship for mutual benefits.

Financial institutions are also important suppliers to the MPOI. In the 1960s and the 1970s, the Malaysian government borrowed heavily from the World Bank to finance its FELDA scheme, however, the situation is different now; private plantations play a major role in the industry and they are financially capable. If they want to borrow money for their palm oil plantations they do not face a problem as there are many financial institutions available locally, and to secure finance is not a problem as the industry is profitable and less risky compared to other businesses. The MPOI can use their land bank as collateral.

In terms of labour, even though the industry at present faces a shortage of labour, the vacuum is being filled by immigrant labourers, especially Indonesians. They do not have bargaining power as they are hired on a contract basis. In addition, the push factor to work in Malaysia is high, Indonesian plantation workers know they will receive a higher salary than their counterparts at home. From the above discussion it is concluded that suppliers do not pose a major threat to the MPOI.

5.5.5 The bargaining power of buyers

The bargaining power of buyers is powerful when they buy products in a large quantity, they are few in number, the products they buy are standard or undifferentiated, they face few switching costs, and the quality of products or services is irrelevant to the quality of buyers' products (Porter, 1980 p.24). In 2005 the fifteen largest buyers of the MPOI's products were the EU, Russia, the US, Egypt, Saudi Arabia, South Africa, Australia, China, Hong Kong, Japan, South Korea, Bangladesh, India, Pakistan and Singapore (Table 5.7). Exports of palm oil, and oleo chemicals from Malaysia to these countries made up 80 percent, and 82 percent respectively. Among the top four largest customers of the Malaysian palm oil are China, the EU, India and Pakistan. These four countries together comprised more than half of the Malaysian export market for palm oil in 2005; due to the high volume of purchasing they have bargaining power over the MPOI. Furthermore, palm oil is considered as an undifferentiated product due to the presence of Indonesia as the second largest producer of palm oil, which makes it easy for these customer countries to switch to Indonesia. This situation could be more serious for Malaysia in the future, as Indonesia may be a leader, with advantages in terms of land and labour costs, is able to sell their products at a competitive price.

Based on these four criteria (volume of buying, number of buyers, undifferentiated products and alternative suppliers), we can conclude that these buyers have more bargaining power and may pose threats to the MPOI interests. However, the different situation is observed for oleo chemicals, the EU, US, China and Japan constituted more than 60 percent of export, they cannot easily switch to other suppliers. Indonesia and other producers of palm oil are lagging behind Malaysia in oleo chemicals. In the case of oleo-chemicals, buyers' threat is relatively lower than in the case of palm oil.

Table 5.7: ***Malaysia's Export Volumes and Value of Palm Oil and Oleo chemicals in 2005***

	Palm Oil				Oleo-chemical			
	Volume ('000 tonnes)	%	Value (RM Million)	%	Volume ('000 tonnes)	%	Value (RM Million)	%
EU	2,272.0	16.9	3,249.6	16.2	521.8	28.5	1,410.8	27.5
Russia	245.9	1.8	339.0	1.7	1.7	0.1	3.9	0.1
US	558.5	4.2	774.4	3.9	225.0	12.3	707.6	13.8
Egypt	608.8	4.5	886.6	4.4	7.6	0.4	18.6	0.4
Saudi Arabia	186.1	1.4	294.9	1.5	6.4	0.4	15.4	0.30
South Africa	232.2	1.7	327.4	1.6	13.4	0.7	29.4	0.6
Australia	115.4	0.9	173.5	0.9	14.4	0.8	45.7	0.9
China	2,960.5	22.0	4,270.9	21.3	267.9	14.6	753.1	14.7
Hong Kong	112.1	0.8	173.6	0.9	8.5	0.5	18.2	0.4
Japan	472.5	3.5	729.7	3.6	191.1	10.4	686.8	13.4
South Korea	229.3	1.7	333.1	1.7	76.0	4.1	193.4	3.8
Bangladesh	510.5	3.8	756.3	3.8	21.7	1.1	40.9	0.8
India	635.0	4.7	862.6	4.3	99.6	5.4	248.9	4.8
Pakistan	957.0	7.1	1,407.2	7.0	13.8	0.8	26.7	0.5
Singapore	346.8	2.6	563.9	2.8	53.3	2.9	152.2	3.0
Others	3002.9	22.3	489.3	24.3	312.2	17.0	786.2	15.3
Total	13,445.5	100	20,033.7	100	1,834.2	100	5,137.8	100

Source: MPOB (www.mpob.gov.my, accessed 4 April 2007)

5.6 The Competitive Advantage of the MPOI

According to Michael Porter (1985 p.11) to ensure sustainability in an industry one needs to choose the right strategy according to competitiveness of its industry based on the above-mentioned forces. There are three generic strategies that can be pursued to gain competitive advantage over competitors: *cost leadership*, *differentiation* and *focus.*

Cost leadership represents a strategic alternative that centres on outperforming competitors through efficiency rather than product quality and services. Businesses that pursue a cost leadership strategy will price their product competitively for large based customers. The cost efficiency is achieved through economy of scale, cheap labour costs, materials, and technology allowing them to out manoeuvre their competitors. Cost leadership strategy is suitable for a situation with price sensitive customers. However, such a strategy is pursued at the expense of the quality of product or services provided. On the other hand, the differentiation strategy aims at creating a perceived difference in the products that they offer to their customers. As with cost leadership strategy, it caters for large based customers. Ideally differentiation will occur in several dimensions, such as superior quality in products, and better service delivery, among others. Businesses that pursue this strategy are rewarded through a premium price as

customers are willing to pay extra for the associated values. Unlike cost leadership and differentiation, the focus strategy calls for a business to narrow its marketing target to small based customers. This focus enables the business to better meet the needs of the customers. Businesses can choose either cost leadership strategy or differentiation strategy to serve its focus market.

The option for business is to choose any one of these strategies that best suits its needs. Although some firms may be able to follow both strategies simultaneously, it is an exception rather than a norm. Porter (1985 p.16-17). argues that those who pursue both strategies will be 'stuck in the middle'. Such a firm is in trouble as neither can it attract high volume customers associated with low price nor customers associated with the differentiation strategy. Moreover, such a firm is susceptible to competitors who emphasise either low cost or differentiation strategies.

So, in the case of the MPOI which competitive strategy does it need to pursue to ensure its sustainability in the industry? Using Porter's 5 forces analysis, it is clear that two major threats to the MPOI come from two key forces: internal rivalry; and buyers' bargaining power. In the former case, Indonesia is a major threat to the MPOI. Indonesia has an edge over Malaysia in terms of production costs - cheaper labour resources and land. Moreover, with the advantages of ample available land for palm oil plantations they will replace Malaysia as a leader in the industry in the very near future. In relation to buyers, a threat comes from importing countries who buy the Malaysian palm oil in large volumes - China, India, European Union and Pakistan. Due to their high purchase volumes they have considerable bargaining power. Malaysia is susceptible to their actions, and if any of these countries refuses to buy the Malaysian palm oil; it would cause a significant problem for MPOI.

What is a suitable strategy for the MPOI? A suitable strategy is a strategy that enables the MPOI to reduce threats from both forces - Indonesia, and its major buyers - and at the same time capitalise on the MPOI's strengths in the industry. As a result, the best strategy to cater for both needs is differentiation. By exploiting a differentiation strategy, the MPOI can leap ahead technologically from its Indonesian counterpart. Additionally, it can also strive to employ industry measures which will avoid the negative publicity of the Indonesian palm oil industry of an environmentally unfriendly

practice. For example, although the forest fires that affected the whole of South East Asia were largely due to irresponsible companies in Indonesia, the MPOI also came under strong criticisms.

Therefore, the next question is how to differentiate the Malaysian palm oil industry against Indonesia's? In this respect the MPOI needs to compete in terms of the higher quality of its palm oil products. This leads to yet another question; what quality the MPOI wants to attach to its product? Looking at the increasing number of green products in developed societies at present, and the anticipated exponential growth of these in the near future in developing countries, the best option for the MPOI to sustain its present position in the industry is to choose a differentiation strategy. The MPOI needs to project itself as a producer of environmentally friendly palm oil. This will give the competitive advantage to the MPOI over its competitors, as such a differentiation attaches an environmentally friendly image to its product. By doing so it also reduces strong criticisms against the palm oil industry from its customers and NGOs that the industry is the root cause of deforestation in Malaysia. At present there is only one type of palm oil in the market. Alternative to this is environmentally friendly palm oil.

The aim is towards establishing an environmentally friendly oil palm category within the MPOI. A green certification from a third party is essential as to ensure that the product is truly what it represents itself to be. Environmentally friendly palm oil needs to be defined clearly and this can be used as a basis for certification. This is essential to avoid so-called 'free riders' who give false claims to their products as environmentally friendly. As for customers who value environmental quality attached with the product, they are willing to pay price premium.

There are two categories of buyers of the MPOI products, rich and developed countries and developing countries. In 2005, the percentage of palm oil and oleo chemicals imported by rich and developed countries were 30 percent and 85 per cent respectively (refer to Table 5.7 on page 171). It is clear that they dominated the purchase of oleo chemicals. The introduction of environmentally friendly palm oil will not only enhance Malaysia's market in developed countries but also boost its downstream activities, as consumers in developed countries become confident enough that the product that they are buying comes from environmentally friendly palm oil.

In terms of bargaining power, customers in developed countries have greater bargaining power. Generally speaking, they are wealthier and environmentally conscious in their purchasing as well. They have acknowledged and are aware that the expansion of the palm oil industry has had negative impacts on tropical rainforests. An increasing number of them demand environmentally soundly palm oil products. As a result, distributors or suppliers of palm oil have their own standard when buying palm oil. In addition, ENGOs have highlighted the negative impacts of the industry on biodiversity of tropical rain forests and urge their government to impose restrictions of the import of palm oil.

On the other hand, customers in developing countries are more price sensitive. The main reason for buying palm oil is due to its competitive price in relation to alternative products. Unlike their developed-societies counterparts, they are less concerned about the environment. At present only a handful of developing countries are environmentally conscious, and they are not willing to spend extra money in the cause of the environment. However, due to an increasing number of educated and middle class populations, who are more knowledgeable about environmental issues and coupled with their financial strength, a demand for environmentally friendly products will increase in the near future. China and India are good examples. These two countries are the most populous nations in the world. If 5 percent of their populations are more environmentally conscious and prefer to buy environmentally friendly products at prices that are 10-15 percent higher, this would be considered attractive enough by the MPOI to warrant the production of environmentally friendly palm oil. This kind of differentiation would be advantageous since, at present, there is only one type of oil and Malaysia competes with Indonesia in terms of competitive price, and is at a disadvantage because Indonesia has lower costs.

At present, not many palm oil producers are seriously working towards a green solution and marketing such an environmentally friendly product. If Malaysia becomes the leader it will enjoy a large range of advantages including: (1) *reputation* - when MPOI moves first into environmentally friendly palm oil products it may establish a reputation as the pioneer, a reputation that emulators will have difficulty in overcoming. It also would be the first to provide buyers with these new products, and thus to establish relationships where loyalty develops; (2) *channel selection* – a first mover may gain

unique channel access for environmentally friendly products. At present there are a number of food chain distributors in Europe such as Migros from Switzerland and Karlshamms AB from Sweden who buy palm oil from selected companies based on this criterion; and (3) *definition of standards* - the MPOI can define the standards for environmentally friendly palm oil products to its advantage, forcing later movers to adopt them. For example, in agricultural practices, processing, and waste treatment to name but a few - these standards will in turn make the MPOI's position more sustainable, as it may be difficult for others to duplicate them.

It is possible to achieve this goal of differentiation through higher quality products as Malaysia has relative advantages over Indonesia in environmentally friendly technology, regulatory measures, government support, marketing strategies and close cooperation with industrial associations.

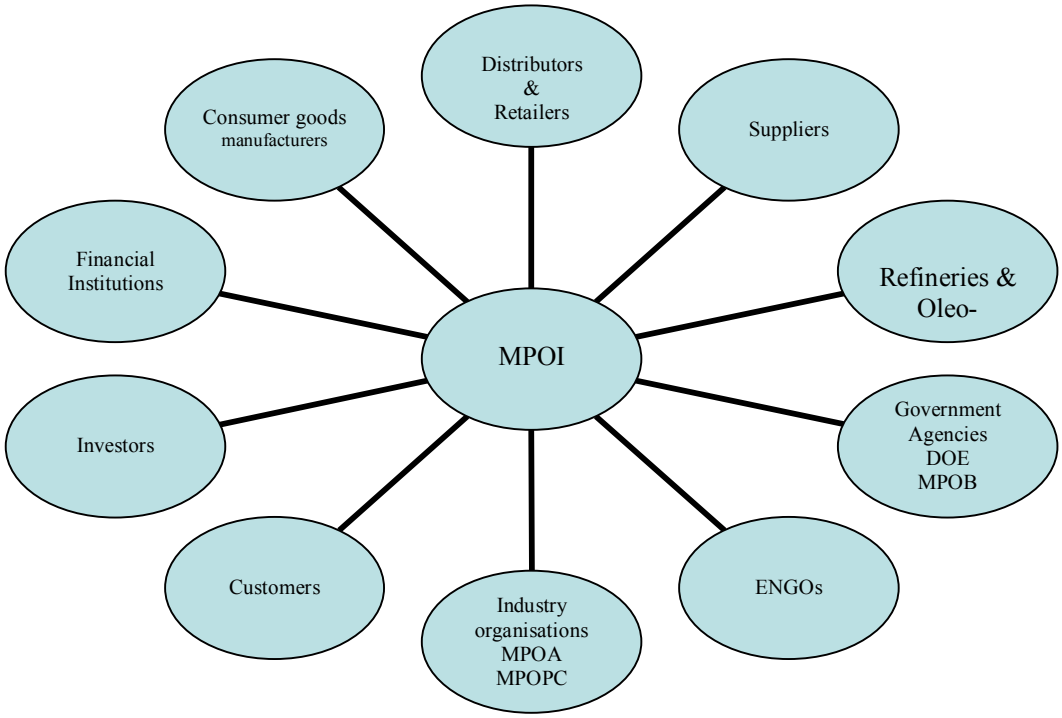
In environmental management, in the past twenty years since the introduction of the EQA 1977 (Prescribed Premises) (Oil Palm), Malaysia has developed its own POME treatment. Recently, zero effluent technology has become available. This technology, unlike the conventional one, is a clean technology in which no effluent will be discharged into water courses; instead POME is recycled into fertilizer. Although such technology is more expensive, in the long run it has proven cost effective as the demand from customer increases. Moreover, existing environmental regulation is expected to be tougher, as more and more Malaysians are increasingly concerned about the environment, and they exert an influence on the government to amend existing law and/ or deploy enough resources for enforcement. A strict environmental law is considered a competitive advantage rather than hurting the business (Porter & van der Linde, 1995a). In the long run, not only is this strategy more environmentally responsible but also necessary to ensure sustainability of the industry.

Differentiation strategy through environmentally friendly palm oil is more demanding, as Malaysia does not have more land to increase its oil palm area. Over the last two decades as the MPOI encroached into unsuitable lands (for instance wetlands and marginal lands), the result has been a very low yield per hectare. Moreover, these lands are considered as sensitive areas and any development will easily damage their fragile ecosystems. In the future, the expansion of plantation areas will likely be from

utilization of disturbed areas such as mining areas, and rubber plantations, instead of sensitive areas like tropical rainforests and wetlands (Henson, 1994). Not only does such a strategy fulfil demand from developed countries' customers, but at the same time can dispel criticisms from both local and international NGOs. The RSPO is a good platform to define sustainable palm oil. In this sense, cooperation with NGOs is vital; especially in the areas in which they are more expert, such as conservation and sustainable agricultural practices. In addition, to use more environmentally responsible practices helps market the MPOI's products internationally. Unlike the previous approach, where plantation companies looked for new plantation areas to increase their output, they need to have paradigm shift, such that increment of output must solely come from increase of yield per hectare. This will encourage these players to pay more attention toward agricultural practices. Achieving this strategy requires a close cooperation among various groups in the industry supply chain, as depicted in Figure 5.1 (although this list of players in the supply chain is by no means exhaustive). All groups play their own roles pertaining to environmental management.

The government role here is reflected by its departments or agencies, such as the MPOB and DOE. At present, even though pollution preventive technology is developed by MPOB, the industry has been slow to embrace it. Some efforts are needed to promote such technology. The DOE must ensure the MPOI adhere to the environmental regulation through ongoing inspection and monitoring. As for upstream producers, there should be no more oil palm plantations involving deforestation of tropical rainforests and sensitive areas, and no air and water pollution caused by palm oil mill activities. Downstream producers need to ensure their activities are sustainable too, they must ensure that they buy palm oil from environmentally certified millers or companies. As for industrial organisations such as the MPOA and Malaysian Palm Oil Promotional Council (MPOPC), the environmental issues must be given more priority. Efforts must be taken to ensure members pay due recognition to environmental issues for the survival of the industry as a whole. For those who fail to embrace environmental measures, pressure from the members of the organisations will force them to make a move.

Figure 5.1: ***Major players in the Sustainable Palm Oil Chain in Malaysia***



Source: www.rspo.org, Accessed on 7 July 2005

5.7 Summary

This chapter has discussed the contemporary MPOI and the environment since 1990. The first section looked at the growth of the industry during the period, its impact on the environment, as well as various stakeholders' pressures on the industry to be environmentally conscious. The decade after 1990 witnessed other new developments in the industry. Unlike in the previous decades, FELDA had reduced its oil palm expansion, but private plantation companies started to aggressively open up their plantations in East Malaysia and to extend a little into Indonesia. In 2003, of the 3.8 million hectares total area planted with oil palms, 60 percent was under private plantations. The growth of private plantations during this period largely contributed to the expansion of new plantations in Sabah and Sarawak as land in the Peninsula has become scarce.

It is clear that the growth of MPOI has been at the expense of Malaysian rainforests. When suitable land was no longer available in Peninsular Malaysia, palm oil companies

moved to Sabah and Sarawak and repeated the cycle of forest destruction. When almost all suitable lands were already converted to oil palms, plantation companies moved to sensitive areas like upland and wetland to use as plantation grounds. The conversion of forests into oil palm plantations has a far reaching impact on the environment and local communities; it leads to the complete loss of some species of mammals, reptiles and birds. Notably in Sarawak the expansion of oil palm plantations not only damaged forests ecosystems but also threatens social and culture of the indigenous people in the state. In terms of level of environmental compliance with EQA 1977 (Prescribed Premises) (Palm Oil Mills) for palm oil mill effluent, the rate in this period was still around 80 percent and some millers were still charged in courts.

Although the DOE imposes pressure on the MPOI, the problem with the DOE has long been recognised as a lack of enforcement of its regulations, as well as the imposition of punishments that are too lenient to prevent palm oil companies from repeating the same offence. This is further compounded with some loopholes in EIA regulations. Firstly, in Malaysia an EIA is not intended to prevent a project from proceeding, but rather to force the incorporation of environmental considerations into planning process. Secondly, even though developers are required to get permission from the DOE before they could begin their projects, often the projects started upon approval from the state government. This was due to an ambiguity of power of the DOE in relation to state approving authorities. The situation has been made more complicated when the state governments had vested interests in the projects. Thirdly, the inability of the DOE to force developers to comply with the mitigation measures included in their EIA reports. Finally, the fact that EIA procedures in Malaysia do not often include public consultation.

Unlike in the past, ENGOs in Malaysia are increasingly exerting their pressure on both the government and the industry to be more environmentally conscious. Overall, ENGOs resorted to a hard approach such as confrontation and/or a soft approach such as cooperation. In the former, especially in Sabah and Sarawak, they worked with local communities who were negatively impacted by the industry. They confronted the government and the MPOI through protests, blockades and court action. For the latter, ENGOs tried to engage the government and the industry in environmental discourse and a joint-venture project. Meanwhile, there are some positive signs in environmental

management in the MPOI. Some players, notably big companies have been more proactive. They not only exercise environmental management practices which are deemed necessary according to the regulation and have a cleared economic values in terms of efficiency, but move one step further to embrace voluntary environmental practices such as ISO 14001 environmental management system (EMS).

In the second section of this chapter, Porter's 5 forces (internal rivalry, threat of new entrants, threat of substitute products, bargaining power of buyers and bargaining power of suppliers) were used to analyse the industry's competitiveness. This led to suggestions of the suitable strategies to gain competitive advantages as well as to be more sustainable. Among those forces internal rivalry and threat from buyers received more attention. As a rival, Indonesia was identified as a major threat to the MPOI. It was clear that as the market share of Indonesian's palm oil has increased over time it has eroded a percentage of Malaysian market share. In respect to buyers, it was observed that the customers of Malaysian palm products were divided into developed and developing countries. In terms of palm oil market, a majority of buyers came from developing countries, however, the different situation is observed for oleo chemicals, the EU, US, China and Japan constituted more than 60 percent of export.

Analysing this situation, the researcher is of the opinion that differentiation would be the best strategy for the MPOI. By harnessing differentiation strategy, it can launch itself ahead of its Indonesian rival. Additionally, it can also avoid negative publicity of environmentally unfriendly practices of the Indonesian palm oil industry. Looking at the increasing number of green consumers in developed countries at present, and the expected growth of this market in the near future in developing countries, the option would be promising. This would give the competitive advantage for the MPOI over its rivals as such a differentiation attaches an environmentally friendly image to its product.

The extensive literature review (in chapters Two and Three) as well as the background information on the early development of the MPOI and the environment in chapter Four, and the contemporary MPOI and the environment since 1990 in this chapter, were instrumental in laying a sound theoretical base and providing a framework for this research. The following chapters will now be directed to define and explain the research problem, questions, objectives, as well as the research methodology.

Chapter Six

Research Methodology

6.1 Introduction

This Chapter will define the research problem, questions, and objectives as well as the research methodology. Details of the study design, data collection, analysis, reliability and validity of both quantitative and qualitative methods are also included. The quantitative and qualitative research methodologies are outlined and the use of multiple case studies and a triangulation method are explained.

6.2 The Research Problem and Questions

The research process begins with the identification of the research problem and the research questions. The research problem in this study is arrived at through the review of the literature as well as the background of the MPOI. The problem identified in this study is how to make the MPOI more environmentally sustainable? A number of research questions will be asked to assist this research:

1. What types of environmental strategies have the MPOI adopted?
2. How and to what extent does the management of each strategy proactiveness group respond to environmental stakeholders' pressures?
3. Is there any difference in the effectiveness of the various environmental strategies adopted by the MPOI?
4. Is there any difference in the level of competitive advantage of various environmental strategies adopted by the MPOI?
5. Do size and resources of the companies determine the level of environmental strategies?
6. What environmental strategies should the MPOI adopt to be more environmentally responsible?

6.3 Aim and Objectives

The main aim of this study is to understand how and to what extent environmental stakeholders exerted influence on the MPOI and how the industry adopts, and adapts, its environmental strategies to respond to these pressures. The objectives are:

1. to generate a better understanding on how stakeholders play their roles to exert pressure on businesses in relation to environmental issues.
2. to know what types of environmental strategies are adopted by the industry
3. to know what size and resources the industry has to better deal with these pressures.
4. to measure the effectiveness of the Malaysian Palm Oil industry environmental strategies.
5. to know what competitive advantages the Malaysian Palm Oil industry gains through their environmental strategies
6. to provide recommendations to both the palm oil industry and relevant bodies that determine public policy on how to increase the proactiveness of environmental strategies of the Malaysian Palm Oil Industry.

6.4 Research Approach

According to Easterby-Smith, Thorpe and Lowe (2002 p.28) social research has philosophically two approaches: either positivism or social constructionism. A positivism approach reflects that the social world exists externally and its properties should be measured through objective methods. The quantitative paradigm is based on positivism. Science is characterized by empirical research where all phenomena can be reduced to empirical indicators that represent the truth. The ontological position of the quantitative paradigm is that there is only one truth, an objective reality that exists independent of human perception. Epistemologically, the investigator and investigated objects are independent entities. Thus, the investigator is capable of studying a phenomenon without influencing it or being influenced by it. This phenomenon is what Guba and Lincoln (1994 p.110) expressed as 'inquiry takes place as through a one way mirror.' The goal of quantitative type of research is to measure and analyse causal relationships between variables within a value-free framework (Denzin & Lincoln, 2005 p.10). The quantitative method involves randomization, highly structured protocol, and

administered questionnaires with a limited range of predetermined responses. Sample sizes of quantitative method are much larger, thus ensuring the study's samples are representative of the whole population of the phenomenon under investigation (Easterby-Smith *et al.*, 2002 p.29).

On the contrary, a social constructionism approach views the world as socially constructed and subjective. Social constructionism is one of a group of approaches that Habermas (1970, cited in Easterby-Smith *et al.*, 2002 p.30) has referred to as interpretive methods. As far as the ontology of the approach is concerned, there are multiple realities based on one's construction of reality, which is constantly changing over time. In the qualitative approach the investigator and the object of study are interactively linked so that findings are mutually created within the context of the situation that shapes the inquiry (Guba & Lincoln, 1994). This suggests that the reality has no existence prior to the activity of investigation, and the reality ceases to exist when the investigator no longer focuses on it. Qualitative research stresses the process and meanings of the topic of interest. Techniques used in qualitative studies include in-depth and focus group interviews and participant observation. Samples are not meant to represent large populations; rather small purposeful samples are used to provide valuable information. Since the early 1980s there has been a trend away from positivism towards constructionism (Easterby-Smith *et al.*, 2002 p.28). Table 6.1 describes the differences between these two approaches.

Table 6.1: ***Differences between Positivism and Social Constructionism***

	Positivism	Social Constructionism
The observer	must be independent	is part of what is being observed
Human Interest	should be irrelevant	are the main drivers of science
Explanations	must demonstrate causality	aim to increase general understanding of the situation
Research progresses through	hypotheses and deductions	gathering rich data from which ideas are induced
Concepts	need to be operationalized so that they can be measured	should incorporate stakeholder perspectives
Units of analysis	should be reduced to simplest terms	may include the complexity of 'whole' situations
Generalization through	statistical probability	theoretical abstraction
Sampling requires	large numbers selected randomly	small numbers of cases chosen for specific reasons

Source: Table 3.1 from Easterby-Smith *et al.* (2002). *Management research: an introduction.* London, Sage. p.30

Each of these approaches has its own strengths and limitations (Patton, 2002). In the case of quantitative approaches, the main strengths are that they can provide wide coverage of the range of situations; and they can be fast and economical, particularly when statistics are aggregated from large samples. However, drawbacks of these approaches are: they are inflexible and artificial; they are not very effective in understanding processes or the significance that people attach to actions; and they are not very helpful in generating theories.

On the other hand, qualitative methods tend to allow more depth and detail than quantitative methods. They also provide a way of gathering data that is seen as natural rather than artificial. Qualitative data is a source of well grounded, rich descriptions and explanations of processes occurring in a local context (Miles & Huberman, 1984 p.106). Among the weaknesses of qualitative methods are: that a great deal of time and resources are required for data collection; and the analysis of data may be very difficult and cumbersome.

Although the distinction between both paradigms may be very clear at the philosophical level, when it comes to the choice of specific methods, and to the issues of research design, the distinctions between them often break down (Bulmer, 1988 p.160). A combination of these paradigms (quantitative and qualitative), commonly known as triangulation, in a single research study compensates for the weaknesses of each method by counter-balancing the strengths of another. It is assumed triangulation do not share the same weaknesses or potential for bias (Rohner, 1977 p.134). Increasingly, authors and researchers who work in organizations and with managers argue that one should attempt to mix both methods to some extent, because this provides more perspectives on the phenomena being investigated (Easterby-Smith *et al.*, 2002 p.41).

6.5 Case Study

In social science research there are a number of strategies that can be used to conduct research: case studies, experiments, surveys, histories and analysis of archival information (Yin, 2003 p.1). The selection of a suitable method generally depends on: first, what the research question is; second, the control a researcher has over the actual events and third, the focus on contemporary phenomena. As far as a research question is

concerned, case studies are the preferred strategy when 'how' or 'why' questions are being posed. The research questions of this study - how and why the MPOI adopts corporate environmentalism in their business - closely fits Yin's (2003) 'how' and 'why' forms of research question. In terms of investigator controls over the events, a case study is applicable to empirical inquiries when the investigator has little control over events (Yin, 2003 p.1 & 13). In a corporate environmentalism study of the MPOI, the investigator has no control over such industry practices: socio-political and economic factors in the local and international climate strongly dictate these practices. Moreover, a case study is preferred when the focus is on a contemporary phenomenon within some real-life context, especially when the boundaries between the phenomenon and context are not very clear (Yin, 2003 p.1 & 13). This undeniably relevant, study on corporate environmentalism is a new research field, still in its infancy, and it is especially relevant in the context of developing countries where a dearth of such a research been conducted. Since this study on corporate environmentalism in the MPOI industry satisfies all three of these criteria, a case study methodology is preferred.

In general, there are two types of case study: a single case study and a multiple case study. This research utilises a multiple case study design, where a number of palm oil companies are involved in the research. It is important to note here that the study is not a review of management change pertaining to environmental management but rather a focus on perception of management of the stakeholders' pressure on the industry, and how the industry reacts to these pressures, as shown through its environmental strategy. It is not a longitudinal analysis but rather a cross-sectional analysis of a specific snap-shot in time.

6.5.1 Multiple Case studies of Malaysian Palm Oil companies

The purpose of this section is to discuss a number of parameters and boundaries to delineate the area under investigation. In particular, why has the MPOI been chosen for the study of corporate environmentalism? First, the palm oil industry is the most important agricultural commodity industry in Malaysia and contributes substantially to the economy. In 2003 its earnings from foreign exchange contributed more than RM20 Billion (US$5 Billion), amounting for 45.9 percent of the export earnings from commodities and 6.5 percent of the whole country's total export earnings (The Malaysia

International Commodity Conference & Showcase, accessed on 12 June 2005 at http://www.miccos.com.my,). Second, the industry provides employment to about 567,4000 workers in private plantations, government schemes and independent smallholdings; taken together with those who are linked to the palm oil industry in both the upstream and downstream sectors, approximately 1 million out of the total 10 million Malaysian workforce are engaged in the palm oil industry (Chandran, 2005). Nevertheless, the successful growth of the industry has its environmental costs; this is the third reason why a study of corporate environmentalism of this industry was chosen.

In Malaysia, the palm oil industry together with forestry, rubber, tin and chemical-based agriculture are considered environmentally damaging activities (Wong, 1998 p.2). Types of negative environmental impacts caused by the activities related to the industry are numerous. In planting, environmental impacts are deforestation, depletion of flora and fauna, soil erosion and sedimentation. In addition, air pollution occurs when operators use fire for land clearing. On the established plantations, various pesticides and artificial fertilizers are continuously applied for the 'health' of the oil palms. Additionally, processing of FFB at palm oil mills uses a large amount of fresh water, since for every tonne of FFB one tonne of water is required (Chuan, 1982 p.10). Untreated POME often pollutes rivers near to the mills. Moreover, palm oil mills emit black smoke when EFB are burnt for manure and to produce steam to sterilise FFB to facilitate the extraction of the palm oil. As a result of this range of harmful activities, the industry is one of the most highly regulated industries in Malaysia.

Methodologically, only private Malaysian palm oil companies will be involved in this research. Private companies are involved in this study for three main reasons. These companies are major players and increasingly more important to the industry. At present close to 60 percent of total area under oil palm in Malaysia is run by private palm oil companies. Since no more new oil palm plantation areas are available for development under FELDA (government scheme), at present and in the near future, the expansion of the plantations and other related activities will only come from these large palm oil companies. Secondly, private plantation companies are business organisations that have proper organisational structures that enable them to plan and implement corporate environmental management in their organisations. Although FELDA is another important industry member in the country, the organisation is run like a cooperative and

its management is directly controlled by the government. Finally, only the private plantation companies have the resources and capabilities to decide which strategies they want to pursue pertaining to corporate environmentalism in their organisation.

The list of palm oil companies on the Kuala Lumpur Stock Exchange (KLSE) was used as sampling frame of this study. Altogether 37 palm oil companies are listed on the stock exchange. There are two categories of palm oil companies; first - plantation companies whose main revenue comes from the palm oil industry; and second - diversified companies in which palm oil revenues are only part of their businesses activities. These companies not only have their own plantations (more than 10, 000 hectares to close 150,000 hectares) but also have their own palm oil mills. Only a handful of them have their own refineries. Some that are considered as main players in the MPOI have diversified into the downstream sector of the industry and have their own oleo chemicals plants. Many have expanded their business outside Malaysia, and are involved in plantation activities in Indonesia, Papua New Guinea and Solomon Islands. Others smaller companies only operate their businesses in Malaysia.

Due to the small number of private Malaysian Palm Oil companies, all of these companies were approached in the study. The details of these Malaysian palm oil companies were taken from the KLSE website. Since some have been involved in mergers and acquisitions due care was given when sending an invitation letter to parent companies. As well, the researcher needed to consider newly listed plantation companies on the stock exchange.

Prior to the field work (early March 2006), the researcher sent letters to all CEOs or General Managers of these companies and invited them to take part in this study. In the letter, the researcher introduced himself and explained the aim of his study, the number of prospective respondents in each company, and the confidentiality issues. As upper level management usually plays a vital role in design of environmental policy (Banerjee, 1998; Maxwell, Rothenberg, Briscoe, & Marcus, 1997) only those in positions at managerial levels were approached in the study. In each company, four participants from various managerial levels were sought to gain information. To provide more detail of what questions would be asked, a set of questionnaires were sent to prospective companies (Appendix A). Providing the questionnaire with the invitation

letter was a strategy adopted to reduce uncertainty, and also it was hoped, to increase willingness to participate in the study as the prospective companies could see what information would be sought from the questionnaires. In the letter, the researcher also mentioned that he would ask participants to elaborate with more details of certain key points from the survey during a meeting. A semi-structured interview protocol (Appendix B), which was developed based on quantitative data, was also attached with the letter of invitation.

However, a month after the invitation letters had been sent to prospective companies, none of them had responded to the researcher. Initially, the researcher thought to proceed with a reminder letter, but having considered the culture of business organisations in Malaysia, which does not usually favour a response to any invitation letters, especially for research purposes, the researcher chose to contact all prospective companies on the phone. When each of the companies was contacted, seven companies immediately informed the researcher that their companies would not participate - a typical answer was 'it is our company policy not to allow outsiders to conduct a study on our company'. Another ten companies stated that they had yet to make any decision whether to participate or not; and the final twenty companies' representatives asked the researcher to send the same invitation letters back to them for consideration. After these letters were sent to these companies, and followed by another series of phone calls, in the end only 9 companies voluntarily agreed to participate. All of these are government-linked companies (GLCs). None of non-GLCs agreed to participate in this study.

The fact that the other 28 palm oil companies were reluctant to participate in the study came as no surprise at all. Since this is a sensitive industry that has received bad publicity internationally, especially in regard to deforestation, it is not easy for them to allow an external party to conduct any environmental study on them. One human resources manager from a company in Sarawak told the researcher that his company would not allow researchers, especially from foreign countries to carry out an environmental study on his company as he was afraid the results would be used against his company. However, he allowed the researcher to conduct this study on the grounds that the researcher is a Malaysian and teaches in a local university.

Of the original 37 prospective companies, one company had merged with a larger company, so this left 36 companies in the population. Thus this study based on nine companies, only represents 25% of the total number of plantation companies on the KLSE. The plantation size of these companies varies from between 15,000 to around 150,000 hectares. Only some have oil palm plantations in Malaysia, while some others are international in their operation and have oil palm plantations outside Malaysia. In each company, the researcher managed to approach 4 management personnel from various departments. Altogether 36 surveys were completed and 36 interviews were conducted. Most of the interviewees (32) allowed these conversations to be audio-taped, except for 4 who declined permission for the conversation to be audio-taped but agreed to the researcher taking notes despite the researcher assuring them of the confidentiality of the conversation. The first reason for refusal was because they were afraid their words would be used against their companies, and secondly, they felt uncomfortable discussing aspects of their companies, especially related to sensitive issues.

To gain a rounded view of stakeholders' pressure in relation to the palm oil industry, the researcher also approached nine different stakeholder groups related to the industry. They were: the media, DOE, the State Environmental Protection Department of Sabah (SEPD), ENGOs, local community groups, a law firm, the Malaysian Palm Oil Association (MPOA), the Malaysian Palm Oil Board (MPOB), and the Ministry of Plantation Industries and Commodities. In all 18 invitation letters were addressed to the MPOI's stakeholders: four letters to different mainstream media in Malaysia (two daily Malay vernacular newspapers, one daily English newspaper, and a bi-monthly Malay and English newspaper), three letters to the DOE (one to the central head office and two to state branch offices), five to various ENGOs, two to local community organisations, and a letter each to SEPD, a private law firm, the MPOA, the MPOB, and the Ministry of Plantation Industries and Commodities. The semi-structured interview protocol (Appendix C) was also attached with each invitation letter.

As was the case with the palm oil companies, the initial response from these stakeholders was not encouraging; only the MPOA and one ENGO replied to the letter and expressed their willingness to participate. The researcher managed to interview 15 individuals from various stakeholder organisations: 4 from different newspaper companies, 3 from the DOE (1 from federal, and 2 from state offices), 1 from the

SEPD, 3 from ENGOs (WWF, SAM and MNS), 1 from a local community organisation (later included with ENGOs), 1 from the MPOA, 1 from the MPOB, and a law practitioner who heads a law firm in Kelantan. Of these interviews, 13 respondents agreed to audio-taped conversations, but two respondents, the representatives of MPOA and SEPD declined nevertheless agreed to the researcher taking written notes.

In total 45 taped interviews (from 32 palm oil company representatives and 13 industry stakeholders) were transcribed, together with notes from the remaining six interviews. The interviews took between 45 minutes to two hours to complete. Overall, respondents were very cooperative. All interviews were conducted at the interviewees' premises at a time arranged for their convenience.

Unlike a survey, the objective of applying qualitative research is to achieve 'information richness'.In the interviews the researcher had to maintain a degree of flexibility and openness. So during each interview the researcher allowed interviewees to develop the discussion in the directions that each respondent preferred. It was not always possible to ask each question in an exact order according to the protocol. As a result, each interview was slightly different, but importantly the same topics were touched upon, thus enabling comparisons of the responses to be made during the analysis of the data. It is important to highlight here that information gained from the interviews was by no means exhaustive. The researcher was overwhelmed by the richness and vast amount of information gathered in this qualitative analysis. In a qualitative analysis the researcher does not sum up every single comment or answer by the respondents, instead emphasis has been given on those statements that were relevant to the research questions. When quotations have been extracted from the interview, their purpose is to provide depth and richness to the analysis and interpretation of the findings.

During the visits, the researcher was only able to collect 5 companies' annual reports and three companies' environmental policies. Overall, respondents were reluctant to provide printed information related to environmental management. In two cases, when the researcher asked for copy of their environmental policies, the respondents asked the researcher to get permission from their headquarters.

6.5.2 Limitations of Using Case Study Research

Using a case study as a research strategy is not without its limitations. According to Yin (2003 p.10) many research investigators disdain the case study as an appropriate research strategy. First, concern has been expressed over the lack of rigor of case study research. This can occur if the case study researcher has not followed systematic procedures, or has allowed equivocal evidence or biased views to influence the direction of findings and conclusions. A second common concern about case studies is that they provide little basic information for scientific generalization. However, the main goal of a case study is to expand and generalize theories (analytic generalization) (Yin, 2003 p.10). A third frequent complaint about case studies is that they take too long and result in massive, unreadable documents.

Hussey and Hussey (1996 p.67) also recognised some weaknesses of the case study approach. Access to a suitable organisation is often difficult to negotiate and the process of the research can be very time consuming. It is also difficult to decide on the limitations of study. Although the case study will focus on a particular organisation, the organisation does not exist in a vacuum, but interacts with the rest of society. Whatever unit analysis is chosen, it will have a history and a future that will influence a researcher's understanding of the present.

From the above perspectives there is the possibility that different views of social reality can affect data interpretation. Moreover, the influence of the researcher's own experience can increase research bias. To reduce data interpretation and bias problems the use of multiple sources of evidence and a theoretical framework were used in the study. The framework is adjusted to allow the inclusion of new facts and ideas and provides guidance for data collection and analysis. Furthermore, the use of multiple sources of evidence should increase the opportunity for checking interpretations and identifying patterns.

Data for these multiple case studies came from triangulation of two main sources of evidence: a quantitative survey and a semi-structured interview. These two sources of evidence are highly complementary. The incorporation of these sources will increase the case study quality substantially. According to Yin (2003 p.99) the use of multiple

sources of evidence in case study allows an investigator to address a broader range of historical, attitudinal, and behavioural issues. However, the most important advantage offered by using multiple sources of evidence, according to Yin (2003), is the development of converging lines of inquiry. The notion that using triangulation or mixed method research (quantitative and qualitative method) in a case study of Malaysian palm oil corporate environmentalism is more convincing than relying on any one approach is also supported by Crompton and Jones (1988 p.72) who said:

> [Q]uite simply, that in organizational research it is not a mutually exclusive decision between quantitative and qualitative methodology. In the reality it is very difficult to study organizations without using both sorts of methods. In any event quantitative data always rests on qualitative distinctions.

A combination of a survey (quantitative) and qualitative research fits with this study as corporate environmental management research is a new developed academic subject; this being especially true in developing countries where research in this area is still lagging. As a result, any findings or conclusions in a case study using triangulation are likely to be much more convincing and accurate since it is based on several different sources of information.

6.6 Triangulation

Webb, Campbell, Schwartz and Sechrest (1966) and Denzin (1970) were among the first to introduce the term 'triangulation' into the social science discipline as a research approach. Triangulation is broadly defined by Denzin (1978 p.291) as 'the combination of methodologies in the study of the same phenomenon'. Another broad definition of triangulation is from Scandura and Williams (2000 p.1252), who described triangulation as: 'the involvement of more than one research strategy or approach'. A more narrow definition of triangulation is provided by Stake (2005 p.454): 'a process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation.'

Denzin (1978) and Patton (1987) identified four types of triangulation - data triangulation, investigator triangulation, theory triangulation, and methodological triangulation. Data triangulation refers to the gathering of data at different points in time or from different sources. Investigator triangulation is the use of multiple researchers to

study the same research questions or the same setting, presuming that different researchers will bring different perspectives, thinking and analysis, thus strengthening the final assessment. As far as theory triangulation is concerned, research should examine the phenomenon from different theoretical vantage points to see which would be the most robust in helping to clarify and explain what has been studied. Methodological triangulation refers to the use of multiple methods to gain the most complete and detailed data possible on the phenomenon.

According to Blaikie, (1991 p.115) the main reason for using triangulation is to reduce bias as well as to increase validity of a research that uses only one research method - either quantitative or qualitative. As he observed, 'the common theme in discussions of triangulation has been the desire to overcome problems of bias and validity. It has been argued that the deficiencies of any one method can be overcome by combining methods and thus capitalizing on their individual strengths'. In research potential biases can be identified through methodology, data and investigators. If one uses only one method, for example a closed questions interview, the data are limited to responses to the specific questions and especially the categories provided. Other, possibly more important information is not included. Therefore, the results will be biased towards the preconceived categories provided by researcher during conversation.

Writing in 1967, Glaser and Strauss (1967 p.18) stressed the need of triangulation as they claimed: '[In] many instances, both forms of data are necessary – not quantitative to test qualitative, but both used as supplements, as mutual verification'. Moreover, the use of both methods need not conflict with the research philosophy.

Consistent with other researchers, Bryman (1984 p.86) also believed that combining quantitative and qualitative methods is a process of validation by triangulation of the data collection techniques and comparing the findings. On the other hand, Flick (2002 p.227) argued that triangulation is not a tool or a strategy of validation, but an alternative to validation. According to him the combination of multiple methodological practices, empirical materials, perspectives, and observers in a single study is best understood then as a strategy that adds rigor, breadth, complexity, richness, and depth to any research inquiry.

Nonetheless, triangulation itself is not without some criticisms. Fielding and Fielding (1986 p.33) argued that 'theoretical triangulation' does not necessarily reduce bias, nor increase validity. According to Fielding and Fielding (1986 p.33) theories are generally the products of quite different traditions, so when they are combined, one might get a fuller picture, but not a more objective one. They added that, 'we should combine theories and methods carefully and purposefully with the intention of adding breadth and depth to our analysis but not for the purpose of pursuing objective truth.'

According to Fielding and Fielding (1986 p.34-35) some problems with triangulation, as outlined in the above discussion, can be avoided by: (i) analysing each type of data separately according to sound principles of each category; (ii) deciding whether to merge data via a statistical or a conceptual approach. The former is preferred if variables are distinct, whereas the latter is preferred when searching for logical patterns of relationship and meanings; (iii) focusing the research questions; (iv) ensuring that the strengths and weaknesses of each method offset the other; (v) selecting methods according to their relevance to the nature of the phenomenon being studied; and (vi) continually evaluating the chosen approach throughout the course of the study.

6.7 Qualitative and Qualitative Research

The two phases in this research are: quantitative and qualitative research. The main aims of qualitative research is not only to validate the findings of the quantitative research but at the same time to answer the 'why' questions pertaining to corporate environmentalism in the study. For example, why certain stakeholders impose more pressure on a company's environmental strategy?

6.7.1 Quantitative Research

Quantitative research methodologies make use of questionnaires and statistical analyses in order to establish underlying patterns and commonalities between surveyed groups to improve understanding of variable relationships (Robson, 2002). The quantitative data for this research were formulated through a face-to-face interview utilizing a structured questionnaire. The researcher himself administered the survey.

Quantitative data analysis supports the central aim of the research model, which is to establish whether a relationship exists between selected independent variables and dependent variables. Based on the literature review on corporate environmental management, as well as the background information of the MPOI, provided in previous chapters, seven testable hypotheses have been developed for the study. Both a null hypothesis (H_a) and its alternative (H_b) has been developed for each:

Hypothesis 1

H1a There is no significant difference of regulatory pressure among environmental strategies.

H1b There is a significant difference of regulatory pressure among environmental strategies.

Hypothesis 2

H2a There is no significant difference of primary stakeholder pressure among environmental strategies.

H2b There is a significant difference of primary stakeholder pressure among environmental strategies.

Hypothesis 3

H3a There is no significant difference of secondary stakeholder pressure among environmental strategies.

H3b There is a significant difference of secondary stakeholder pressure among environmental strategies.

Hypothesis 4

H4a There is no significant difference of environmental effectiveness among environmental strategies.

H4b There is a significant difference of environmental effectiveness among environmental strategies.

Hypothesis 5

H5a There is no significant difference of competitive advantage among environmental strategies.

H5b There is a significant difference of competitive advantage among environmental strategies.

Hypothesis 6

H6a Company's size does not affect the correlation between stakeholders' pressure and environmental strategies adopts by surveyed companies

H6b Company's size affects the correlation between stakeholders' pressure and environmental strategies adopts by surveyed companies

Hypothesis 7

H7a Company's resource availability does not affect the correlation between stakeholders' pressure and environmental strategies adopted by surveyed companies

H7b Company's resource availability affects the correlation between stakeholders' pressure and environmental strategies adopted by surveyed companies

Statistical tests aim to establish the probability of a specific event occurring from a set of possible events, expressed as proportion. If the probability distribution of p-value of a test is small, less than the significant level at 0.05, this would be used as evidence against H_a (null hypothesis). Rejection of H_a means accepting the alternative hypothesis (H_b). On the contrary, if the p-value is larger than the significant levels of 0.05, H_0 fails to be rejected, on the basis that insufficient evidence has been recorded to justify the claim of significance (Hinton, 1995).

Given the fluency of managers of Malaysian palm oil companies and representatives of the environmental stakeholder groups in both written and spoken English, the research questionnaire is formulated in English. A single version of the questions benefits the study by providing uniformity, rather than risking problems with a translation into the national language. Most of these managers and stakeholders' representatives have an English educational background and a higher degree from a university; many of them graduated from English speaking countries such as the US, UK, Australia and New Zealand. In fact English is the primary language for communication in the business sector in Malaysia. A sufficient command of English is also essential for those stakeholders who are professionals in their jobs.

The latest version of the Statistical Package for Social Science (SPSS), Version 14, was used to conduct all data analysis as well as hypothesis testing. Various statistical tests were performed on the data. Statistical techniques involved in this study were: data descriptives - mean, mode, median and standard deviation; a test of normality; reliability testing (Cronbach's Alpha); and cluster analysis. Meanwhile, five of the hypotheses (1 to 5) of the study were tested using non-parametric median test, and the other two hypotheses (6 and 7) were tested using partial correlation analysis

6.7.1.1 Questionnaire design and development

The research questionnaire contained 88 questions in all, which were structured in 6 sections (See Appendix A). The first section (Section A) of the questionnaire asked for general information about the firm and participant profile. In the former, among questions were: number of employees, years of establishment, total area of oil palms, number of palm oil mills, refineries and oleo chemical plants. The latter part asked

participants' highest educational level, job title, years that participants have held their current position, and how long he or she had been working for the company.

Section B related to the company's resources. A seven-point scale (ranging from 1 = scarce to 7 = abundant) was used to measure company's situation in terms of:: (i) financial resources, (ii) physical resources (e.g. equipment), (iii) human resources, (iv) organisational resources (e.g. having well-established quality control systems and cash management systems), (v) technological resources (e.g. unique technologies to produce quality products), and (vi) company's reputation. These six major categories of resources were adopted based on a study by Grant (1991) on companies' resources.

Section C measured the managers' perception of the pressure of stakeholders on their companies to improve their environmental performance. Using a scale of '1 = no pressure at all to 7 = a great deal of pressure' respondents were asked to measure to what extent 14 identified stakeholders within the industry exerted influence on, or exercised power over, their organisation to be more environmentally responsible. Various stakeholders in this subscale were: shareholders, financial institutions, insurance companies, regulators, local communities, employees, media, customers, competitors, suppliers, distributors, ENGOs, and the MPOA and MPOB.

The following section of the questionnaire, Section D, measured the company's environmental strategies. This section was divided into three subscales: operational level, tactical level, and strategic level. Items in this section were adapted from those used in the studies examined in the extensive literature (Banerjee, 2001; Petulla 1987; Hunt and Auster 1990; Roome, 1992; Welford and Dodge 1995; Byrne and Kavanagh 1996; Hart 1997; Tilley 1999; Henriques and Sadorky, 1999; and Buysse and Verbeke) on corporate environmental strategies.

(i) *Operational practices*. There were four groups of activities under this category:

- Waste reduction - encompassing a number of practices involved in the reduction of material waste, recycling, substitution of less hazardous alternatives, consumption of waste internally, and finding a market for waste materials;

- resource reduction - involving the conservation of water and energy, reduction of packaging, and the spreading of risk by utilising third-party providers of specialised environmental services;
- resource allocation - relating to money spent on environmental initiatives such as research and development, new agricultural practices, setting a cost on environmental programmes; and
- marketing strategies - creating a market for by-products, adopting marketing strategies related to environmental management, such as developing a good image in terms of environment.

Statements about all items in these subscales were positively worded except for **item c** (Reuse of waste material is not highly practised in our organisation) and **item r** (Little application of marketing strategies related to environmental management).

(ii) *Tactical practices*. Four types of tactical practices were:

- supply chain management - setting environmental standards for suppliers, early supplier involvement, and environmental audits of suppliers;
- design and development - involving environmental design, product development, risk analysis, life cycle analysis (LCA), environmental management system (EMS);
- engagement with stakeholders - consulting stakeholders and engaging stakeholders in environmental activities; and
- publication of environmental management – publishing environmental management policies, and practices among others to employees and other stakeholders.

Statements about all items in these subscales were positively worded except for **item e** (Little attempt is made to evaluate the whole life of our product pertaining to the environment) and **item i** (Little effort taken by our organisation to include stakeholder consultation in environmental management).

(iii) *Strategic practices*. Strategic practices specified how an organisation would utilise environmental strategies to compete, and how these practices would be implemented

and sustained. These were typically a set of objectives, plans and policies established by top managers such as executive officers. Strategic practices comprised environmental policies, programmes and environmental awareness, and long-term business strategies. These strategies were:

- policies and programmes involved in having an environmental corporate policy, employee training programmes, long-term planning horizons, mission statements, and the presence of an environmental department;
- environmental awareness practices, include strategic environmental alliances and surveillance of the marketplace for environmental information; and
- involvement of top management in environmental management.

Statements about all items in these subscales were positively worded except for **item a** (In general members of the board of director do not concern of our environmental performance), **item g** (Top management level shows little involvement in environmental management in the organisation) and **item k** (Only high level staff involve in environmental training at our organisation). Using the scale '1 = strongly disagree to 7 = strongly agree', participants were asked how strongly they agreed or disagreed with the above-mentioned statements.

Section E measured the effectiveness of the company's environmental strategies. Using scale '1 = strongly disagree to 7 = strongly agree', participants were asked to rate how strongly they agreed or disagreed with eight statements. These statements were related to environmental compliance, level of investment in new technology, operational costs, level of complaints, environmental accidents, environmental management systems, relationship with stakeholders, and public environmental disclosure (Fiksel 1994; Judge and Douglas 1998; and Welford and Gouldson, 1993).

Section F, the last section of the questionnaire; measured what competitive advantage managers perceived as a result of their company's environmental strategies. Using a scale '1 = No result in competitive advantage (CA) to 7 = Result in competitive advantage' participants were asked to rate their company's competitive advantages as a result of current environmental strategies. Altogether, there were nine items in these subscales. These items were related to insurance premiums, finance, community relations, staff commitment, product quality, materials efficiency, pressure groups

relations (e.g. ENGOs), media coverage, and present and future environmental compliance. All these items were adopted from Welford and Gouldson (1993 p.11).

It is important to bear in mind that this study used managers' evaluations and not actual behaviour. Research of the kind undertaken here could be based in either 'archival' (also known as objective) measurement, or 'perceptual' measurement. Archival measurement is steeped in the idea that 'accurate' research must use 'objective' measurement techniques to prove accuracy (Starbuck & Mezias, 1996). Alternatively, with perceptual measurement the point is not to assume that there are necessarily 'objective' or 'accurate' measures of performance, but rather to elicit the perceptions of senior managers. Due to their knowledge of their organisations it is possible that managers would give a more positive picture of the company's own behaviour and competitive position than is the case in reality. Moreover, use of managers' perception instead of real data was justified due to the scarcity of information on environmental data in the MPOI; where such information is available, it is not straightforward for a company to release it as it is considered private and confidential. In relation to this, a number of commentators argued that the way in which managers perceive the environment is more critical to company strategy than is archival measurement of the environment (Hambrick & Snow, 1977; Miller, 1988). This idea has been extended by Hambrick and Mason (1984), who argued that organizational outcomes can be viewed as reflections of the values and cognitive bases of a coalition of top managers. It has also been suggested that perceptual measures are more appropriate than archival measures when individuals are the unit of analysis, and when research interest is focused on relatively recent events (Boyd, Dess, & Rasheed, 1993). For these reasons, the research study described here measured the impact of voluntary environmental instruments by analysing the perceptions of senior managers.

6.7.1.2 Data Analysis

Once all the information was gathered from questionnaires, data were transferred into the SPSS programme. Data cleaning was first conducted to check for errors made while keying in the data.

6.7.1.3 Coding and Data Cleaning

The surveyed data of thirty six individuals from the nine companies whose locations scattered across Malaysia (West and East Malaysia), were collected over five months, from mid April to mid August 2006. After the field work, the questionnaires were numbered and manually coded in SPSS for Windows, Version 14, according to Appendix A. The data were then checked and corrected for coding and computer data entry errors. They were carefully examined and explored to understand the data and a potential relationship and differences among variables in the study.

6.7.1.4 Recode Negative to Positive Statements and Missing values

Prior to any analysis, negative statements from related variables were recoded as positive statements. This involved seven items in Section D - Environmental Strategies. Items involved in the recode were: 5(i) c and r, 5(ii) e and i, 5(iii) a, g and k. All other items that were positively stated were not subject to the transformation. Items that were not answered by respondents were considered as a missing value and given the value 99.

6.7.1.5 Tests for Parametric or Non-parametric Data

The major choice of statistical methods is dependent on whether the data is parametric and non-parametric. The data must meet two conditions in order to use the parametric analysis of variance: firstly, each of the group must be a random sample from a normal population, secondly, in the population, the variance in all groups must be equal (Emory & Cooper, 1991). These two conditions can be satisfied by the test of normality and equal variance. A common test for normality, the *Kolmogorov-Smirnov* test, was used for this purpose, and all the surveyed companies' research variables were tested to determine whether parametric or non-parametric analysis was appropriate in this study.

6.7.1.6 Reliability and Validity of Research Questionnaire

Due care was taken in developing all of the measuring instruments. Reliability is a measure of the internal consistency of a set of scale items. In this study each section was

subject to a reliability analysis test. The *Cronbach's Alpha* was used to measure reliability of each construct or subscale in the instrument. Cronbach's Alpha can take values between 0 to 1. The closer to 1, the more reliable the scale. A Cronbach's Alpha level of 0.7 and above, as proposed by Nunnally (1978), was used in this study to confirm a construct's reliability. Additionally, the influence of each of the items individually was investigated. For this purpose, a *Corrected Item-Total Correlation* analysis provided suggestions for the removal of an item or some items from the subscales. Such a practice would increase the value of Alpha (reliability of the questionnaire). However, to do this would also depend on intuition of the researcher.

6.7.1.7 Descriptive Statistics

Once a data set was entered into SPSS software, exploratory data analysis was conducted to explore the data. Simple data descriptives such as frequency, means, median and standard deviation, skewness and kurtosis (distribution) analysis provided general information to the researcher about the feeling of the research data, before embarking on other high level statistical techniques.

6.7.1.8 Cluster Analysis

According to Minichello, Aroni, Timewell and Alexander (1995 p.266), typologising is a method that researchers commonly use by which ideas can be grouped in order to understand phenomena being studied more completely. In other words, it is a method of making sense of abstract ideas. In a quantitative analysis the typologies of environmental strategies' proactiveness were based on a cluster analysis. The forty items measuring environmental strategies (Section D of the questionnaire) were subsequently subjected to a cluster analysis in SPSS (that is 19 operational level items, 10 technical level items, and 11 strategic level items). The *Hierarchical Cluster* procedure was chosen for purpose, as it is appropriate for data sets containing less than two hundred cases. Another procedure available in SPSS is the *K-Means Cluster*, which is appropriate for large samples (Francis, 2004 p.149). The identification of numbers of stages in the typologies of environmental strategies in the MPOI was made through this cluster analysis procedure. Using the Hierarchical Cluster procedure, this analysis will consider three- to five-strategy, according to the various typologies identified in the

literature. The minimum numbers of strategy stages in a typology was three and the maximum was five, but most researchers identified four-stage typologies. However, different criteria were used to select the best number of groups.

The number of environmental strategies groups in this procedure will be determined using *Ward's Method*. Alternatively, *Z-scores* can be used to standardise variables. In SPSS there are a number of methods for calculating the distance between two cases. In this analysis the researcher chose the *Euclidean distance method*. The *Cluster Membership table* showed a cluster membership for a determined numbers of cluster solutions. To determine what is the best number of clusters of environmental strategy proactiveness of companies, significant differences of these variables across the clusters in the three-cluster solutions, four-cluster solutions and five-cluster solutions were examined by non-parametric *Median Test*.

6.7.1.9 Hypothesis Testing

Of the study's seven hypotheses, five hypotheses (1 to 5) were tested by the use of a non-parametric Median Test. All analyses were conducted by means of SPSS version 14 for Windows. Meanwhile, for hypotheses 4 and 5, which respectively measure the effect of company size (plantation area and number of employees) and resources on the relationship between stakeholders' pressure and overall environmental strategies, the researcher used a *partial correlation analysis*. For each test, a level of 0.05 was set for significance.

6.7.2 Qualitative Research

Unlike a survey in a quantitative study, interviewing is one of the most important sources of case study information (Yin, 2003 p.89). One of the main objectives of the qualitative study is to identify the gap between information gathered from quantitative data and the research questions. In addition, the semi-structured interview in this case is used to substantiate and augment evidence from the survey (quantitative data) in three ways. First, the interview expands and enriches the meaning derived from quantitative methods. Second, if the survey evidence is contradictory rather than corroborating, the researcher can pursue the problem by inquiring further into the topic in order, for

example, to validate categorisation of surveyed companies' environmental proactiveness. Third, the researcher can make inferences from interviews; for example, if different views are given by key people in an organisation, the researcher may find new questions about communication and networking within an organization. However, it should be borne in mind that these inferences should be treated as clues worthy of further investigation rather than as definitive findings.

In order get a balance and rounded view of stakeholders influence on the industry in matters pertaining to corporate environmentalism and how the industry responds to these stakeholder pressures, 13 interviews were conducted with individuals from various palm oil industry stakeholders. Among stakeholders involved in these interviews were ENGOs, the DOE, MPOA, a law firm and the media. The selection of individual stakeholders was based on their interactions with, and knowledge of the industry, especially in terms of issues pertaining to environmental management in the industry. Individuals who were interviewed from each organisation were well-known figures or those in a senior position in their organisations. The interview questions in the interview protocol (Appendix B) were open-ended questions. Among questions asked by the researcher were: the interviewee's position in the organisation, how long they had been working for their organisation, the nature of their job, and how they perceived the effect of the palm oil industry on the environment. The crux of the interview was related to questions pertaining to their organisation's power against the MPOI, how their organisation exerted pressure on the industry to be more environmentally responsible in their activities, and how the MPOI reacted to their pressure. A further question which ensued was: what problems they face in pressuring the industry to be more environmentally conscious. In addition, their opinions concerning the strength of their pressure in the future were also discussed. Interviews with stakeholders would provide a rounded view of the impacts of stakeholders' pressure on the industry rather than a one-sided view from the industry's players. Views from stakeholders would validate information given by industrial players during the interviews.

In order to improve the accuracy of the data collected in the semi-structured interviews, each interview was tape-recorded subject to gaining the permission of interviewees. In many occasions during the interviews, the tape recorder was turned off at their requests when they wanted to speak 'off the record'. Once an interview was completed the taped

interview was transcribed onto a word processor; by doing so the researcher gained more insights into the topic of study, and was provided with new ideas for the subsequent interviews. Once transcribed and checked for any errors, transcripts of interviews were sent to the respective interviewees either through ordinary (postal) mail or email, depending on the means preferred by interviewees. By doing so the interviewees could then make alterations to the data and send it back to the researcher. There were a couple of reasons for this procedure. First, it improved the accuracy of the data. By reading through the response the interviewees had the opportunity to censor anything they did not wish to be included. Second, it allowed them to reconsider their responses and make any necessary alterations. For example, questions may have been misheard or misunderstood during an interview. Out of the 32 transcripts of palm oil company representatives' interviews, only 8 interviewees (or 25 percent) sent back transcripts, and out of 13 interviews with palm oil companies' stakeholders, only 5 (or 39 percent) sent back the transcripts. All those who sent back the transcripts only made minor alterations. The researcher then amended the transcription of the interview accordingly. If no feedback is received from the interviewees, the researcher assumed no comments and used the existing transcripts for further analysis.

6.7.2.1 Reliability and Validity of Qualitative Research

Qualitative research involves sustained interaction with the organisation being studied. In other words qualitative research entails close contact of the researcher with the objects (respondents) of study. As with quantitative research, in this study the objectivity of qualitative research was evaluated in terms of reliability and validity of its observations (Kirk & Miller, 1986).

To ensure reliability and validity of the study the four common tests of objectivity as proposed by Yin (2003 p.34) were completed. The first test was *construction validity*, which required research to establish the correct operational measures for the concepts being studied. According to Yin (2003 p.35) in a case study there were three tactics available to increase construct validity. The first was the use of multiple sources of evidence, in a manner encouraging convergent lines of inquiry. This is achieved in the data collection stage by asking different respondents similar questions. In this study each palm oil company was represented by four managers from various units. In

general, the researcher asked common questions to interviewees, however, specific questions were also asked to get more details regarding the area of expertise of interviewees. At the same time other organisational information, such as firms' newsletters, procedures, environmental reports, training materials, and annual reports were also gathered and reviewed. In addition, evidence available externally to the organisation was also sourced. This included government reports, other academic studies and media reports. A second tactic was to establish a chain of evidence. This tactic related to the first tactic, where each piece of evidence was investigated to see if all information converged to the same evidence. The third tactic was to have the draft case study reports reviewed by key informants. In this research, the researcher asked a number of the participants to review the draft case study as a validating procedure. Reviewing of the draft by the participants ensures the actual facts of the case have been presented, even though the informants may still disagree with an investigator's conclusion and interpretation. If informant disagreement arises during the review process, an investigator knows the case study report is not yet finished and such disagreements should be settled through correction of the draft.

The second test was *internal validity*. The internal validity was achieved through pattern matching and explanation building. Pattern matching was achieved by matching respondents' statements into groups of related internal and external factors. The explanation building identified voids in current information that could be gleaned from future interviews. Internal validity is improved if the case includes a time series analysis. However, since this research was a snapshot and cross-sectional analysis, because of time feasibility limitations and dearth of available information, this research suffers internal validity limitations.

The third test is *external validity*. External validity would require replication of this case logic in multiple-case studies. For this study only 9 companies out of 36 companies agreed to participate in the research. Since such a small percentage (25 percent) of palm oil companies participated - i.e. less than 50 percent of the population - this case study cannot deal with the issue of external validity. Thus these research findings would have limited specific generalisation ability. However, unlike survey research, which relies on statistical generalization, case studies rely on analytical generalization. In analytical generalization, the investigator is striving to generalize a particular set of results to some

broader theory (Yin, 1994 p.37). In relation to this, the knowledge gained from this case study will significantly assist the researcher in understanding how stakeholders' pressures influence the MPOI's environmental strategy, and, how effectiveness and competitiveness is achieved from any particular strategy taken by these surveyed companies.

Finally, *reliability* is necessary to ensure that a further researcher can replicate this study. This is achieved by establishing the case *modus operandi*. A research protocol, which consisted of a semi-structured standard set of questions, was developed to satisfy the proposition, taping all interviews when possible, transcribing the interview verbatim and coding the interviews and testing by independent judges to test accuracy of coding. As the researcher himself was the instrument in the study's qualitative research, the reliability and validity were therefore largely reliant on the skill and experience of the researcher (Patton, 2002).

6.7.2.2 Data Preparation for Analysis

Miles and Huberman (1994) have described qualitative data analysis as an iterative and interactive process; that is, open and flexible. The interactive model of data analysis has three sub-processes; data reduction, data display and conclusions. In the data reduction sub-process, data is selected and condensed. This involves codifying or labelling of the data. Data display involves the organisation and compression of data into a framework that enables conclusions to be drawn or action to be taken. The displaying of data is the method chosen to present the data. There are various display techniques to choose from including: network diagrams (Knoke & Kuklinski, 1982); rich-pictures (Checkland & Scoles, 1990) and maps and matrices (Dey, 1993).

The process could also be presented as a series of steps, as described in the following:

a) Transcribe interview data

Data from the tape recorder were transcribed onto a word processor. All transcribed interview data then were sent back to the interviewees of respective Malaysian Palm oil companies and their stakeholders for approval, and those who returned the interviews'

transcripts with alterations were changed accordingly. At this point data were ready for the subsequent process.

b) Code/label data

The data were reduced, by breaking them down into manageable units of codes and labels. In this research coding and labelling data were based on content analysis methods of data interpretation.

A content analysis is the systematic analysis of written and oral information to build generalisations (Brislin, 1980). The content analysis was used for identifying, coding and categorising the primary patterns in the data (Patton, 1990 p.381). All coding was undertaken while simultaneously listening to the taped interviews and reading from transcripts. Free codes were used in the initial stages and these were further processed into coding trees when patterns emerged (Miles & Huberman, 1994). The nodes for coding the data were structured around a set of themes pertaining to corporate environmental management. The descriptive and analysis codes were generally clustered into four major categories: stakeholder pressures, level of environmental strategy, environmental effectiveness and competitive advantage. The first two categories then were divided into subcategories: an organisation's stakeholders' pressure was divided into regulatory, primary and secondary; the environmental strategy category was broken down into operational, tactical and strategic level. As with quantitative data, in the qualitative study, a typology of environmental strategies was developed from those three levels of strategy. The purpose of typology construction in qualitative research is not only to clarify and summarise large volumes of data, but also to validate the stages of palm oil companies' strategies under the quantitative typology.

There are a number of computer assisted qualitative data analysis software (CAQDAS) packages available - QSR NUD*IST (N6), Ethnograph and QSR NVivo. In this study, QSR NVivo 7, the latest version of NVivo package, was employed for this qualitative analysis. The software facilitated the researcher's qualitative analysis in a number of ways. First, the software made importing interview transcripts a relatively easy exercise, as the researcher could import Word files saved in Rich Text Format (RTF). Second, the software made it possible to assign 'attributes' to each interviewee's status, such as being a palm oil company employee or palm oil industry stakeholder; also demographic

data of interviewees such as participant's company, job, years of work, levels of proactiveness of participant's company. These features were helpful in searching, coding and retrieval of data from the files in the database. By using NVivo software, tedious and time-consuming manual methods of data preparation, management and retrieval - all integral parts of data analysis - were avoided. Third, the software helped in the coding exercise. The codes were saved within NVivo database as 'nodes' that could then be reordered, duplicated, merged or removed, to help visualise and locate analytical items or categories. In this analysis, a further benefit was the ability to display the data graphically in NVivo. This involved using options like the 'modeller' and the 'search tool'. The modeller helps in creation, labelling and layering of connections made between ideas and concepts, while the search tool enables a variety of searches of the data and coding. Both tools are useful for prompting questions of any relationships, explanations or theories, and whether conducting further coding or data management is required. It also enables some search 'results' to be displayed in matrix form.

Although this software facilitated data analysis, it is crucial to remember that NVivo did not eliminate the need for the researcher to think. Developing valid and reliable coding categories relies on familiarity of the researcher with the research data**.** The researcher became familiar with the data as he went through the process of reviewing tapes, reading transcripts, coding development and subsequent trials. It has been argued that this process may be the most important initial requirement to developing an objective, valid and reliable coding system (Holsti, 1969).

c) Data Presentation

Data that has been broken down into units and categories needs to be presented in meaningful ways. As mentioned in previous section, there are three ways of doing so: network diagrams (Knoke & Kuklinski, 1982); rich-pictures (Checkland & Scoles, 1990) and maps and matrices (Dey, 1993). In this study, the findings of the data analysis used network diagrams, where relationships between variables were graphically displayed.

d) Interpretation and conclusions

In this research data interpretations will be based on content analysis and research is completed by a number of conclusions that were drawn from the research findings.

6.7.3 Comparison and Integration of Quantitative and Qualitative Data.

Data comparison involves comparing data from the quantitative and qualitative data sources to see whether there are any similarities and differences between the methods. Plausible reasons for any differences will be given. This is followed by data integration whereby both quantitative and qualitative data are integrated into a coherent whole.

6.8 Summary

This chapter outlined the research problem, questions, objectives as well as research methodology. Based on the research questions this chapter outlined why a triangulation or a mixed-methods research approach was deemed appropriate for the study. This study used multiple case studies of the MPOI. Only private companies listed on the KLSE were used as case studies. In order to gain a rounded view of the research questions a number of stakeholders of the industry were also included in the study.

In this chapter details of research methods of both quantitative and qualitative approaches were also included. In terms of the quantitative research, this chapter outlined research hypotheses, questionnaire design and development, data analysis, test of parametric and non-parametric data, reliability and validity of the research questionnaire, data descriptives, cluster analysis and hypotheses testing. In relation to qualitative research the chapter outlined reliability and validity of the data, as well as data preparation and analysis that involved interview data transcription, coding, presentation, as well as interpretations and conclusion. Once both forms of data were interpreted, they needed to be compared and integrated into a coherent whole to answer the research questions, which is also outlined in the chapter.

Chapter Seven will apply and present the findings of the quantitative analysis, and Chapter Eight will present the qualitative data analysis.

Chapter Seven

Quantitative Analysis and Hypotheses Testing

7.1 Introduction.

This chapter reports the findings of quantitative research methodology. It begins with a brief description of company participants followed by descriptive statistics of individual participants against the research's variables, test of normality, reliability analysis, and analysis of research variables (company's resources, stakeholders' pressure, environmental strategies, environmental effectiveness and competitive advantages) against surveyed companies. How the environmental strategies' proactiveness will be categorised is also discussed. A further analysis looks at how the research variables differed from one another in relation to various environmental strategies' proactiveness. At the end of this chapter, the research hypotheses will be tested, followed by a discussion of the limitations of quantitative analysis.

7.2 The background of Responding Companies and Individuals

7.2.1 Responding Companies

Altogether nine palm oil companies listed in the KLSE were involved in this survey. All companies were GLCs that were linked either to the federal or state governments of Malaysia. In order to disguise the surveyed companies they were given alphabetical designations - A to I. Table 7.1 shows details of the surveyed companies' backgrounds.

In terms of year of establishment, the history of these companies varied from one another; three companies (B, E and F) were established in the 1800s, having originated from colonial British companies and their early activities related to rubber. They then were nationalised by the Malaysian government as Malaysian companies under its nationalisation programme which was aggressively undertaken in the 1980s. Company D was established in the 1930s, also from a British company whose core business was related to rubber, later in the 1970s a state economic development corporation (SEDC) became its major shareholder. Another four companies (C, G, H and I) were established by the federal government agencies and a state economic development corporation

(SEDC) between the 1960s and 1970s. Company A was the youngest company; it was established in early the 1990s by a SEDC in the Southern part of Peninsula of Malaysia.

Table 7.1: ***Participant Companies' Backgrounds***

Company	Year Established	% contribution of Palm oil activities to total revenue	No. of employees	Employees in palm oil business (Malaysia)	Total Planted Area in Malaysia (ha)	No. of Mills	Location of Oil palm plantation operation
A	1990s	95	640	610	25,000	1	Malaysia
B	1840s	80	25,335	23,611	147,369	24	Malaysia and Indonesia
C	1960s	70	3,600	3,270	35,000	2	Malaysia
D	1930s	65	4,597	3,774	64,512	7	Malaysia and PNG
E	1820s	40	12,000	9,969	85,000	10	Malaysia and Indonesia
F	1820s	73	18,543	10,567	100,098	14	Malaysia and Indonesia
G	1970s	95	2,500	2,400	15,471	3	Malaysia and Indonesia
H	1970s	55	10,676	7,666	75,355	4	Malaysia and Indonesia.
I	1970s	90	3112	2856	25,191	2	Malaysia

Source: Based on the sample survey (2006)

In terms of financial contribution of the palm oil industry activities against the total company's revenues, palm oil activities contributed 90 percent and more in three companies (A, G and I). In another three companies (B, C and H), the industry contributed between 70 and 90 percent of total revenues. Two companies (D & H) received between 50 percent and 60 percent of their revenues from the industry. Only in company E did the industry contribute less than 40 percent of the total company's revenue. Although the percentage of palm oil industry contribution in revenue against other business activities differed, the industry still a major business activity in all cases.

The total number of all employees, and number of employees involved in palm oil activities, in each company varied widely. Company B, with a total of 23,611 employees had the highest number, followed by company F and E who had 10,567 and 9,969 employees respectively. In another four companies (C, D, G, H) their employee numbers ranged between 2,000 and 8,000. Company A had the smallest number of employees by a considerable margin.

Company B had the largest oil palm plantation area in Malaysia, with close to 150,000 hectares of oil palms. Other big players were companies D, E, F and H, with planted areas between 65,000 to around 100,000 hectares. Except for company G, which had only 15,471 hectares of oil palms, the other companies - A, C, I had between 20,000 and 35,000 hectares of oil palm planted area. Using a membership classification of private plantation companies from the MPOA, a company is classified under category I, II or III if it has more than 40,000, between 5,000 and 40,000, and between 500 and 5,000 hectares of oil palms respectively. In this study, companies B, D, E, F and H fall under the first category and are classified as big companies, whereas company A, C, G and I fall under the second category and are classified as medium size companies. The variation of the size of planted area of oil palms of the surveyed companies represents the true population of the study, where companies under the KLSE in general can be classified as big and medium size company based on their oil palm planted areas.

Each surveyed company has its own palm oil mills. Company B was the largest, with 24 mills, this was followed by company F and E with 14 and 10 mills respectively. The remaining companies had less than 10 mills each. It is important to note here that unlike other companies, company B and company D are not only involved in upstream sector, but also in the downstream sector of the industry - company B has three refineries and six oleo chemicals factories, and company D has one refinery.

Six companies - B, D, E, F G and H - were considered as international companies, as they had expanded their businesses and established oil palm plantations overseas (companies B, E, F, G and H in Indonesia and company D in Papua New Guinea). Only three companies - A, C and I - operated their businesses solely in Malaysia.

7.2.2 Respondents' Profiles

Altogether thirty six participants from the palm oil companies were involved in the survey; each company was represented by 4 individuals[30] who held various management positions. Obtaining multiple responses from both higher and middle management levels, and from various job categories, provided perspectives of corporate

[30] Although a number of companies provided names of 5 individuals who were willing to participate in the study, the researcher only chose the 4 most accessible individuals.

environmentalism from different levels and functional areas within a company. Table 7.2 shows respondents' position, educational background, years in current position, and years working for their companies.

Table 7.2: ***Profiles of Respondents from Studied Companies***

Company	Participant	Current Position	Educational Background	Years in Current Position	Years in Company
A	1	Estate Manager	Degree	6	14
	2	Estate Manager	Degree	6	6
	3	Mill Manager	Degree	2	5
	4	General Manager	Degree	5	14
B	1	Plantations Director	Diploma	4	28
	2	Senior Estate Manager	Degree	1	21
	3	Mill Manager	Degree	10	16
	4	General Manager	Diploma	1	32
C	1	Estate Manager	Certificate	17	26
	2	Mill Manager	Degree	5	5
	3	Estate Manager	Diploma	12	16
	4	Assistant Mill Manager	Degree	3	3
D	1	General Manager	Degree	10	26
	2	Manager (Corporate)	Degree	2	11
	3	Environmental Officer	Master	1	1
	4	Estate Manager	Certificate	7	15
E	1	Visiting Agent *	Master	13	26
	2	Deputy Group Engineer	Certificate	10	25
	3	Mill Manager	Diploma	3	3
	4	Estate Manager	Degree	6	6
F	1	Mill Manager	Degree	4	11
	2	General Manager (Mills)	Degree	2	17
	3	General Manager (Mill operations)	Degree	10	15
	4	General Manager (controller)	Degree	12	22
G	1	Planting Advisor *	Diploma	10	25
	2	Senior General Manager	Degree	10	20
	3	Group Engineer	Degree	10	21
	4	Estate Manager	Master	4	23
H	1	Plantations Director	Degree	5	23
	2	Estate Manager	Diploma	2	15
	3	Estate Manager	Diploma	4	20
	4	Assistant Mill Manager	Degree	6	11
I	1	Process Engineer	Degree	5	14
	2	Senior Estate Manager	Master	1	12
	3	Regional Manager*	Degree	1	25
	4	Estate Manager	Degree	6	16

* Because of the same nature of the job, this position is categorised as general manager in SPSS analysis.
Source: Based on the sample survey (2006)

In addition, Table 7.3 shows other important characteristics of the respondents as a group. In terms of educational level, only 8.3 percent respondents were certificate holders, a majority had a first degree (52.8 %), followed by diploma holders (27.8 %) and those with a master degree (11.1%). The respondents hold various job titles, ranging from environmental officer, estate manager to plantation director. The three major groups of respondents were: general manager (25%), estate manager (27.8%) and mill managers (13.9%). These three groups made up almost 67 percent of all participants. If senior estate managers and assistant mill managers were added in these groups, these would constitute almost 80 percent of the respondents. Only one environmental officer was involved in the study.

Table 7.3: ***Characteristics of Respondents***

		Frequency	Percentage (%)
Educational Level	Certificates	3	8.3
	Diploma	10	27.8
	Bachelor	19	52.8
	Master	4	11.1
Job Title	Environmental Officer	1	2.8
	Estate Manager	10	27.8
	Senior Estate Manager	2	5.8
	Assistant Mill Manager	2	5.8
	Mill Manager	5	13.9
	Process Engineer	1	2.8
	Corporate Manager	1	2.8
	Deputy Group Engineer	1	2.8
	Group Engineer	2	5.6
	General Manager	9	25
	Plantation Director	2	5.8
Management layer	Operational and tactical	21	58.3
	Strategic	15	41.7
Years in current position	Less than 5	15	41.7
	5 to 10	17	47.1
	Above 10	4	11.2
Years in the company	Less than 5	3	8.3
	5 to 10	4	11.2
	11 to 16	13	38.8
	Above 17	16	41.7

Source: Based on the sample survey (2006)

In this study those who held a position as environmental officer, estate manager, senior estate manager, assistant mill manager, mill manager and process engineer were classified as being in operational and tactical managerial levels. Twenty one respondents (58.3 %) were in this classification, and the rest, fifteen respondents (41.7

%) who held a position as corporate manager, deputy group engineer, group engineer, general manager and plantation director, were classified in the strategic managerial level. The plantation director was the highest rank of respondent participating in this study – the two directors involved constituted 5.8 percent of total respondents.

In terms of years in current position, overwhelmingly, close to 90 percent of respondents had held their positions less than ten years. But, nonetheless in the plantation industry, years in current positions does not necessarily reflect the person's experience in, and knowledge about, the industry as many of these managers have transferred from one estate to another, and/ or been assigned to plantations in neighbouring countries. When they returned to Malaysia they may hold the same position and/or higher position in their companies. Perhaps this is better reflected in the total number of years respondents had worked for their companies. It is interesting to see more than 80 percent of participants had been working more than eleven years for their own companies, only 11.2 percent between five to ten years and 8.3 percent less than five years. So, a majority of participants were seen as experienced enough and sufficiently knowledgeable about the palm oil industry.

7.3 Descriptive Statistics - All Individual Respondents

In this section, all of the important variables were analysed in general to see how the respondents in all surveyed companies would perceive their companies' resources, stakeholders' pressure, environmental strategies, environmental effectiveness and competitive advantages. Such an analysis provides a general understanding of variables among participants across the companies. A cut-off point of four in the seven-point (1 to 7) scales was used to differentiate between low and high pressure from stakeholders, company's resources, environmental strategies, environmental effectiveness, and competitive advantage.

7.3.1 Company's Resources

Altogether, there were six items under the variable of company's resources. Descriptive statistics of the company resources variable are shown in Table 7.4. All respondents (N=36) answered the items in the variable. In the scale 1 (scarce) to 7 (abundant),

overwhelmingly, all respondents seemed to rate towards the high scale in regard to their company's possession of resources. The highest mean and mode were for company's reputation item - 6.28 and 7 respectively. Meanwhile, means of other resources were close to 6, except for technological resources, with its mean at 5.36. Among these resources, the two highest standard deviations were observed for financial resources (0.81) and technological resources (0.80) of which showed more deviation among respondents than other items. In contrast, organisational resources showed the lowest standard deviation, 0.62, indicates less deviation among respondents in their responses to the question. In general the differences among participants in this variable can be considered small, judging from variation being less than 1 in the 1 to 7 scale.

Table 7.4: ***Descriptive Statistics of Company's Resources***

Resources	Descriptive statistics								
	N	Mean	Median	Mode	Min.	Max.	Std. Dev.	Skewness	Kurtosis
Company's reputation	36	6.28	6.0	7	5	7	0.74	-0.51	-0.98
Organisational resources	36	5.81	6.0	6	4	7	0.62	-0.59	1.22
Financial resources	36	5.58	6.0	6	4	7	0.81	-0.11	-0.309
Physical resources	36	5.58	6.0	6	4	7	0.60	-0.34	-0.07
Human resources	36	5.56	6.0	6	4	7	0.69	-0.21	-0.01
Technological resources	36	5.36	5.5	6	4	7	0.80	-0.41	0.70

Source: Based on the sample survey (2006)

Among these resources, the two highest standard deviations were observed for financial resources (0.81) and technological resources (0.80) - showed more deviation among respondents than other items. In contrast, organisational resources showed the lowest standard deviation, 0.62, which indicates less deviation among respondents in their responses to the question. In general the differences among participants in this variable can be considered small, judging from variation being less than 1 in the 1 to 7 scale. Negative skewness of all resources items showed that participants seemed to choose the high end scale of the items. This was shown by skewness, where the highest skew and lowest skew related to the organisational resources item (-0.59) and the financial resources item (-0.11) respectively. In addition, negative and positive kurtosis showed two types of variation of the items. Negative kurtosis items such as financial resources

and company's reputation showed their distributions were widely spread. Positive kurtosis of organisational resources and company's reputation items indicated most answers from participants were closely clustered around the mode.

Overall, judging from all negative skewness values, and both positive and negative kurtosis, items under this variable, company's resources were considered as *not normally distributed*.

7.3.2 Stakeholders' Pressure

Descriptive statistics of stakeholder pressure are shown in Table 7.5. There were fourteen items under the variable. Except for items related to financial institution (N=35), insurance companies (N=35) and distributors (N=34), all items were answered by respondents (N=36). A typical reason for non-response was that the respondents did not have capacity to answer the questions, and left these items to be answered by top management positions.

Table 7.5: *Descriptive* Statistics *of Stakeholders' Pressures*

	Descriptive statistics								
Stakeholder Pressure	N	Mean	Median	Mode	Min	Max.	Std. Dev.	Skewness	Kurtosis
Environmental regulators	36	6.33	6.0	7	5	7	0.72	-0.60	-0.80
Competitors	36	4.42	5.0	5	1	7	1.70	-0.63	-0.71
Association	36	4.39	5.0	5	2	7	1.36	-0.33	-0.35
Palm Oil Board	36	4.36	5.0	5	2	7	1.27	-0.38	-0.37
Customers	36	4.00	4.0	5	1	7	0.57	-0.38	-0.64
ENGOs	36	3.97	4.5	5	1	7	1.73	-0.23	-0.73
Local communities	36	3.97	5.0	5	1	7	1.63	-0.41	-0.96
Media	36	3.89	4.0	5	1	7	1.67	-0.10	-0.63
Shareholders	36	3.89	4.0	5	2	6	0.24	-0.66	-1.00
Employees	36	3.78	4.0	5	1	6	0.59	-0.20	-1.20
Suppliers	36	3.31	3.0	2	1	6	0.39	0.16	-0.84
Distributors	34	3.15	3.0	3	1	6	0.42	0.06	-0.96
Financial institutions	35	2.54	2.0	2	1	6	1.04	1.55	2.21
Insurance companies	35	2.31	2.0	2	1	4	0.87	1.05	0.33

Source: Based on the sample survey (2006)

Among the fourteen stakeholders, overwhelmingly, the respondents perceived environmental regulators, especially the DOE, as the highest threat against their companies, as indicated by the highest mean, median and mode for this item: 6.33, 6, and 7 respectively. This was followed by competitors, the industry association, and the palm oil board with their respective means of 4.42, 4.39 and 4.36. A visual comparison shows a wide gap between environmental regulators pressure (the highest mean, 6.33) and these three items (competitors – mean 4.42, association - mean 4.39, and palm oil board – mean 4.36); a gap of close to 2 on a 1 to 7 scoring scale.

Taking a cut-off of 4, between high and low pressure, items such as industry association, palm oil board, competitors, media, customers, employees, local communities, shareholders and ENGOs would also be considered to exert pressure on the industry, though not as highly as government regulators. On the contrary, suppliers, distributors, financial institutions, and insurance companies were largely perceived as low pressure stakeholders. Among them, the two lowest stakeholders were financial institutions and insurance companies with their respective means of 2.54 and 2.31.

Negative skewness of all items in the stakeholder variable (except for suppliers, distributors, financial and insurance companies) showed respondents seemed to give high answers for the stakeholders' items. In other words, their answers were clustered at the high end of the scale. This was also observed for kurtosis, all items had negative value except for the financial institution and insurance company items. Positive and negative skewness and kurtosis of these items may indicate that they were *not normally distributed*.

7.3.3 Levels of Environmental Strategies

There were three levels of environmental strategies being investigated in this study namely operational, tactical and strategic. The definitions of these levels were outlined in the methodological chapter (section 6.7.1.1).

7.3.3.1 Operational Strategies

Table 7.6 shows descriptive statistics of operational strategies, comprising nineteen items in this variable. Unlike previous variables (resources and stakeholder's pressure)

not all respondents were qualified to answer all of the questions, because those respondents working at operational levels (palm mill and estate managers) could only answer questions relevant to their jobs. For example, mill managers could avoid answering questions related to agricultural practice in the palm oil estate, such as reduced usage of chemical and run-off. In contrast, estate managers would not be in a position answer questions pertaining to the mill operations, such as air emissions, mill effluent and new production processes.

All respondents (N=36) answered items related to water and electricity consumption, waste material, emergency preparedness, and putting a cost on environmental projects; but, the smallest response level (N=26) answered the items related to new production processes (e.g. oil extraction rate), cleaner mill effluent, and chemicals usage.

Among operational strategy items, respondents rated their companies highly on items related to reduced open burning, reduced run-off, emergency preparedness, reduced chemical usage, air emission control, cleaner mill effluent, and new agricultural techniques. Mean, median and mode of these items were varied between 6 to 7. These results came as no surprise, since most of these items (reduced open burning, emergency preparedness, air emission control and cleaner mill effluent) are compulsory environmental strategies that are dictated by various environmental regulations. These practices are exercised mainly in response to regulatory requirements, since the authorities periodically visit these palm oil companies for inspection.

Meanwhile, the other highly rated items of reduced chemicals usage, controlled run-off, new agricultural techniques, and introduction of new production process to increase efficiency in OER, have all become standard practices of the industry in Malaysia. These practices are of paramount importance because they could significantly affect productivity of oil palms and production of palm oil. Again, high practice of these items was expected because they are economically motivated. Other items, which were moderately exercised (means between 4.5 to 6) related to usage of waste materials, using environmentally friendly materials, reduced water, electricity, and fuel consumption, reduced impacts on flora and fauna, and putting a cost on environmental projects. Among the least common practices under this variable were incentive

programmes, R&D and creating markets for waste products - their means, median and mode concentrated on the middle scale of 4.

Table 7.6: ***Descriptive Statistics of Operational Environmental Strategies***

	Descriptive Statistics								
Operational Strategy	N	Mean	Median	Mode	Min	Max	Std. Dev.	Skewness	Kurtosis
Open burning reduced or nil	30	6.90	7	7	6	7	0.31	-2.81	6.31
Run-off reduction	28	6.46	6	6	6	7	0.51	0.15	-2.14
Emergency preparedness	36	6.36	7	7	4	7	0.80	-1.12	0.75
Chemicals usage reduced	26	6.27	6	6	4	7	0.67	-1.24	4.11
Air emissions controlled/reduced	30	6.17	6	6	5	7	0.75	-0.29	-1.10
Cleaner mill effluent	26	5.96	6	6	5	7	0.66	0.04	-0.50
New agricultural techniques	30	5.96	6	6	5	7	0.67	0.04	-0.59
New production processes in mills	26	5.77	6	6	4	7	0.86	-0.32	-0.32
Fuel consumption reduced	30	5.70	6	6	4	7	0.74	-0.07	-0.18
Water consumption reduced	36	5.69	6	6	4	7	0.71	-0.49	0.43
Putting cost on environmental projects	36	5.44	5	5	4	7	0.84	0.18	-0.42
Reduced electricity consumption	36	5.53	6	6	4	7	0.81	-0.27	-0.31
Reduced impact on flora and fauna	29	5.38	5	5	1	7	1.21	-1.46	5.20
Waste material usage	36	4.69	5	5	4	7	1.88	-0.62	-0.70
Environmentally friendly material	35	4.63	5	5	1	7	1.50	-0.71	0.16
R & D	35	3.97	4	2	1	7	1.87	-0.07	-1.37
Marketing strategies	33	3.97	4	3	1	7	1.57	0.16	-0.28
Employee incentive programmes	35	3.60	3	3	1	7	1.54	0.47	0.10
Market waste product	35	2.71	2	2	1	7	1.38	1.33	2.08

Source: Based on the sample survey (2006)

Studying respondents' answers, overall, it is true to say surveyed companies are more likely to pay attention to operational strategies related in one way or another to environmental regulations and economic efficiency. In contrast, items related to the environment *per se,* such as impact on flora and fauna, incentives to reward employees' ideas, R&D, and creating a market for waste, were given a scant attention.

Comparing individual items in the variable, there were some differences among participants' answers. The two highest standard deviations were for the usage of waste material (std.dev.= 1.88) and R&D (std.dev.= 1.87), which showed the highest variation in the respondents' responses of all of the items practised by the surveyed companies. This was in contrast with the reduced open burning item; its low standard deviation (0.31) showed respondents' answers were concentrated. Put differently, it shows this strategy is widely practised by surveyed companies, since it is compulsory according to environmental law and failure to do so subjects the company to heavy punishment - up to half a million Ringgit Malaysia (US$ 131,780).

The positive and negative skewness and kurtosis of the items in this variable, operational environmental strategies, showed they were *not symmetrical*. Overwhelming negative skewness of most items showed respondents' answers were clustered at the high end of the scale. Additionally, high kurtosis of some items – marketing waste, reduced open burning, reduced chemical usage, and reduced impact on flora and fauna - showed these items were more clustered.

7.3.3.2 Tactical Strategies

Descriptive statistics of tactical strategies are shown in Table 7.7. There were ten items under this variable in which all respondents (N=36) answered the questions. The highest scoring practice is the item related to companies' undertaking EMS projects (mean 4.81), followed by the active role in environmental management in the industry, and setting environmental standard for suppliers/contractors items - with their means 4.72 and 4.50 respectively. Meanwhile, means for the rest of the items concentrated around four, with the lowest mean recorded for the practice of suppliers being audited (mean 3.64, median 3.5 and mode 3). This shows that the surveyed companies give less attention to the auditing of their suppliers' environmental management. What seemed to matter for respondents of all companies was to get the job done at the lowest cost, and in so doing suppliers' environmental performance was given less attention.

In terms of deviation among items, the highest standard deviation of 2.0 was observed for EMS projects and stakeholders receiving company environmental publications. A standard deviation of 2.0, on a 7-point scale, showed high variation in responses among

participants in terms of these items. On the contrary, the lowest variation is observed for the item of companies' sourcing decisions being based on suppliers' environmental dimensions (std.dev.= 1.16). Unlike the items in the operational environmental strategies variable, overall, the tactical environmental strategies items showed less skewness and kurtosis. This showed their data is *relatively more symmetrical*.

Table 7.7: ***Descriptive Statistics of Tactical Environmental Strategies***

	Descriptive Statistics								
Tactical Strategy	N	Mean	Median	Mode	Min	Max	Std. Dev	Skewness	Kurtosis
Undertake EMS projects	36	4.81	5	6	1	7	2.00	-0.88	-0.38
Active role in industry (e.g. RSPO)	36	4.72	5	6	1	7	1.97	-0.52	-0.95
Environmental standards set for supplies/contractors	36	4.50	5	5	2	7	1.36	-0.36	-0.46
Employees receive company environmental publications	36	4.14	4.5	5	1	7	1.55	-0.34	-0.45
Product life cycle evaluation	36	4.11	4	3	1	7	1.58	0.13	-0.73
Stakeholders receive company environmental publications	36	4.00	4	2	1	7	2.00	0.11	-1.30
Stakeholder consultation	36	3.97	4	5	1	7	1.70	0.05	-0.91
Involved in stakeholder projects	36	3.83	4	5	1	7	1.70	-0.17	-0.85
Sourcing decisions about suppliers	36	3.83	4	3	2	7	1.16	0.46	0.26
Suppliers audited	36	3.64	3.5	3	1	7	1.29	0.48	0.31

Source: Based on the sample survey (2006)

7.3.3.3 Strategic Strategies

Descriptive statistics of strategic strategy level are shown in Table 7.8. There were eleven items in this variable. Like the tactical strategy variable, all respondents answered the items (N=36). The highest mean was long term environmental business strategy (5.75); this was followed by the items: written environmental policy, environmental objectives, board of directors concern, someone responsible for the company's environmental management, top management involvement, environmental committee influence, upper level staff training, overall staff training, and written

mission statement, all with a mean of 5 or close to it. The lowest mean for the reported practices is for periodic company environmental audit - mean 4.44.

Table 7.8: ***Descriptive Statistics of Strategic Environmental Strategies***

	Descriptive Statistics								
Strategic Strategy	N	Mean	Median	Mode	Min	Max	Std. Dev	Skewness	Kurtosis
Long term environmental business strategy	36	5.75	6	5	4	7	0.91	0.05	-1.00
Written environmental Policy	36	5.44	6	5	1	7	1.48	-1.39	2.08
Environmental objectives	36	5.44	6	5	1	7	1.48	-1.39	2.08
Board of directors concern	36	5.25	6	7	1	7	1.75	-0.71	-0.60
Someone responsible for environmental management	36	5.14	5	5	1	7	1.85	-0.96	-0.30
Top management level involvement	36	5.14	5.5	7	2	7	1.66	-0.43	-1.17
Upper level staff has environmental training	36	5.06	5	5	1	7	1.45	-0.75	0.60
Environmental committee influence on company	36	5.00	5	5	2	7	1.26	-0.45	-0.15
Staff training for all in environmental management	36	4.97	5	5	2	7	1.32	-0.34	-0.35
Written environmental mission statement	36	4.83	5	5	1	7	1.68	-0.68	-0.12
Periodic company environmental audit	36	4.44	5	3	1	7	1.78	-0.08	-1.30

Source: Based on the sample survey (2006)

In terms of standard deviation among the items, the two highest standard deviations were items: 'someone responsible for environmental management' (1.85) and 'environmental audit' (1.78). A wider variation in respondents' answers was expected when the range of responses for these two items was six. The lowest standard deviation in this variable is for the item long term environmental business strategy (0.91). In general, as standard deviations were greater than one, the items in this variable showed some variations with one another.

All items (with the exception of long term business strategy) in this variable were negatively skewed, which shows that respondents seemed more likely to rate at the high end of the scale for most the items. As for kurtosis, in general, there were more negative kurtosis items, which showed items had a flatter distribution. Based on the

values of these two measurements, many items in the strategic environmental strategy variable were considered as *not symmetrical*.

7.3.4 Environmental Effectiveness

Descriptive statistics of environmental effectiveness measures are shown in Table 7.9. Altogether there were eight items under this variable. Except for environmental disclosure item (N=35), all respondents answered the items (N=36).. The highest item rating was for environmental law compliance (mean 6.64, median and mode 7). Overwhelmingly, all respondents rated high for this item. The item for reduced complaints, with its mean, median, and mode as 6.22, 6, and 6 respectively, closely followed this. Other measures with their means close to 6 were environmental accidents reduction, environmental system effectiveness, and investment in new technology. Lower values were observed for the items environmental activity disclosure and reduced operational cost, with their means 5.17 and 5.08 respectively. Comparing higher category items with lower category items, respondents seemed likely to perceive their environmental practices as more effective in terms of environmental compliance, rather than improving their environmental disclosure and reducing operational costs.

Table 7.9: ***Descriptive Statistics of Environmental Effectiveness***

	Descriptive Statistics								
Environmental Effectiveness	N	Mean	Median	Mode	Min	Max	Std. Dev.	Skewness	Kurtosis
Environmental law compliance	36	6.64	7	7	4	7	0.64	-2.29	7.0
Reduced complaints	36	6.22	6	6	4	7	0.72	-0.85	1.21
Environmental accidents reduced	36	5.89	6	6	4	7	0.71	-0.35	0.35
Environmental systems effective	36	5.75	6	6	5	7	0.65	0.29	-0.61
Stakeholder relationships good	36	5.67	6	6	4	7	0.79	-0.04	-0.36
Investment in new technology	36	5.53	6	6	3	7	0.77	-0.88	2.17
Environmental activity disclosure	35	5.17	5	5	2	7	1.12	-0.49	0.75
Reduced operational cost	36	5.08	5	6	2	7	1.30	-0.75	-0.21

Source: Based on the sample survey (2006)

7.3.5 Competitive Advantage

Descriptive statistics of competitive advantage are shown in Table 7.10. Of the nine items, except for insurance premium item (N=35), all respondents answered the questions. The highest value of competitive advantage variable was the assured present and future environmental compliance item (mean of 6.40, with 4 for median and mode). For the remaining of the items, their mean, median and mode were between 5 and 6, except for two items - insurance premium and cheaper finance - which were considerable lower, with each mean close to 2.

Table 7.10: ***Descriptive Statistics of Competitive Advantage***

	Descriptive statistics								
Competitive Advantage	N	Mean	Median	Mode	Min	Max	Std. Dev	Skewness	Kurtosis
Future environmental compliance	36	6.40	6	6	5	7	0.56	-0.29	-0.94
Community relations	36	5.92	6	6	4	7	0.91	-0.32	-0.80
Product quality	36	5.86	6	6	5	7	0.68	0.18	-0.75
Material efficiency	36	5.81	6	6	4	7	0.67	-0.37	0.56
Pressure groups relations positive	36	5.78	6	6	2	7	0.98	-1.40	4.74
Staff commitment	36	5.64	6	6	4	7	0.76	-0.09	-0.19
Media coverage	36	5.39	5	5	4	7	0.80	0.21	-0.24
Cheaper finance	36	1.97	2	2	1	6	1.13	1.93	4.51
Insurance premiums	35	1.94	2	2	1	5	0.94	1.48	2.82

Source: Based on the sample survey (2006)

Using a cut-off point of four as indicating favourable results of competitive advantage, the findings showed respondents believed they gained competitive advantages from a variety of environmental strategies. Among the competitive advantage strategies they claimed as beneficial were: environmental compliance; improve community relations; improved product quality; material efficiency; positive pressure group relations; staff commitment and positive media coverage. However respondents did not see any competitive advantage from lower insurance premiums and cheaper finance.

7.4 Reliability Analysis

Before using multi-item scales as a representation of each company's views of the variables, it is important to conduct a reliability analysis to know the item's reliability.

The analysis was performed on each item in the variables to determine the consistency of respondents' answers. Each variable (with the exception of regulatory stakeholder pressure) was statistically tested for its reliability and Table 7.11 shows the results. Table 7.11 shows that the Cronbach's alpha coefficient of all the variables was above 0.7, which shows *all items were reliable;* this being the value proposed by Nunnally (1978).

Table 7.11: ***Reliability Analysis of Variables***

Variables			No. Items	Cronbach's Alpha coefficient
Company Resources			6	0.74
Stakeholders	Regulatory		1	-
	Primary stakeholder		4	0.81
	Secondary		9	0.91
Environmental Strategies		Operational	19	0.77
		Tactical	10	0.89
		Strategic	11	0.93
Environmental Effectiveness			8	0.78
Competitive Advantage			9	0.75

Source: Based on the sample survey (2006)

7.5 Descriptive Statistics - Individual Company

In the previous sections, all variables were analysed based on respondents' answers but not on a company basis. This section looks at each variable for each company. An average answers, from the four individuals different managerial levels, was used to represent each company's resources, stakeholders' pressure, environmental effectiveness and competitive advantage. Meanwhile, average answers from the 21 operational managers (that is mill managers, assistant mill managers, estate managers, environmental officer and process engineer) as classified earlier in section 7.2.2 were used to represent each company's operational and tactical environmental strategies. In contrast, the strategic environmental strategy of each company was based on average answers from the higher management level (general and corporate managers, group engineers and plantation director). Overall environmental strategy for each company then was based on these three strategies.

7.5.1 Companies' Resources

Table 7.12 shows companies' resources for the nine surveyed companies. Comparison among companies showed company H recorded the highest resources (mean [m]=6.21) and in contrast, company A recorded the lowest resources (m=5.25). Other companies' resources varied between these two extremes. Comparing resources items within a company, it is observed that all companies, with the exception of company D, showed reputation as the highest rated resource, while most respondents rated technology as the lowest resource. Overall, not much difference was reported among resources in each company, judging from the small standard deviation range - where the largest standard deviation was 0.79 in company E and the lowest was 0.27 in company I.

Table 7.12: ***Companies' Resources***

	Company								
Resources	A	B	C	D	E	F	G	H	I
Financial	5.00	5.50	4.75	5.50	6.00	5.50	6.00	6.25	5.75
Physical	5.25	5.50	5.50	5.75	5.25	5.50	6.00	6.00	5.50
Human	4.75	5.50	5.75	5.25	6.25	5.25	6.00	5.50	5.75
Organisational	5.50	6.00	5.25	6.00	6.00	5.50	6.00	6.25	5.75
Technological	5.50	5.50	4.75	6.00	4.75	4.75	5.25	6.25	5.50
Reputation	5.50	6.75	6.25	5.25	7.00	6.25	6.25	7.00	6.25
Total mean	5.25	5.79	5.38	5.63	5.88	5.46	5.92	6.21	5.75
Standard deviation	0.32	0.51	0.59	0.34	0.79	0.49	0.34	0.49	0.27

Source: Based on the sample survey (2006)

7.5.2 Companies' Stakeholders' Pressures

Table 7.13 shows various stakeholders' pressure for each surveyed company. Comparison between companies showed management of company B perceived the highest pressure from stakeholders (m=5.11), but management of company G perceived the lowest pressure (m=2.59). For others, stakeholders' pressure varied between these two points. Using a cut-off point of four, from the scale of 1 (lowest pressure) to 7 (highest pressure), for the overall mean between high and low pressure groups, the management of four companies - B, F, H and I - perceived high stakeholders' pressure, but the rest perceived low pressure. It is true to say there was a noticeable difference in terms of the perception of stakeholders' pressure between companies.

Among stakeholders, respondents perceived environmental regulators wielded the highest pressure. This result could be expected, since in Malaysia the industry has been exposed to regulation for a considerable period of time (since the mid 1970s). Apart from regulatory stakeholders, other stakeholders who were considered as applying major pressure (overall mean more than or equal to 4) were competitors, customers, MPOA and MPOB. On the contrary, insurance companies, financial institution, distributors, and suppliers were overwhelmingly rated as exerting low pressure. This analysis suggests that environmental regulators were perceived to be the most powerful and influential stakeholders, but a number of stakeholders such as competitors, customers, industrial association and industrial board also exerted an influence on the industry, albeit a less degree of pressure.

Table 7.13: ***Companies' Stakeholders' pressures***

Stakeholder Pressure	Company A	B	C	D	E	F	G	H	I
Shareholders	4.00	5.25	3.25	3.00	3.25	3.75	2.25	5.00	5.25
Financial institution	3.33	4.50	2.25	2.25	3.00	2.00	2.00	1.75	2.00
Insurance companies	3.33	3.00	2.25	2.00	3.00	2.00	1.75	1.75	2.00
Environmental regulators	5.25	6.75	6.00	6.50	6.00	7.00	6.50	6.50	6.50
Local communities	3.25	5.50	2.75	3.25	3.00	5.00	2.25	5.75	5.00
Employees	2.25	5.00	3.75	3.00	2.50	5.50	2.25	5.75	4.00
Customers	3.50	5.75	1.75	2.25	5.00	5.00	3.75	5.25	3.75
Media	2.25	6.25	2.25	4.00	3.25	4.50	2.25	5.50	4.75
Suppliers	3.25	4.50	2.25	3.25	3.00	3.25	2.00	5.00	3.25
Distributors	2.50	4.25	2.25	1.75	2.75	4.50	1.75	5.00	3.25
Competitors	3.75	5.75	3.25	3.25	4.50	6.00	2.25	6.00	5.00
ENGOs	2.75	5.50	2.00	3.75	4.25	5.00	2.25	5.50	4.75
Association	4.50	4.50	4.00	4.50	5.75	5.00	2.25	5.25	3.75
Palm Oil Board	4.75	5.00	3.25	4.25	5.25	5.00	2.75	5.25	3.75
Total mean	3.55	5.11	2.95	3.36	3.89	4.54	2.59	4.95	4.07
Standard deviation	0.91	0.94	1.11	1.23	1.20	1.40	1.23	1.42	1.25

Source: Based on the sample survey (2006)

7.5.3 Environmental Strategies

An average of answers from operational managers was used to represent operational and tactical environmental strategies of each company (Table 7.14.and Table 7.15.). On the other hand, the strategic environmental strategy of each company was reported by general managers, a plantation advisor, group engineers, and plantation director who

held strategic position in their organisations, except for company C, who did not have any manager at strategic level. Average answers of all managers were used to represent the company's strategic level strategy.

7.5.3.1 Operational strategy

Table 7.14 shows operational strategy for responding companies. Comparison of total mean between companies showed that company H recorded the highest level of operational strategy (m=5.84), while both company A and E recorded the lowest operational strategy level (m=4.89). For the others, their means varied between these two extremes. Overall, there was not much difference in operational strategy values between the surveyed companies. Since the mean of all companies was greater than four (the mid point), it showed that operational environmental strategies were highly practised in all surveyed companies.

Meanwhile, comparison among strategy items within a company showed that the item related to reduced/nil open burning practice received the highest score of all items, suggesting this environmental practice is the top priority across the industry. Reduction of runoff, reduced usage of chemicals, emergency preparedness, reduction in water and electricity consumption, new agricultural techniques, new production processes in mills, such as oil extraction rate (OER), cleaner mill effluent, cleaner air emissions, reduced fuel consumption and putting a cost on environmental projects also received high scores – greater than 5.

In contrast, the least practised item related to marketing of waste/by product. All companies, except company B, recorded less than 4 points for this item. Other items that received low scores (less than 4) were: providing incentives to reward employees based on their environmental ideas, and using environmental management as part of company's marketing strategy.

As discussed earlier, that more attention is given by companies to the strategies of no open burning, reduction of runoff, reduced usage of chemicals, water, fuel and electrical consumption, new agricultural techniques, new production process, cleaner mill effluent and air emission, does not come as surprise as these practices in one way or another relate to environmental regulations and the economic efficiency of the industry. On the

other hand, practices like marketing of waste, rewarding employees for environmental ideas, and use of environmental management as part of company's marketing strategy were the least exercised, probably because they are not required by the law and at the same time were perceived as not contributing to companies' efficiency and income.

Table 7.14: ***Companies' Operational Environmental Strategies***

	Company								
Operational Strategy	A	B	C	D	E	F	G	H	I
Open burning reduced or nil	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.67
Chemicals usage reduced	6.00	6.00	7.00	6.00	6.00	6.00	7.00	7.00	6.33
Emergency preparedness	6.00	6.50	6.50	6.00	7.00	7.00	6.00	7.00	5.67
Run-off reduction	6.00	6.50	7.00	6.00	6.00	6.00	6.00	7.00	6.67
Air emissions controlled/ reduced	6.00	7.00	6.00	6.50	6.00	7.00	5.00	6.33	5.33
New agricultural techniques	5.50	6.00	7.00	6.00	5.50	6.00	6.00	6.33	5.67
Cleaner mill effluent	6.00	6.00	6.00	5.00	6.00	5.00	6.00	6.50	6.00
Fuel consumption reduced	6.50	6.00	7.00	6.00	4.00	6.00	5.00	6.33	5.00
Water consumption reduced	5.33	5.00	5.75	5.50	4.50	6.00	6.00	6.33	5.67
New production processes in mills	6.00	5.00	6.00	5.50	4.00	4.00	6.00	6.50	6.00
Electricity consumption reduced	5.33	4.50	5.25	6.00	4.50	6.00	6.00	5.67	5.67
Cost on environmental projects	5.67	5.00	5.00	5.00	5.00	6.00	5.00	6.33	5.00
Reduction of impact on flora and fauna	1.00	6.00	5.50	5.00	5.00	7.00	5.00	6.00	5.00
Environmentally friendly materials	4.50	5.00	4.00	6.00	4.00	6.00	3.00	5.00	5.67
Waste material usage	6.00	5.50	2.25	4.00	6.00	6.00	6.00	4.33	2.33
Marketing strategies	4.00	2.00	7.00	3.50	3.50	2.00	3.00	5.33	5.00
R&D	1.00	6.00	2.00	5.00	4.50	5.00	2.00	5.33	3.33
Employee incentive programmes	2.50	6.00	4.25	3.50	1.50	4.00	2.00	4.67	2.67
Market waste products	2.50	3.00	3.00	3.00	2.50	1.00	2.00	2.00	2.33
Total mean	4.89	5.50	5.45	5.29	4.89	5.42	4.95	5.84	5.05
Standard Deviation	1.82	1.28	1.64	1.10	1.44	1.64	1.68	1.23	1.38

Source: Based on the sample survey (2006)

7.5.3.2 Tactical Strategy

Table 7.15 shows tactical environmental strategies for surveyed companies. Comparison between companies shows that management in company B reported that they exercised the highest overall tactical environmental strategy level (mean m=5.60) while company A showed the lowest tactical strategy use (m= 2.55). If a cut-point of four for total mean is used to differentiate between companies that exercise high tactical strategy and low tactical strategy, companies which exercised high tactical strategies were B, D, E, F and the rest exercised low tactical strategy. This was in contrast with operational strategy where all companies highly exercised operational strategy.

Comparison between items showed that the four highest scoring practices include undertaking EMS projects (including ISO 14000), membership of RSPO, setting standards for suppliers/contractors, and publication of environmental management practices to employees. On the opposite end of the scale, the four least exercised practices were: audit of suppliers, suppliers/contractors sourcing decision based on their environmental dimension, product life cycle evaluation and involvement in stakeholders' projects. Low scores for the items of suppliers being audited for their environmental dimensions, and sourcing decisions based on suppliers' environmental dimensions, showed that supply chain management practices received little attention among surveyed companies. Furthermore, stakeholders' engagement is also not commonly practised by the surveyed companies, which was evident as both the stakeholders' consultation and the stakeholders' project items received low scores.

Table 7.15: ***Companies' Tactical Environmental Strategies***

	Company								
Tactical Strategy	A	B	C	D	E	F	G	H	I
Undertake EMS projects	2.33	6.50	1.25	6.00	5.50	7.00	5.00	5.67	4.33
Environmental standards set for supplies/contractors	3.33	5.00	5.00	5.50	5.00	5.00	5.00	4.00	3.00
Active role in industry (e.g. RSPO)	1.33	6.50	2.25	6.00	6.00	7.00	2.00	5.00	4.00
Employees receive company environmental publications	2.33	6.00	4.00	5.00	4.50	5.00	2.00	5.00	4.00
Stakeholder consultation	2.67	6.00	3.25	6.00	5.50	5.00	2.00	2.67	4.67
Stakeholder receive company environmental publications	2.33	6.00	3.50	6.00	3.50	7.00	2.00	2.00	4.00
Product life cycle evaluation	3.00	5.50	2.25	3.00	5.00	5.00	6.00	2.33	3.67
Sourcing decisions about suppliers	3.00	4.50	4.25	3.00	4.50	4.00	5.00	4.00	2.67
Involved in stakeholder projects	2.67	6.00	2.00	3.50	5.00	5.00	2.00	4.67	3.67
Suppliers audited	3.00	4.00	4.25	3.00	4.50	5.00	3.00	4.00	3.00
Total mean	2.60	5.60	3.20	4.70	4.90	5.50	3.40	3.93	3.70
Standard deviation	0.53	0.87	1.10	1.45	0.74	1.13	1.64	1.31	0.62

Source: Based on the sample survey (2006)

7.5.3.3 Strategic Strategy

Table 7.16 shows strategic strategy for surveyed companies. Companies that recorded exercising high strategic level strategies were: B, C, D, E, F and H (means greater than

4). The rest - company A, G and I - exercised low strategic level strategies. Noticeable difference was observed for these two categories of companies.

In terms of strategic items, the four highest rated practices were environmental issues being integrated with a long term business strategy, the company having a written environmental policy, having environmental objectives, and the board of directors concern about environmental management. Conversely, the least exercised strategies were related to environmental audit in the company, having a written environmental mission statement, and staff environmental training.

Table 7.16: ***Companies' Strategic Environmental Strategies***

	Company								
Strategic Strategy	A	B	C	D	E	F	G	H	I
Long term business strategy	4.00	6.50	4.25	5.50	6.50	7.00	5.00	6.00	4.00
Written environmental policy	4.00	7.00	4.50	6.50	5.50	7.00	2.00	6.00	4.00
Environmental objectives	4.00	6.50	5.00	6.00	6.00	7.00	2.00	6.00	3.00
Board of directors concern	3.00	6.50	4.50	5.50	7.00	6.67	2.67	6.00	3.00
Someone responsible for environmental management	2.00	6.00	4.00	6.00	7.00	7.00	2.00	6.00	4.00
Upper level staff has environmental training	4.00	5.00	3.75	5.50	3.50	6.67	4.00	5.00	4.00
Environmental committee influence on company	4.00	5.00	4.00	5.50	5.50	6.67	2.67	5.00	3.00
Written mission statement	3.00	6.50	3.50	6.50	4.00	5.67	2.00	6.00	4.00
Top management involvement	3.00	6.50	3.50	3.50	5.50	6.67	3.33	6.00	3.00
Staff training for all in environmental management	4.00	5.00	3.75	5.50	5.00	6.00	2.67	5.00	4.00
Environmental audit	2.00	6.00	4.25	5.00	4.00	6.33	3.00	5.00	2.00
Total mean	3.36	6.05	4.09	5.55	5.41	6.61	2.85	5.64	3.45
Standard deviation	0.81	0.72	0.46	0.82	1.20	0.44	0.96	0.50	0.69

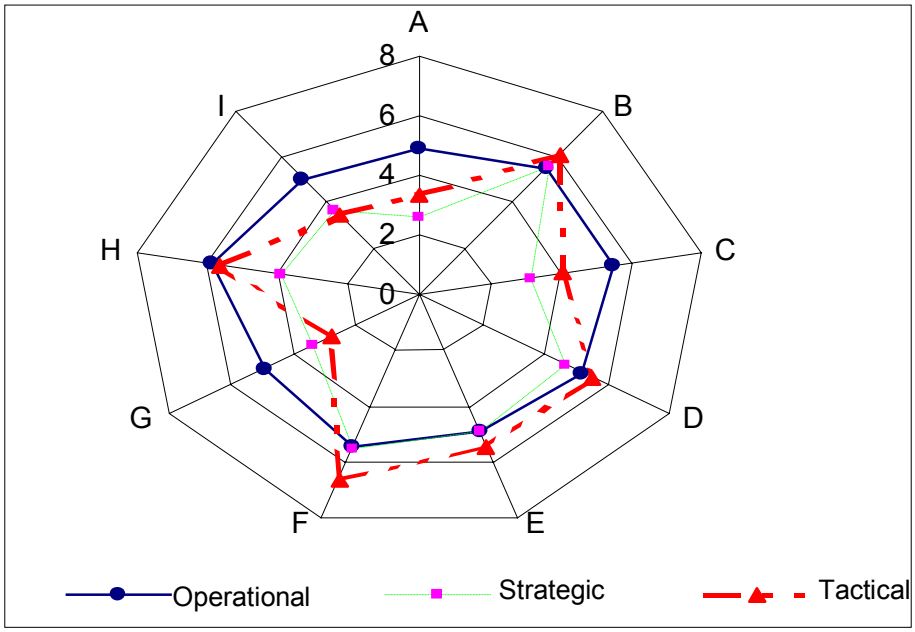
Source: Based on the sample survey (2006)

7.5.3.4 Comparison Between Strategies

The overall data analysis showed that in all companies, operational strategies recorded the highest average score among the three levels of environmental strategy, suggesting that this group of strategies were the most commonly practised, this is followed by strategic and then tactical strategies. Figure 7.1, a Radar chart that displays each of the environmental strategy levels against the companies, clearly shows these differences. Of the nine surveyed companies, companies B, D, E and F exercised high scores for both tactical and strategic strategies. Meanwhile, operational strategies were not only highly

practised, but at the same time less variation was observed between companies, compared to both tactical and strategic strategies. This indicates that, as a group of strategies, these are common practices in the palm oil industry.

Figure 7.1: ***Radar Chart - Environmental Strategies Against Companies***



Source: Based on the sample survey (2006)

Overall environmental strategy level is also showed in table 7.17. Company F had the highest level of overall environmental strategies (m=5.84); this was closely followed by company B (m=5.72). For the other three companies, D, E, H their means were closely grouped at 5.18, 5.06 and 5.14 respectively. Two companies had their mean between 4 and 5 - company C (m=4.25) and company I (m=4.07). Companies A and G had the lowest means - 3.62 and 3.73 respectively.

Table 7.17: ***Levels of Companies' Environmental Strategies***

	Company								
Strategy	A	B	C	D	E	F	G	H	I
Operational	4.89	5.50	5.45	5.29	4.89	5.42	4.95	5.84	5.05
Tactical	2.60	5.60	3.20	4.70	4.90	5.50	3.40	3.93	3.70
Strategic	3.36	6.05	4.09	5.55	5.41	6.61	2.85	5.64	3.45
Overall	3.62	5.72	4.25	5.18	5.06	5.84	3.73	5.14	4.07

Source: Based on the sample survey (2006)

7.5.4 Environmental Effectiveness

Table 7.18 shows environmental effectiveness among companies. Overall, there was not much difference between companies. Company B showed the highest effectiveness (m=6.19) and company D and I showed the lowest effectiveness (m=5.41). Since total means of all of the surveyed companies was more than the median point of four, it could be said that the respondents believed their companies demonstrate high levels of environmental effectiveness.

Table 7.18: ***Companies' Environmental Effectiveness***

	Company								
Environmental effectiveness	A	B	C	D	E	F	G	H	I
Environmental law compliance	7.00	7.00	6.50	6.00	7.00	7.00	6.75	6.25	6.25
Investment in new technology	4.75	6.25	5.50	4.75	5.50	6.00	5.00	6.25	5.75
Reduced operational costs	5.75	5.25	5.50	4.75	4.75	5.00	3.00	6.25	5.50
Reduced complaints	6.25	6.50	5.50	5.75	6.50	7.00	6.25	6.25	6.00
Environmental accidents reduced	5.75	6.25	5.25	6.00	6.50	6.00	6.00	6.25	5.00
Environmental systems effective	5.50	5.75	5.75	5.50	5.75	6.75	5.50	6.25	5.00
Stakeholder relationships good	5.75	6.00	5.50	5.75	5.75	5.00	6.00	6.25	5.00
Environmental activity disclosure	4.67	6.50	4.75	4.75	4.25	5.25	6.00	5.50	4.75
Total mean	5.70	6.19	5.53	5.41	5.75	6.00	5.56	6.16	5.41
Standard deviation	0.76	0.53	0.49	0.57	0.93	0.86	1.16	0.27	0.55

Source: Based on the sample survey (2006)

Among the specific items measured, the four high items that recorded the overall highest scores were those related to environmental law compliance, reduced complaints, reduction in environmental accidents and effective environmental systems. The four lower scored items related to cost reduction, environmental activity disclosure, investment in new technology, and good relationships with stakeholders. However, judging from the low standard deviation, less than 1.00 for all companies (with the exception of G, std.dev.=1.16), there was not much variation among the measures of environmental effectiveness within each company.

7.5.5 Competitive Advantage

As with environmental effectiveness, all respondents in the surveyed companies believed their companies gained high competitive advantage overall (Table 7.19). The highest score was company B (m= 5.31) and the lowest was company H (m=4.50).

In terms of individual items, overwhelmingly the surveyed companies recorded future environmental compliance as the highest competitive advantage strategy, in turn followed by improved community relations, product quality and positive pressure group relations. The two lowest perceived strategies, in terms of gaining competitive advantages for their companies, were cheaper finance and lower insurance premiums. The low standard deviation of all companies (less than 0.8) showed there is a low variation among competitive items within each company.

Table 7.19: ***Companies' Competitive Advantage***

	Company								
Competitive Advantage	A	B	C	D	E	F	G	H	I
Insurance premiums	2.67	3.00	1.75	2.00	2.00	1.50	2.00	1.50	1.25
Cheaper finance	2.00	3.75	1.75	2.00	2.75	1.50	1.25	1.25	1.50
Community relations improved	5.75	6.00	6.50	5.50	6.00	6.75	6.75	5.00	5.00
Staff commitment	5.75	6.00	6.00	5.50	6.00	6.50	4.75	5.25	5.00
Product quality improved	5.50	6.00	6.25	5.75	6.00	6.00	6.25	5.50	5.50
Material efficiency improved	5.50	5.75	6.25	5.75	5.50	6.00	6.00	5.50	6.00
Pressure groups relations positive	5.75	5.25	6.00	5.75	6.00	6.75	6.00	5.00	5.50
Media coverage	5.75	5.75	5.75	5.75	5.50	4.75	5.00	5.00	5.25
Future environmental compliance	6.00	6.25	6.50	5.75	6.50	7.00	6.75	6.50	6.75
Total mean	4.96	5.31	5.19	4.86	5.14	5.19	4.97	4.50	4.64
Standard deviation	0.17	0.32	0.28	0.12	0.35	0.76	0.79	0.54	0.62

Source: Based on the sample survey (2006)

7.6 Tests for Parametric and Non-Parametric Data

The major choice of statistical methods is dependent on whether the data is parametric or non parametric. A common test of normality is the Kolmogorov-Smirnov test. All the surveyed companies' research variables were tested by means of a one-sample Kolmogorov-Smirnov Test. The significance level of Kolmogorov-Smirnov Z test of most variables was less or equal 0.05. Thus, the test of normality results (Table 7.20) indicated that the data (with the exception of resources, operational strategy and competitive advantage) were non-parametric or not normally distributed. This leads to the selection of non-parametric methods for hypothesis testing. Types of non-parametric methods to test the research hypotheses will be discussed in section **7.8.**.

Table 7.20: ***One-sample Kolmogorov-Smirnov Test of Normality***

Variable		Mean	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
Resources		5.70	1.13	0.072
Stakeholder Pressure -	Regulatory	6.33	1.41	0.037
	Primary	3.53	1.37	0.050
	Secondary	4.06	1.40	0.038
Environmental Strategy -	Operational	5.25	0.90	0.074
	Tactical	4.17	1.13	0.039
	Strategic	4.78	1.47	0.042
Environmental Effectiveness		5.75	0.89	0.050
Competitive Advantage		4.98	1. 32	0.081

Source: Based on the sample survey (2006)

7.7 Company Environmental Strategy Proactiveness

There has been considerable reference to corporate environmental management strategies in the literature, but there is no agreed development of the scale by which to classify the behaviour or action of businesses (Aragon-Correa, 1998; Buysse & Verbeke, 2003; Gil, Jimenez, & Lorente, 2001; Henriques & Sadorsky, 1999; Tilley, 1999). One of the objectives of this research is to measure which environmental practices are being used by the surveyed companies, and to make an exploratory judgement of the scale of environmental strategies for Malaysian palm oil companies.

In this study, the researcher categorised the surveyed companies' proactiveness related to their environmental strategies - operational, tactical and strategic strategies. Categorisation was performed using Cluster Analysis in which groups of cases (companies) that shared common characteristics were identified. In the analysis the hierarchical cluster procedure was used because it is appropriate for data sets containing less than 200 cases (Francis, 2004 p.149). In this cluster analysis the distance between two cases was measured by Ward's method. Additionally, Z scores were used to standardise the variables in order to give all criteria an equal weight in the subsequent cluster analysis (Hair, Black, Babin, Anderson, & Tatham, 2006 p.602). The Squared Euclidean distance method was used for calculating the distance between two cases; the method, which uses the sum of the squared differences over all variables, is the most commonly used measure of the distance between two points (Francis, 2004 p.149).

In the hierarchical cluster analysis the researcher expected three to five clusters in the solution. This is based on the findings in the literature concerning environmental strategies that levels of companies' environmental strategy proactiveness varied between three and five (Chapter Three, section 3..2.2). The output of the cluster analysis is shown in an icicle plot of SPSS output in Figure 7.2. It shows a number of cluster solutions and the number of companies under each cluster in the solution.

Figure 7.2: ***Icicle Plot of Companies and Number of Clusters***

	Company																
No. of Cluster	E		D		H		F		B		I		G		C		A
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
3	X	X	X		X	X	X	X	X		X	X	X	X	X	X	X
4	X	X	X		X	X	X	X	X		X	X	X		X	X	X
5	X	X	X		X		X	X	X		X	X	X		X	X	X
6	X	X	X		X		X	X	X		X	X	X		X		X
7	X	X	X		X		X	X	X		X		X		X		X
8	X		X		X		X	X	X		X		X		X		X

Source: Based on the sample survey (2006)

Subsequently each number of expected clusters (3, 4 and 5) in turn was entered in the hierarchical cluster analysis in SPSS. Output for each cluster solution is shown in Table 7.21. To determine what is the best number of clusters of environmental strategy proactiveness, significant difference of these variables across the clusters in the three-cluster solutions, four-cluster solutions and five-cluster solutions were examined using a non-parametric Median Test.

In the three-cluster solutions, the chi-square values of the test showed each strategy variable (operational, tactical and strategic) was significantly different at 0.05 level. On the other hand, in the four-cluster solution, the chi-square values of the test showed that two out of three variables (operational and tactical) were statistical significance at 0.05 level, but the strategic strategy variable did not show significant differences across the clusters. In contrast, in the five-cluster solution, none of variables showed a significant difference at the 0.05 level across the five clusters. Since three-cluster solution showed significant difference among all three variables, this research has used three clusters of environmental strategies of the surveyed companies.

Table 7.21: ***Assessing Environmental Strategy Variables Validity for Different Clusters Solutions***

Cluster Solution	Cluster		Level of strategy Operational	Tactical	Strategic
3	1		5.08	3.23	3.44
	2		5.59	5.01	6.10
	3		5.08	4.80	5.48
			Statistical Significance of strategy variables		
		Median	5.29	3.93	5.40
		Chi-Square	5.96	6.30	6.98
		Significance	0.05*	0.04*	0.03*
4	1		4.96	3.23	3.22
	2		5.46	5.55	6.33
	3		5.64	3.57	4.86
	4		5.07	4.80	5.48
			Statistical Significance of strategy variables		
		Median	5.29	3.93	5.41
		Chi-Square	9.00	9.00	4.95
		Significance	0.03*	0.03*	0.18
5	1		4.96	3.23	3.22
	2		5.46	5.55	6.33
	3		5.45	3.20	4.09
	4		5.08	4.80	5.48
	5		5.84	3.93	5.64
			Statistical Significance of strategy variables		
		Median	5.29	3.93	5.04
		Chi-Square	9.00	9.00	6.98
		Significance	0.06	0.06	0.14

* significant at 0.05 level.
Source: Based on the sample survey (2006)

Examination of the third row - 3-cluster solution - of the Icicle plot (Figure 7.2) shows a continuous line of crosses from the company E column to the company D column. This represents one cluster, containing company E and D. Then there is a gap, before another continuous row of crosses, which defines the second cluster that contains companies H, F and B. Then there is a third cluster consisting of companies I, C, G, and A.

The results of cluster analysis are clearly shown in the cluster membership table (Table 7.22). As derived from the 3 cluster solution, Cluster 1 consists of four companies: A, C, G and I; Cluster 2 consists of three companies: B, F, H; and Cluster 3 consists of companies D and E.

Table 7.22: ***Cluster Membership of Companies of Three Clusters Solution***

Cluster	Company	No. of companies
1	A, C, G, I	4
2	B, F, H	3
3	D, E	2

Source: Based on the sample survey (2006)

From the results shown in Table 7.23 it is observed that companies in cluster 2 had the highest mean for all environmental strategies (operational, tactical and strategic). The companies in this cluster outperformed the other companies on all criteria. This was followed by companies in cluster 3, where this cluster had a lower value of all levels of strategy than cluster 2, but had higher values for both tactical and strategic strategy and an equal value of operational strategy to companies in cluster 1. Companies in cluster 1 had the lowest mean overall.

Table 7.23: ***Company Clusters and Environmental Strategies***

		Cluster		
Environmental Strategy		1	2	3
Operational	Mean	5.08	5.59	5.08
	Std. Deviation	0.25	0.22	0.33
Tactical	Mean	3.23	5.01	4.80
	Std. Deviation	0.47	0.93	0.49
Strategic	Mean	3.44	6.10	5.48
	Std. Deviation	0.51	0.49	1.00
All	Mean	3.92	5.57	5.12
	N	4	3	2
	Std. Deviation	0.29	0.08	0.38

Source: Based on the sample survey (2006)

Considering these three company clusters in relation to environmental strategies they employed, and the way they differed, especially in the items in strategic and tactical level strategies, the researcher created classifications (a typology) for the company clusters, to describe their proactiveness in relation to environmental issues, as follows: the four companies - A, C, G, I -that fell under the first cluster are classified as *Minimalists*, the two companies in third cluster - companies D and E – are classified as *Intermediators*; and companies B, F, and H, which fell under second cluster, are classified as *Proactivists*. The most proactive group of companies, the proactivists seemed likely to practice more tactical and strategic environmental strategies, which

were voluntary and tend to be long term in nature. On the other hand, minimalist seemed to concentrate more on operational strategies, which are considered as standard practices in the industry. As for intermediators, they started to exercise voluntary practices at tactical and operational level but are yet to achieve level of proactivists.

Nonetheless, one drawback of using simple averages to represent various levels of strategy performance is that it does not show which items significantly differed across the three clusters. The following section discusses items within each variable, and across the company clusters, in more detail.

7.7.1 Level of Environmental Strategy and Companies' Environmental Proactiveness

The results of detailed analysis of items in each level of environmental strategy help to highlight key practices by showing the extent to which individual practices were reported by companies in each proactiveness cluster.

7.7.1.1 Companies' Environmental Strategy Proactiveness and Operational Strategy

Results in Table 7.24 show reported use of operational strategy items against each of the environmental strategy proactiveness company clusters. Though overall operational strategy shows considerable difference in scores between various environmental strategies, in general, not much variation in the items appeared across the company clusters. Of the nineteen items, only four items differed significantly at 0.05 level across environmental proactiveness clusters. These four items related to: (i) controlling/reducing air emission in mills (ii) reducing impact on flora and fauna (iii) incentive programmes rewarding employees' ideas on environmental performance and (iv) R&D to improve environmental performance.

No significant difference was observed for the other fifteen operational strategies showing that, by and large, surveyed companies exercised the same level of practice of the items. In other words, those items are commonly exercised and considered as standard industry practices.

Table 7.24: ***Operational Strategies in Environmental Proactiveness Company Clusters***

	Environmental Proactiveness				
Operational strategy	Minimalist	Intermediator	Proactivist	Median	Chi-Square
Efforts to reduce water consumption	5.69	5.00	5.78 (8)	5.67	2.25
Efforts to reduce electricity consumption	5.56	5.25	5.39(10)	5.67	0.38
Practice reuse of waste materials	4.14	5.00	5.28 (12)	5.50	0.23
Use eco/environmentally friendly material	4.29	5.00	5.33 (11)	5.00	0.38
Creating market for waste/by product	2.46	2.75	2.00 (16)	2.50	0.38
New agricultural techniques to increase efficiency in plantation	6.04	5.75	6.11 (6)	6.00	0.80
New production process to increase efficiency (e.g. OER)	6.00	4.75	5.17	6.00	2.25
New and cleaner mill effluent	6.00	5.50	5.83	6.00	2.25
Controlling/reducing open burning	6.92	7.00	7.00	7.00[a]	-
Controlling/reducing air emissions	5.58	6.25	6.78	6.00	6.98*
Reducing usage of chemicals	6.58	6.00	6.50	6.33	2.25
Reducing run-off and sedimentation	6.42	6.00	6.50	6.00	2.25
Reducing impact on flora and fauna	4.13	5.00	6.33	5.00	5.96*
Incentive programmes to reward employees' ideas on environmental performance	2.86	2.50	4.89	3.50	5.96*
R&D to improve environmental performance	2.08	4.75	5.44	4.50	6.98*
Emergency preparedness and action	6.04	6.50	6.83	6.50	3.75
Reduce logistic fuel consumption	5.87	5.00	6.11	6.00	1.50
Marketing application related to environmental management	4.75	3.50	3.11	3.50	3.26
Putting a cost on environmental programmes or projects	5.17	5.00	5.78	5.00	2.63

a. All values are less than or equal to the median. Median Test cannot be performed.
*. The difference is significant at 0.05 level.
Source: Based on the sample survey (2006)

In all of the environmental proactiveness categories, companies are likely to exercise a high level of adherence to the following practices: controlling and reducing open burning, emergency preparedness, cleaner palm oil mill effluent, lowering usage of utilities (water, electricity, and fuel), reducing consumption of chemicals (pesticides and

non-organic fertilizer), implementing new agricultural practices to increase efficiency in plantations, introducing new production process to increase efficiency (e.g. oil extraction rate), action to reduce run-off, reuse of waste material, reused waste and environmentally friendly materials, and putting a cost on environmental programmes or projects. However, the two common least practised strategies by companies in all categories of environmental proactiveness related to creating a market from waste and by products, and the application of marketing strategies related to environmental management. This shows that the surveyed companies did not do much to generate income by selling their waste. But at the same time, despite exercising other environmental strategies, they did not make much effort to market their companies as environmentally friendly companies.

7.7.1.2 Companies' Environmental Strategy Proactiveness and Tactical Strategy

Out of ten items in the tactical strategy variable, half of the items showed significant difference at 0.05 levels for environmental proactiveness clusters (Table 7.25). These items were: (i) having undertaken any EMS projects (such as ISO 14000) that may improve company performance, (ii) organisation plays an active role in environmental management in the Malaysian palm oil industry (e.g. the RSPO). (iii) publication of environmental management activities to external stakeholders (e.g. environmental report produced on its own, or in annual report or website), (iv) including stakeholders' consultation in environmental management and (v) involvement in projects or environmental activities with stakeholders for the betterment of the environment.

The results showed that proactivists exercised better tactical strategy than minimalists. The proactivist companies had better environmental management systems, such as ISO 14000, or total quality environmental management (TQEM), to deal with environmental issues, which in turn might help improve their environmental performance. This was in contrast with minimalists, as they normally dealt with environmental issues in an ad-hoc manner. Moreover, proactivists showed high engagement with stakeholders. This was evident as these companies are actively involved with RSPO, they also included stakeholders in consultation, and are engaged in projects with ENGOs. A further difference between proactivists and minimalists was that the former exercise more disclosure of their environmental management to the public through their annual

reports. They proactively communicated about their environmental management with their external stakeholders to show that they are more transparent companies.

Table 7.25: ***Tactical Strategies in Environmental Proactiveness Company Clusters***

Tactical strategy	Environmental Proactiveness				
	Minimalist	Intermediator	Proactivist	Median	Chi-Square
Environmental standards set for supplies/contractors	4.08	5.25	4.67	5.00	3.94
Suppliers audited	3.31	3.75	4.33	4.00	0.38
Sourcing decisions about suppliers based on environmental dimensions	3.73	3.75	4.17	4.00	0.23
Undertake EMS projects (eg TQEM, ISO 14000)	3.23	5.75	6.39	5.50	6.98*
Product life cycle evaluation pertaining to the environment	3.73	4.00	4.28	3.67	1.24
Plays an active role in environmental management in Malaysian palm oil industry (eg. RSPO)	2.40	6.00	6.17	5.00	6.30*
Publication of environmental management to employees through newsletter, bulletin or procedures	2.96	4.75	5.00	3.50	1.24
Publication of environmental management to external stakeholders (environmental report, annual report)	3.08	4.75	5.33	4.50	6.98*
Include stakeholder consultation in environmental management	3.15	5.75	4.56	4.67	6.30*
Involved in projects or environmental management with stakeholders	2.59	4.25	5.22	3.67	6.98*

* The difference is significant at 0.05 level
Source: Based on the sample survey (2006)

7.7.1.3 Companies' Environmental Strategy Proactiveness and Strategic Strategy

Eight out of eleven items in strategic strategy show significant difference between environmental proactiveness clusters (Table 7.26). These items related to: (i) members of board of directors concern about environmental performance, (ii) organisation integrates environmental issues with long-term business strategy, (iii) written environmental mission statement, (iv) written environmental policy, (v) top management's high involvement in environmental management, (vi) conducting environmental audit of environmental performance (vii) environmental committee or

group has a direct influence on top management and (viii) all level of staff are involved in environmental training.

Table 7.26: ***Strategic Strategy in Environmental Proactiveness Company Clusters***

Strategic strategy	Environmental Proactiveness				
	Minimalist	Intermediator	Proactivist	Median	Chi-Square
Members of board directors concerned environmental performance	3.29	6.25	6.39	5.50	6.98*
Integrating environmental issues with long-term business strategy	4.31	6.00	6.50	5.50	6.98*
Written environmental mission statement	3.13	5.25	6.06	4.00	6.98*
Written environmental policy	3.63	6.00	6.67	5.50	6.98*
Setting environmental objectives to be achieved	3.50	6.00	6.50	6.00	5.14
Someone is responsible for environmental management	3.00	6.50	6.33	6.00	2.25
Top management high involvement in environmental management	3.21	4.50	6.39	3.50	6.98*
Conducting environmental audit of environmental performance	2.81	4.50	5.78	4.25	6.98*
Environmental committee or group has a direct influence on top management	3.42	5.50	5.56	5.00	6.00*
Providing training in environmental management	3.61	5.25	5.33	5.00	2.25
All level of staff involvement in environmental training	3.94	4.50	5.56	4.00	6.98*

* The difference is significant at 0.05 level
Source: Based on the sample survey (2006)

This analysis showed proactivist companies had taken environmental issues very seriously by integrating environmental issues into their long terms strategy. The proactivists had a clear environmental goal as they established a written mission statement and in order to achieve this, they also established their own environmental policy by which management guided their employees as to what they should do, or not, pertaining to environmental issues. Environmental training for all level of staff made proactivists differ from minimalists. In addition, the seriousness of proactivists' strategy in environmental management was demonstrated by the establishment of a committee or formal group in their companies to deal with environmental issues and more importantly this group could influence top management in dealing with environmental

issues. Top management involvement in environmental management, coupled with members of the board of directors who were concerned about companies environmental management, were two other practices that demonstrated the commitment of proactivists towards their corporate environmentalism.

7.7.2 Environmental Proactiveness and Stakeholders' Pressures

Table 7.27 and Table 7.28 show individual stakeholder pressures for companies in different environmental strategies proactiveness clusters, and stakeholder groups pressure for different environmental strategies proactiveness companies respectively. Overall, proactivists perceived more stakeholders' pressure compared to intermediators and minimalists. The proactivists recorded the highest mean for each stakeholder's item. This was followed by intermediators, who perceived more pressure from stakeholders' groups than minimalists. In the case of individual stakeholders, with the exception of shareholders, local communities, employees and distributors, intermediators' means were higher than minimalists' means.

Table 7.27: ***Individual Stakeholder Pressures in Environmental Proactiveness Company Clusters***

Stakeholder		Environmental Proactiveness		
		Minimalist	Intermediator	Proactivist
Regulatory stakeholder		6.06	6.25	6.75
Primary stakeholder	Shareholders	3.69	3.13	4.67
	Financial institutions	2.33	2.63	2.75
	Insurance companies	2.27	2.50	2.25
	Employees	3.06	2.75	5.42
	Customers	3.19	3.63	5.33
	Suppliers	2.69	3.13	4.23
	Distributors	2.43	2.25	4.58
	MPOA	3.63	5.13	4.92
	MPOB	3.63	4.75	5.08
Secondary stakeholder	Local communities	3.31	3.13	5.42
	Media	2.88	3.63	5.42
	Competitors	3.56	3.88	5.92
	ENGOs	2.94	4.00	5.33

Source: Based on the sample survey (2006)

Using a cut-off point of four on the scale from 1 (very low pressure) to 7 (very high pressure) to differentiate between low and high stakeholders' pressure in all environmental proactiveness clusters, each cluster of companies had a different number

of major stakeholders that impinged on them. For minimalists, all stakeholders exerted low pressure except for environmental regulators. This suggests that their management showed a reactive pattern, which tended to neglect other stakeholders and the pressures they apply. For intermediators, of the fourteen stakeholders only four were considered as imposing high pressure. They were: environmental regulators, MPOA, MPOB and ENGOs. Comparing these two strategy groups showed that intermediators perceived major threats from a larger number of stakeholders.

Table 7.28: ***Stakeholder Groups Pressure in Environmental Proactiveness Company Clusters***

		Environmental Proactiveness		
Stakeholder		Minimalist	Intermediator	Proactivist
Regulatory stakeholder -	Mean	6.06	6.25	6.75
	Std. Deviation	0.59	0.36	0.25
Primary stakeholder -	Mean	3.00	3.32	4.36
	Std. Deviation	0.57	0.57	0.33
Secondary stakeholder -	Mean	3.17	3.65	5.52
	Std. Deviation	0.59	0.35	0.25
Overall mean		4.08	4.40	5.54
N		4	3	2
Standard deviation		0.58	0.12	0.17

Source: Based on the sample survey (2006)

The above results indicate that the more proactive the companies, the greater the number of stakeholders they perceived exerted high pressure on them. Wider stakeholders' pressure seemed to increase the level of their environmental proactiveness. In this analysis it was clear that the adoption of environmental strategies by companies varied according to number of institutional stakeholders' pressures. Meanwhile, in terms of similarity between these groups of companies, overwhelmingly the environmental regulators were perceived by all of the surveyed companies as applying the highest pressure (albeit the more proactive strategy group had the higher mean). In addition, both financial institution and insurance companies were perceived as the lowest pressure group by all of them.

7.7.3 Companies' Environmental Proactiveness and Environmental Effectiveness

Table 7.29 shows environmental effectiveness against environmental strategy proactiveness. Using a cut-off point of four on the scale of 1 (strongly disagree) to 7

(strongly agree) to differentiate between positive results in environmental effectiveness and no results in environmental effectiveness, it was found that the management of all companies perceived their companies gained environmental effectiveness.

Table 7.29: Companies' *Environmental Proactiveness and Environmental Effectiveness*

	Environmental Proactiveness		
Environmental Effectiveness	Minimalist	Intermediator	Proactivist
Complying with environmental law	6.63	6.50	6.75
High level of investment in new technology	5.25	5.13	6.17
Environmental strategies have reduced operational cost	4.94	4.75	5.50
Few complaints in the past 5 years	6.00	6.13	6.58
Less environmental accidents in the past 5 years	5.50	6.25	6.17
Effective environmental system to deal environmental issues	5.44	5.63	6.25
Good relationship with stakeholders	5.56	5.75	5.75
High public environmental disclosure to stakeholders	5.04	4.50	5.75
Overall mean	5.54	5.58	6.11
N	4	2	3
Minimum	4.94	4.50	5.50
Maximum	6.63	6.50	6.75
Standard deviation	0.55	0.73	0.43

Source: Based on the sample survey (2006)

Comparison between strategic proactiveness company clusters, showed that proactivists (mean= 6.11) perceived a slightly higher level of environmental effectiveness compared to intermediators (m=5.58) and minimalists (m=5.54). The proactivists recorded a higher mean for each environmental effectiveness measure compared to both intermediators and minimalists (with the exception of less environmental accidents in the past 5 years, which was slightly higher for intermediators). In terms of environmental effectiveness measures, overwhelmingly complying with environmental law was the highest effectiveness factor for all groups. On the contrary, the item - environmental strategies have reduced operational cost - was at the bottom.

7.7.4 Companies' Environmental Proactiveness and Competitive Advantage

As Table 7.30 shows that, using a cut point of four on the scale of 1 (no result in competitive advantage) to 7 (resulted in competitive advantage) to differentiate between

strategies that resulted in competitive advantage and those that did not, analysis showed that management of surveyed companies in all categories perceived they gained competitive advantage as a result of their environmental strategies. A comparison between strategic proactiveness groups of companies shows very little difference between them in terms of each of the competitive advantage strategies. It seemed that companies at all levels of environmental proactiveness showed the same values of perceived competitive advantage.

Table 7.30: ***Environmental Proactiveness and Competitive Advantage***

	Environmental Proactiveness		
Competitive Advantage	Minimalist	Intermediator	Proactivist
Insurance premiums	1.92	2.00	2.00
Cheaper finance	1.63	2.00	2.00
Improved community relations	6.00	5.75	5.92
Increased staff commitment	5.38	5.75	5.92
Improved product quality	5.88	5.88	5.83
Improved material efficiency	5.94	5.63	5.75
Positive pressure groups relations	5.82	5.88	5.67
Improved media coverage	5.44	5.63	5.17
Assured present and future environmental compliance	6.50	6.13	6.58
Overall mean	4.94	5.00	5.00
N	4	2	3
Minimum	1.63	2.00	2.00
Maximum	6.50	6.13	6.58
Standard deviation	1.82	1.61	1.69

Source: Based on the sample survey (2006)

In terms of the competitive advantage items, assured present and future environmental compliance was the highest competitive advantage strategy for all proactiveness levels of the companies. On the contrary, both insurance premiums and cheaper finance were rated at the bottom of competitive advantage strategies for all levels of proactiveness.

7.8 Hypothesis Testing using Non-Parametric Methods

There were seven testable hypotheses in this study. Both a null hypotheses (Ha) and an alternative (Hb) were developed for each hypothesis:

Hypothesis 1

H1a There is no significant difference of regulatory pressure among environmental strategies.

H1b There is a significant difference of regulatory pressure among environmental strategies.

Hypothesis 2

H2a There is no significant difference of primary stakeholder pressure among environmental strategies.

H2b There is a significant difference of primary stakeholder pressure among environmental strategies.

Hypothesis 3

H3a There is no significant difference of secondary stakeholder pressure among environmental strategies.

H3b There is a significant difference of secondary stakeholder pressure among environmental strategies.

Hypothesis 4

H4a There is no significant difference of environmental effectiveness among environmental strategies.

H4b There is a significant difference of environmental effectiveness among environmental strategies.

Hypothesis 5

H5a There is no significant difference of competitive advantage among environmental strategies.

H5b There is a significant difference of competitive advantage among environmental strategies.

Hypothesis 6

H6a Company's size does not affect the correlation between stakeholders' pressure and environmental strategies adopted by surveyed companies

H6b Company's size affects the correlation between stakeholders' pressure and environmental strategies adopted by surveyed companies

Hypothesis 7

H7a Company's resource availability does not affect the correlation between stakeholders' pressure and environmental strategies adopted by surveyed companies

H7b Company's resource availability affects the correlation between stakeholders' pressure and environmental strategies adopted by surveyed companies

Based on the Kolmogorov-Smirnov test of the data (section 7.6), it appears that the data are non-parametric. This led to the selection of non-parametric techniques for testing the research hypotheses. An additional, reason for using these non-parametric methods for hypothesis testing was the small sample size of the study - involved only nine palm oil companies out of a population of thirty seven.

To test hypotheses 1 to 5, a non-parametric Median Test was deemed appropriate when two or more groups of cases of a variable are to be compared. The groups of cases must be independent or the subject must be a member of only one group. In other words each group is mutually exclusive. Median tests were carried out for the 'level of significant difference' between stakeholder pressure on the company, environmental effectiveness

strategies, and competitive advantage strategies, against the three levels of environmental strategy proactiveness of the companies: minimalist (lower compliance), intermediator (medium compliance), and proactivist (high compliance).

Low significance values of less than or equal to 0.05 (5% probability that the values are the same) would suggest that each independent variable (stakeholder pressure, environmental effectiveness, and competitive advantage) are not the same, or are incongruent, for different environmental strategy proactiveness types. In contrast, a large significance number, over 0.05, would support the view that the values are the same in different environmental proactiveness levels.

However, one drawback of using the Median Test is that it only produces a significance result that indicates differences in stakeholders' pressure, environmental effectiveness and competitive advantage in relation to the three categories environmental strategy proactiveness, the test does not significantly show which pairs of environmental strategies differ. This requires a further analysis using a test involving multiple comparison procedures. The post hoc contrast of the Bonferroni procedure ANOVA test is appropriate for this purpose. In this situation, the Bonferroni parametric test for differences assisted in the identification of different levels of environmental strategy proactiveness against the variables of stakeholders' pressure on companies, environmental effectiveness measures, and competitive advantage measures. However, this required an assumption of normality of the research data. Moreover, a visual inspection of data also supports the findings of the Bonferroni test.

For Hypotheses 4 and 5 the partial correlation test is appropriate. Both company's size (plantation area and number of employees) and resources availability were tested to investigate if each affects the correlation between stakeholders' pressure and overall environmental strategies. The small number of companies in each environmental strategy proactiveness category (4 minimalists, 3 proactivists, and 2 intermediators) prevented the researcher from investigating the effect of control variables on each environmental strategy proactiveness group through a Multivariate Analysis of Variance (MANOVA). Though partial correlation does not describe the effect of company size on each strategy proactiveness category, overall it is able to show the effect of control

variables on the relationship between stakeholder pressure and overall environmental strategies.

In the test, the effects of control variables (plantation area and resources availability of companies) on the correlation between stakeholders' pressure and environmental strategy can be observed by comparing zero-order correlations (without any control variable) with partial correlations (with control variable). Additionally, in the zero-order correlations, the correlation between the control variables (plantation area and resources availability) and stakeholders' pressure and environmental strategies can also be observed, to see if there is any significant correlation between them.

Hypothesis 1

The results of the median test for regulatory stakeholder pressure against different levels of environmental strategy proactiveness, shown in Table 7.31, indicate that all minimalist companies recorded regulatory stakeholder pressure below or the equal to median. The same observation was also true for intermediators, while, out of three proactivists, two showed regulatory stakeholder pressure above the median. This visual inspection of data showed only a small difference between proactivists and both minimalists and intermediators in terms of regulatory stakeholder pressure.

Table 7.31*: Frequencies and Test Statistics of Median Test of Stakeholders' Pressures against Categories of Environmental Strategy Proactiveness*

Stakeholders		Minimalist	Intermediator	Proactivist	Median	Chi-Square	Sig.
Regulatory	> Median	0	0	2	6.5	5.14	0.08
	<= Median	4	2	1			
Primary	> Median	0	1	3	3.49	6.98	0.03*
	<= Median	4	1	0			
Secondary	> Median	1	0	3	3.75	5.96	0.05*
	<= Median	3	2	0			

* The difference is significant at the 0.05 level.
Source: Based on the sample survey (2006)

A further investigation confirmed this assumption. Table 7.31 shows regulatory stakeholder analysis results of median 6.5, Chi-Square 5.14, and significance 0.08. As the significance is higher than the 0.05 level, this signified that there was no significant

difference of regulatory pressure between the proactiveness strategies. Thus we ***fail to reject the null hypothesis.***

Hypothesis 2

Table 7.32 also shows test results for primary stakeholder pressure against various environmental strategy proactiveness groups. All four minimalist companies record primary stakeholders' pressure as below or equal to the median. This is in contrast with proactivists, where all companies recorded primary stakeholders' pressure above the median. In the medium compliance group, the intermediators, one company recorded above the median and one recorded below or equal to the median in terms of primary stakeholders' pressure. These results showed a noticeable difference between proactivists and minimalists in their perceptions of primary stakeholders' pressure. The median test in the Table 7.31 shows the assumed significance in the test of 0.03. Since this is less than 0.05 level, there is significant difference of primary stakeholders' pressure among these 3 environmental proactiveness strategies. Therefore ***the null hypothesis is rejected and its alternative hypothesis is accepted***.

To determine which of the primary stakeholders is perceived as significantly different among the environmental strategy categories, the researcher ran a median test on each stakeholder, and found that the nine stakeholders significant difference is observed for employees, customers, distributors, and MPOB. However, the problem with this nonparametric test is that it does not allow the researcher to make a conclusive comparison between clusters/groups. In other words it does not show which cluster is significantly different. To determine this the researcher conducted an analysis of variance (ANOVA), with the assumption of normality of the data - the results are shown in Table 7.33.

A one-way ANOVA test was performed, using post-hoc testing. The Bonferroni test showed there was a significance difference between minimalists and proactivists, in terms of at primary stakeholder pressure, at the 0.05 significance level. The latter group (proactivists) perceived more primary stakeholders' pressure than did the low compliance strategy group (minimalists). However no significant difference is observed between companies in the minimalist cluster and the intermediator cluster.

Table 7.32: ***Frequencies and Test Statistics of Median Test of Primary Stakeholders Pressures against Categories of Environmental Strategy Proactiveness.***

Primary Stakeholder		Minimalist	Intermediator	Proactivist	Median	Chi-Square	Sig
Shareholder	> Median	2	0	2	3.75	2.25	0.32
	<= Median	2	2	1			
Financial institutions	> Median	1	1	1	2.25	0.38	0.83
	<= Median	3	1	2			
Insurance companies	> Median	2	1	1	2.00	0.23	0.89
	<= Median	2	1	2			
Employees	> Median	1	0	3	3.75	5.96	0.05*
	<= Median	3	2	0			
Customers	> Median	0	1	3	3.75	6.98	0.03*
	<= Median	4	1	0			
Suppliers	> Median	0	0	2	3.25	5.14	0.08
	<= Median	4	2	1			
Distributor	> Median	1	0	3	2.75	5.96	0.05*
	<= Median	3	2	0			
MPOA	> Median	0	1	2	4.50	3.75	0.15
	<= Median	4	1	1			
MPOB	> Median	0	1	3	4.75	6.98	0.03*
	<= Median	4	1	0			

* The difference is significance at the 0.05 level.
Source: Based on the sample survey (2006)

Table 7.33: Post-Hoc Test (Bonferroni Test) of Primary Stakeholders Pressures against Three Companies Clusters (Environmental Strategies Proactiveness)

Stakeholder	(I)Environmental proactiveness (I)	(J)	Stakeholder pressure Mean difference (I) - (J)	Std. error	Significance
Primary	Minimalist	Intermediator	-0.32	0.43	1.00
		Proactivist	-1.36	0.38	0.04*
	Intermediator	Minimalist	0.32	0.43	1.00
		Proactivist	-1.04	0.46	0.19
	Proactivist	Minimalist	1.36	0.38	0.04*
		Intermediator	1.04	0.46	0.19

*. The mean difference is significant at the 0.05 level.
Source: Based on the sample survey (2006)

Hypothesis 3

Referring back to Table 7.31 results show that of the four minimalists, three companies perceived their secondary stakeholder pressure at levels less than or equal to median, and only one perceived a level greater than median. Both of the two intermediator companies reported secondary stakeholder pressures below or equal to median, while in

contrast with the other categories, all proactivists reported levels above the median. These findings show a noticeable difference between strategies in perception of secondary stakeholder pressure.

This is further clarified by the results of the median test (Table 7.31), as the significance is at the 0.05 level, indicating that there is a significant difference of companies' perception of secondary stakeholder pressure between the three categories of environmental strategy proactiveness. So ***the null hypothesis is rejected and the alternative hypothesis is accepted***.

Again, the researcher performed a median test on each of the secondary stakeholders to determine which secondary stakeholders are perceived as applying pressure differently among the environmental strategy categories, and found all stakeholders showed significant difference at the 0.05 level (Table 7.34).

Table 7.34*: Frequencies and Test Statistics of Median Test of Secondary Stakeholders' Pressures against Categories of Environmental StrategyProactiveness*

Secondary Stakeholder		Minimalist	Intermediator	Proactivist	Median	Chi-Square	Sig
Local community	> Median	1	0	3	3.25	5.96	0.05*
	<= Median	3	2	0			
Media	> Median	1	0	3	4.00	5.96	0.05*
	<= Median	3	2	0			
Competitor	> Median	1	0	3	4.50	5.96	0.05*
	<= Median	3	2	0			
ENGOs	> Median	1	0	3	4.25	5.96	0.05*
	<= Median	3	2	0			

*. The difference is significant at the 0.05 level.
Source: Based on the sample survey (2006)

To determine if is there is any significant difference between these clusters the researcher conducted analysis of variance (ANOVA), again with the assumption of normality of the data (Table 7.35).

A one-way ANOVA test was performed, using post-hoc testing. The Bonferroni test results showed there was a significance difference between minimalists (low compliance companies) and proactivists (high compliance) in terms of secondary stakeholder pressure, at the 0.05 significance level, as shown in Table 7.35. However no

significance difference is observed between proactivists and intermediators and between minimalists and intermediators.

Table 7.35: ***Post-Hoc Test (Bonferroni Test) of Secondary Stakeholders Pressures against Three Companies Clusters (Environmental Strategies Proactiveness)***

Stakeholder	(I) Environmental proactiveness (I)	(J)	Stakeholder pressure Mean difference (I) - (J)	Std. error	Significance
Secondary	Minimalist	Intermediator	-0.48	0.74	1.00
		Proactivist	-2.34	0.65	0.04*
	Intermediator	Minimalist	0.48	0.74	1.00
		Proactivist	-1.86	0.78	0.16
	Proactivist	Minimalist	2.35	0.65	0.04*
		Intermediator	1.86	0.78	0.16

* The difference is significant at the 0.05 level
Source: Based on the sample survey (2006)

Hypothesis 4

Table 7.36 results show that all minimalists companies rated as below or equal to the median in terms of environmental effectiveness measures, in contrast with proactivists where all of the companies rated environmental effectiveness measures above median. As for intermediators, one company was above and one below or equal with median in terms of their environmental effectiveness. This observation showed noticeable differences between proactivists and minimalists in their environmental effectiveness.

Table 7.36: ***Frequencies and Test Statistics of Median Test of Environmental Effectiveness and Competitive Advantage against Category of Environmental Strategy Proactiveness***

		Minimalist	Intermediator	Proactivist	Median	Chi-Square	Sig.
Environmental effectiveness	> Median	0	1	3	5.70	6.98	0.03*
	<= Median	4	1	0			
Competitive advantage	> Median	1	1	2	5.04	1.24	0.54
	<= Median	3	1	1			

* The difference is significant at the 0.05 level
Source: Based on the sample survey (2006)

The median test results in the Table 7.36 shows significance is 0.03, which is less than the 0.05 level, so there is a significant difference of environmental effectiveness

measures among these three environmental strategy proactiveness clusters. Thus, ***the null hypothesis is rejected and the alternative hypothesis is accepted.***

To establish which of environmental effectiveness items is significantly different between the environmental strategy clusters, the researcher performed median tests on each of the items, and found that of the eight environmental effectiveness measures a significant difference is observed for (i) high level of investment in new technology, and (ii) high public environmental disclosure of business to stakeholders. These items showed a difference at the 0.05 level as indicated in Table 7.37.

Table 7.37: ***Frequencies and Test Statistics of Median Test of Environmental Effectiveness against Category of Environmental Proactiveness***

Environmental Effectiveness		Minimalist	Intermediator	Proactivist	Median	Chi-Square	Sig.
Complying with environmental Law	> Median	1	1	2	6.75	1.24	0.54
	<= Median	3	1	1			
High level investment in new technology	> Median	1	0	3	5.50	5.96	0.05*
	<= Median	3	2	0			
Reduced operational cost	> Median	3	0	1	5.25	3.26	0.17
	<= Median	1	2	2			
Few complaints in past 5 years	> Median	0	1	2	6.25	3.75	0.15
	<= Median	4	1	1			
Environmental accidents less in past 5 years	> Median	0	1	2	6.00	3.75	0.15
	<= Median	4	1	1			
Environmental Systems Effective	> Median	0	1	2	5.75	5.14	0.08
	<= Median	4	1	1			
Good relationship With stakeholders	> Median	1	0	2	5.75	2.63	0.27
	<= Median	3	2	1			
High public environmental disclosure	> Median	1	0	3	4.75	5.96	0.05*
	<= Median	3	2	0			

* The difference is significant at the 0.05 level. Source: Based on the sample survey (2006)

Again a one-way ANOVA test was conducted to see significant differences between the company clusters, with normality of the data assumed in conducting the test. In Table

7.38, Bonferroni post-hoc testing shows that proactivists differed significantly from both minimalists and intermediators at the 0.05 significance level. However, no significant difference is observed between minimalists and intermediators.

Table 7.38: ***Post Hoc (Benforroni) Test of Environmental Effectiveness against Three Companies Clusters (Environmental Proactiveness)***

	(I)Environmental. proactiveness		Env. effectiveness Mean difference		
	(I)	(J)	(I) - (J)	Std. error	Significance
Environmental effectiveness	Minimalist	Intermediator	-0.03	0.12	1.00
		Proactivist	-0.57	0.11	0.01*
	Intermediator	Minimalist	0.03	0.12	1.00
		Proactivist	-0.54	0.13	0.02*
	Proactivist	Minimalist	0.57	0.11	0.01*
		Intermediator	0.54	0.13	0.02*

* The difference is significant at the 0.05 level. Source: Based on the sample survey (2006)

Hypothesis 5

Table 7.36 (on page 258) shows that of the four intermediators, three companies have their measures of competitive advantage rated at less than or equal to the median, and only one has competitive advantage rated at more than median. For proactivists, two companies rated above the median, and one lower or equal to the median, whereas, for intermediators, one company rated above the median and one company below or equal to the median in terms of competitive advantage practices. Examination of these results shows no noticeable difference between environmental strategy proactiveness clusters as far as competitive advantage is concerned.

This is further in clarified by the results of the median test. Significance in the test is 0.54 (Table 7.36), which is higher than the 0.05 level, so there is no significant difference of competitive advantage among the three categories of environmental strategy proactiveness. As a result, ***the null hypothesis fails to be rejected***.

Hypothesis 6

To evaluate the effect of the control variables for company's size (that is, plantation size and number of employees of company) on the relationship between stakeholder pressure (average stakeholder pressure) and environmental strategies (average environmental

strategy) the researcher performed a partial correlation (Pearson correlation). In this partial correlation the researcher used zero order correlations as basis of comparison.

The correlation table (Table 7.39) shows both the zero-order correlations (correlation without any control variables) of all three variables, and partial correlation controlling for the effects of plantation area on the correlations. It is observed from the results that zero order correlation between stakeholder pressure and environmental strategies is fairly high 0.77 and statistically significant at 0.05 level.

Table 7.39*: Zero Order Correlation and Partial Correlation between Stakeholders' Pressures and Environmental Strategies using Total Planted Area as Control variable*

Control Variables			Stakeholders' pressure	Strategy	Area
None	Stakeholders' pressure	Correlation	1.00	0.77	0.78
		Sign. (1-tailed)	.	0.01**	0.01**
		df	0	7	7
	Strategy	Correlation		1.00	0.92
		Sign. (1-tailed)		.	0.01**
		Df		0	7
	Area	Correlation			1.00
		Sign. (1-tailed)			.
		df			0
Area	Stakeholders' pressure	Correlation	1.00	0.23	
		Sign. (1-tailed)	.	0.29	
		df	0	6	
	Strategy	Correlation		1.00	
		Sign. (1-tailed)		.	
		df		0	

**Correlation is significant at the 0.01 level (1-tailed).
Source: Based on the sample survey (2006)

On the other hand, the partial (Pearson) correlation control for company size (total planted area) is very low (0.23) and not statistically significant at 0.05 level. Based on this finding it is clear that plantation area of the company does influence the relationship between stakeholder pressure and environmental strategy. This is supported by the observation in the zero-order correlations, where both stakeholder pressure and environmental strategies are significantly correlated with the control variable (i.e. total planted area of oil palms) at a 0.01 significance level.

In terms of the second variable of company's size, the correlation table (Table 7.40) shows both the zero-order correlations of all three variables, and partial correlation controlling for the effects of number of employees on the correlations. The partial

(Pearson) correlation control for company size (number of employees) is very low (0.47) and not statistically significant at 0.05 level. This is in contrast with the zero order correlation between stakeholder pressure and environmental strategies where the correlation is fairly high 0.77, and statistically significant at 0.05 level. Based on this finding it is clear that the number of employees does influence the relationship between stakeholder pressure and environmental strategy. This is further supported by the observation in the zero-order correlations, where both stakeholder pressure (r=0.74, p=0.01) and environmental strategies (r=0.77, p=0.01) are significantly correlated with control variable - number of employees in the company - at 0.01 significance level.

Table 7.40*: Zero Order Correlation and Partial Correlation between Stakeholders' Pressures and Environmental Strategies using Number of Employees as Control variable*

Control Variables			Stakeholders' pressure	Strategy	Employees
None	Stakeholders' pressure	Correlation	1.00	0.77	0.74
		Sign. (1-tailed)	.	0.01**	0.01**
		df	0	7	7
	Strategy	Correlation		1.00	0.77
		Sign. (1-tailed)		.	0.01**
		df		0	7
	Employees	Correlation			1.00
		Sign. (1-tailed)			.
		df			0
Employees	Stakeholders' pressure	Correlation	1.00	0.47	
		Sign.	.	0.18	
		df	0	6	
	Strategy	Correlation		1.00	
		Sign.		.	
		df		0	

**Correlation is significant at the 0.01 level.
Source: Based on the sample survey (2006)

So based on these two tests, ***the null hypothesis is rejected and the alternative hypothesis is accepted.***

Hypothesis 7

The same statistical hypothesis testing was also used to determine the effect of another control variable, that is company's resources (average resources), on the correlation between stakeholder pressure and environmental strategy proactiveness.

Table 7.41 shows both the zero-order correlations (correlation without any control variables) of all three variables and partial (Pearson) correlation controlling for the effects of resources on the correlations between stakeholder pressure and environmental strategy. Zero order correlation between stakeholder pressure and environmental strategies which is fairly high 0.77 and statistically significant at 0.01 level is compared with the partial correlation. The partial correlation control for company's resources is still quite high (0.76) and statistically significant at the same level, 0.01.

Table 7.41: ***Zero Order Correlation and Partial Correlation between Stakeholders' pressures and Environmental Strategies using Company Resources as Control variable***

Control Variables			Stakeholders' pressure	Strategy	Resources
None	Stakeholders' pressure	Correlation	1.00	0.77	0.34
		Sign. (1-tailed)	.	0.01**	0.19
		Df	0	7	7
	Strategy	Correlation		1.00	0.23
		Sign. (1-tailed)		.	0.28
		Df		0	7
	Resources	Correlation			1.00
		Sign. (1-tailed)			.
		df			0
Resources	Stakeholders' pressure	Correlation	1.00	0.76	
		Sign. (1-tailed)	.	0.01**	
		df	0	6	
	Strategy	Correlation		1.00	
		Sign. (1-tailed)		.	
		df		0	

** Correlation is significant at the 0.01 level.
Source: Based on the sample survey (2006)

Based on this finding it is clear that company's resources does not influence the relationship between stakeholder pressure and environmental strategy This is supported by zero-order correlations, where both stakeholder pressure (r=0.34, p=0.19) and environmental strategies (r=0.23. p=0.28) are not significantly correlated with the control variable-of company's resources. Therefore, this test shows that ***the null hypothesis fails to be rejected***.

7.9 Limitations of the Survey Questionnaire

Interpretations of the survey results presented here is subject to a number of limitations. The first limitation of this study is that it involved a small number of palm oil companies - only 9 of the public listed palm oil companies in Malaysia. All of them are

GLCs. This only constituted 25 percent of the population of the study. Due to small sample size and the fact that all of the surveyed companies are GLCs, the study findings could not be used to generalise about the whole palm oil industry. However, this study acts as an exploratory study of corporate environmentalism in Malaysian palm oil companies.

A second limitation identified in the study is that the respondents in the study are more likely to give higher ranked positive answers in relation to the research variables. This is more observable in ratings of the measures of competitive advantage and companies' resources. As a result the data are skewed to the high-end value of the scale. Therefore using the mean of these two variables should be treated with caution.

A third limitation to be considered is the risk involved in converting verbal classification scales into interval scales (Aragon-Correa, 1998 p.564). The procedure adopted in this study follows the usual practice of treating classification scales as interval scales, so they were used as the basis for computing the values of means and standard deviations in SPSS. This is the conventional procedure described by Selltiz, Johada, Deutsch, and Cook (1959 p.367) for using a Likert Scale.

7.10 Summary

In this quantitative analysis three types of environmental strategy proactiveness of the surveyed palm oil companies - minimalist; intermediator; and proactivist - have been identified. This was followed by comparison of environmental stakeholders' pressure, environmental effectiveness, and competitive advantages on each of these environmental strategies. The impact of a company's size and resources on the relationship between environmental strategy proactiveness and stakeholder's pressure were also investigated.

It was found that there is no significant difference in terms of regulatory stakeholders' pressure among these three environmental strategies. Companies in all of the categories showed high pressure from regulatory stakeholders on their environmental strategies. However these three categories of company environmental strategy showed significant difference in terms of perceived threats from both primary and secondary stakeholders.

Overall, as industry leaders in environmental management, proactivists (proactive strategy) perceived wider and more serious threats and pressures from environmental stakeholders. Unlike companies in the reactive categories (minimalist and intermediator), who perceived only regulatory stakeholders as a high pressure group, the proactivists not only perceived regulatory stakeholders but also primary and secondary stakeholders as high pressure groups. Additionally, the analysis showed significant differences in practices related to environmental effectiveness between companies classified in the different types of environmental strategy, where companies in the proactive category showed a high level of environmental effectiveness. However, this is not true for the practices related to competitive advantage, where no difference between the three strategy classifications was observed.

The impact of company's size (number of employees and plantation area) was observable in the relationship between stakeholder's pressure and environmental strategy; but there was no observable impact from company's resources.

While the survey questionnaire can give information about what managers of the surveyed companies perceived in terms of company's resources, stakeholders' pressure, environmental strategies (as the actions taken in response to stakeholders' pressure), the effectiveness of environmental strategies, and measures for competitive advantage, the responses do not answer questions as to why a company's representatives perceived some stakeholders (regulators, primary stakeholders and secondary stakeholders) to exert more pressure on them to be more environmentally responsible. In the following chapter, qualitative data analysis (by means of an in depth interview) will provide further insights into the corporate environmentalism of palm oil companies. In addition, the qualitative data analysis (in depth interviews with both management of palm oil companies and their stakeholders) helps to validate the categorisation of each company's environmental strategies that occurred in the quantitative analysis.

Chapter Eight

Qualitative Analysis and Findings - Palm Oil Companies

8.1 Introduction

This chapter analyses thirty six transcripts of interviews of managers from nine palm oil companies. The first part is a general overview of a range of issues impacting the MPOI as seen by the study participants. It considers the industry challenges and issues of sustainability. This is followed by investigation of environmental practices at the studied companies' operational, tactical and strategic levels. The purpose of such an investigation is to determine what type of environmental strategy is adopted in each firm, in order to develop a typology of environmental strategies. This can be used to validate each company's environmental strategy as discussed in the previous chapter (quantitative analysis). In relation to this, how each typology relates to perceptions of stakeholders' pressure, its relationship with environmental effectiveness, and with competitive advantages will also be examined. Moreover, barriers to improvement and ways to improve corporate environmentalism in the industry are also discussed. Results of this qualitative analysis are by no means exhaustive, however due to the sheer volume of quotes making up the study, a representative sampling of only one or two relevant quotes will punctuate the results.

8.2 Challenges in the Malaysian Palm Oil Industry

8.2.1 General Challenges

Two types of general challenges were identified as being faced by the industry: - high order and low order responses are shown in Table 8.1. Overall, there were three high order responses to the question of MPOI's challenges. The foremost challenge is the continually increasing operational cost in production of both estate and mill operations, albeit that the problem seemed more crucial in the oil palm estates. According to participants, increasing price of materials, especially inorganic fertilizer, and increasing labour costs, including salary, and legislative issues by which more expensive and stringent requirements have been imposed by the government to acquire foreign

labourers, have contributed to rising operational costs. The second high order challenge is the fluctuations in palm oil price in the international market, which is dictated by demand and supply of the oil. Instability of palm oil price affects the profits of industry players and also influences companies' planning for expansion. The third high order challenge is to maintain and/ or to increase productivity i.e. yield of FFB per hectare in plantations, as well as oil extraction rate (OER) for a mill. For example, the plantation director of company B lamented this problem when he mentioned his plantation yield has been stagnant over the last five years. A day later, during the visit to one of his mills, his mill manager told the researcher that the mill's OER that day was below his company's standard and he added that he would be answerable as to why his mill fails to achieve the company's target.

Table 8.1: ***General Challenges faced by the MPOI***

High order response	Low order response
i. Increasing operational costs in estate and mill	i. Slow technological advancement in the industry
ii. Fluctuation of palm oil price in the international market	ii. Competition from palm oil producers, notably Indonesia
iii. Maintaining productivity in estates	iii. Limited suitable land for oil palm expansion in Malaysia
	iv. Difficulty in attracting local employees to work in plantation.
	v. Competition from other vegetable oils, mainly soybean oil.

Source: Based on the researcher's Interview (2006)

Besides these three major challenges highlighted by most respondents, another five low order responses were highlighted. First, the slow technological advancement in plantations and palm oil mills alike is an issue. While a plantation needs mechanization, especially harvesting machines, in order to reduce dependence on labour, currently most palm oil companies rely on traditional techniques of using a sickle with a long pole to harvest oil palm fruit. The only significant change that has been observed is the replacement of bamboo with steel poles. Although machines have been developed for harvesting, these have been found too costly and not practical enough to use in hilly areas. Also, modernising a conventional method of production of crude palm oil in palm oil mills is a further challenge. According to a number of mill managers, current

techniques of using mechanical pressing to extract crude palm oil were developed in the 1940s, and are still used, with some minor changes to increase efficiency.

A further challenge, according to interviewees, was fierce competition from other palm oil producers, especially Indonesia who have advantages in land banks and cheaper labour resources. A limited area of suitable land for palm oil expansion in Malaysia and difficulty of attracting local employees to work in plantations and at management level were also in the list of challenges for the industry. The younger generation perceives the industry as less attractive. As a result, Malaysia is dangerously dependent on foreign labourers, mainly Indonesians. As well, competition with other producers of palm oil, and from the rival industries of other vegetables oil, notably soybean, was mentioned..

8.2.2 Environmental Challenges

In terms of environmental challenges, participants in general gave two responses. More than half admitted that there were some environmental issues exacerbated by the industry. But some denied any environmental impacts. For the former,water pollution was considered the main impact. Apart from that were soil erosion, open burning, smoke emissions and deforestation. As for the remainder of respondents, they argued that the industry was environmentally friendly and doing well for the environment. 'In fact we help the environment', said the palm oil estate manager of company C. He cited cover crop practice to reduce soil erosion in the plantation as an example.

8.3 Sustainability of the Malaysian Palm Oil industry

The respondents in the study gave two different comments on the sustainability of the MPOI - economic and environmental sustainability. In terms of economic sustainability, all respondents were optimistic and believed the industry would be sustainable in the future. They argued that although the MPOI faces a strong competition from Indonesian (as the country has both advantages in land availability and cheap labour resources), the MPOI could compete because it had other advantages. First, oil palm estates in Malaysia produce higher yields per hectare than those in Indonesia. Second, its estates produce a better quality of palm oil. Third, as far as technology in the palm oil industry is concerned, Malaysia is still far ahead in oil palm tissue culture to produce high yield

fruits, usage of mechanization, and advances in research and development (R&D). This was what a palm oil mill manager of company C said:

> [The] Palm oil industry is not sunset business. Although we face strong competition from Indonesia, now we ahead Indonesia. Even their acreage will be more, that will not be a problem, we transfer our technology to them, because we are pioneer, why we need to be afraid?…. We go for efficiency, but Indonesia goes for acreage. Perhaps 100 acres in Indonesia, ours only 30 acres.

The general manager of company B had the same feeling about the MPOI's competitiveness against its main rival.

> [T]here is competition with our competitors. What we must do now, Malaysia must increase yield per hectare. For our company we are planting XX500 (high quality breed of oil palm), last time we planted XX400. Now with XX500 we can produce around 13 to 15 tonnes per hectare and OER (Oil extraction rate) more than 25. So it means to say, although our neighbour (Indonesia) has land bank but (sic) we have technology in producing better crops, better yield and high OER (Oil extraction rate).

Fourth, more and more big Malaysian palm oil companies have invested in Indonesia since the late 1990s, which could cushion the impact of the threat. In fact, some respondents perceived Indonesia as Malaysia's 'younger brother' who can work together with Malaysia for mutual profits. From a historical perspective oil palms were first planted in Indonesia and then came to Malaysia, said the general manager of company F.

Some respondents were optimistic, because as a food based product there will be always demand for palm oil. An increasing size of the populations in developing countries, especially China and India, in the near future would guarantee a sustainable demand. 'Because when you're talking about oil palm you talking about foods' and 'everyday how many babies born in this world, if I not mistaken 30,000 per second…. human they need food' said the general manager of company G.

Moreover, use of palm oil is not only limited to food and food-based products; other products such as soap, oleo-chemicals and, most recently the use of palm oil to produce bio-diesel fuel, boosts the confidence of respondents on palm oil sustainability. As the same general manager of company G went on:

> [F]rom my opinion bio-diesel can stabilise the price. Because for non-renewable fuel, carbon based fuel is getting shortage in the future, so one day we will shift

> to alternative energy. And then palm oil is more environmentally friendly, and the advantage is there.

As with economic sustainability, overwhelmingly respondents claimed the MPOI is environmentally sustainable. Reasons for such arguments revolved around a number of environmentally friendly practices of the industry, including soil erosion prevention, zero burning practices, reduction of palm oil mill effluent (POME) discharge into water courses, reduced usage of chemicals, and controlled air emission, all of which are widely practised by the industry. What the environmental officer of company D thought was:

> We have good agricultural practices (GAP). Meaning that, when we established (new plantation), we do replanting for example, we cut down trees, we do chipping, there is no open burning, we have zero burning policy, another thing we reduced usage of fertilizer when we chipped oil palms' trunk off. After that, we plant leguminous cover crops to reduce (erosion on) bare land, it means when oil palm trees growing soil will be covered, not leave it as a barren land. So when it rains no erosion occurs. So far we are (environmentally) sustainable.

In addition, a number of estate managers argued that although some forested areas have to be cleared for oil palm crops, the loss of forest was minimised with oil palms compared to other crops, because of the high oil yield per hectare compared to low-yield crops of soybeans. Moreover, they argued that oil palms are perennial crops that can be replanted on the same land after the palms have reached twenty to twenty five years old.

Despite all these opinions, respondents failed to argue convincingly that the industry was not responsible for the deforestation of Malaysian tropical rain forests, and endangering wildlife that depend on the existence of these forests as a means of survival. The Orang Utan problem in Sabah and Sarawak is a case in point. These two issues have been major criticisms of the industry by ENGOs and their proponents since the 1990s.

8.4 Threat and/or Opportunity from Environmental Issues

When the question of whether environmental issues are a threat or opportunity was presented to them, by and large respondents perceived both points of view as applying. The senior general manager of company B said: 'I think you can look in two angles, threats and also opportunities…If you do not comply, you will be punished, but to comply especially for small companies they need a lot of fund, and cost production will be high.'

The regional manager of company F supported his counterpart when he said: 'It can be both ways, compliance can kill the industry, it can bring up the industry. We got the pros and cons.'

Amongst the opportunities related to environmental issues mentioned during the interviews were:

(i) Market opportunities; firstly, as a special producer, by becoming Euro-Retailer Produce Good Agricultural Practices (EurepGAP) and/or ISO 14000 certified companies. It was considered as a differentiating factor to market palm oil from an environmentally friendly company. Secondly there is also a market for by-products, such as the sludge of POME, which is used to produce fertilizer. Thirdly there is also a potential market for bio-gas, with a number of palm oil companies talking about partnering with EU companies to tap methane from POME ponds. Through this type of joint venture the company is entitled to claim carbon tax credits from the EU. However, the project is still at the discussion table. Environmentally friendly companies have a better opportunity to attract an EU partner for this kind of project.

(ii) Positive reputation from shareholders - environmentally friendly companies will attract new shareholders to invest in their companies.

(iii) Good image presented to customers and other stakeholders such as the RSPO.

Although respondents perceived both opportunities and threats, in general they believed there were more threats rather than opportunities arising from environmental issues. The threats that were talked about were:

(i) Threats from regulatory stakeholders; failure to comply with the environmental law subjects palm oil companies to prosecution and if found guilty they would be punished. If palm oil companies spend more money to comply however, this would affect their financial bottom line.

(ii) Voluntary systems, such as ISO 14000 certification, seem simply to provide assurance, but are actually not a strategy to overcome the problems with ENGOs.

(iii) Threat from competitors. If environmental regulations force Malaysian companies to comply with the law, this would incur specific costs. As a result, overall operational costs would be higher, while in contrast competitors in other countries with low operational costs would gain competitively. Buyers generally would buy from these competitors instead of from Malaysian companies. The senior general manager of company F argued that:

> [T]o comply it involves cost, they (competitors) can maintain low production (cost). If we sell at the same market price, they make more profit. Because the margin, they can give discount. So what happen? They kill. Even you as a buyer you go for cheaper one, right! If I give you (less) 50 dollar a tonne, will you buy from me if you buy 1,000 tonnes, differences 50,000 dollar. Buy from Indonesia or Malaysia, where India will buy CPO (crude palm oil)? India will buy from cheaper producer, because of one million tonne. We are talking about a lot of money.

8.5 Palm Oil Companies' Environmental Strategies

This section has two purposes. First, to probe into more detail about the particular environmental practices within the surveyed companies, in terms of their environmental strategies at the three different levels: operational, tactical and strategic. Second, to develop a typology of the companies' use of environmental strategies based on the interviews with respective company representatives. By so doing each company's environmental strategy classification (or strategy proactiveness category), based on the cluster analysis of research data described in Chapter 7, can be validated. Moreover,

such a typology helps to explain whether there is any relationship between each strategic proactiveness category and stakeholder's pressure, environmental effectiveness, or competitive advantages.

The interviews with respondents presented a range of environmental strategies that have been adopted by the companies. As with the quantitative analysis the companies' overall environmental strategies, as described in the interviews, were grouped into three categories: Proactivist, Intermediator and Minimalist. The operational, tactical and strategic level practices that led to the above classifications will be discussed in turn.

8.5.1 Operational Level Strategy

Operational level strategy was examined along nine dimensions. Participants were asked to explain environmental initiatives taken by their companies in the areas of: reduction of utilities, recycling activities, reduced usage of chemicals, marketing of waste and by-products, new production processes for increasing OER, investment on POME treatment, controlling air pollution, and reduction of the impact of plantations of flora and fauna.

8.5.1.1 High Level Environmental Practices in Operational Strategy

a) Recycling waste materials (empty fruit bunches [EFB], oil palm leaves, shells and fibres).

According to the interviews it is a standard practice of palm oil companies to recycle/reuse waste materials like oil palm leaves, EFB, shells and fibres. In plantations both oil palm fronds and leaves are usually arranged between the oil palm trees to allow them to decompose naturally to supply fertilizer to plantation soil. In addition EFB from palm oil mills are returned back to oil palm plantations to increase organic fertilizers. Respondents of Companies B, D and F reported that they produced bio-compost fertilizer for their estates. According to the plantations director of company B instead of applying EFB directly at the estates, they carry out composting. In his mills in Sabah and Sarawak, after being stripped for the production of palm oil, the EFB are heated and then they are combined with POME and enzymes to produce bio-compost, to be

returned for application back on the plantations. Besides the existing composting plant, company B was also planning to develop another three composting plants, he continued.

In another recycling practice in palm oil mills, oil palm fibre and shells (by-products of palm oil extraction) are usually used as boiler bio-fuel, being burned to produce steam to generate electricity and to run the turbines. According to the mill manager of company F, his mills both used shells and fibre at a ratio of 80 percent and 20 percent respectively. Given the availability of adequate quantities of oil palm fibres and shells for use as solid fuel in the steam boilers, palm oil mills are generally self-sufficient in terms of energy requirement for FFB processing.

b) Reduced usage of electricity and fuel.

In the palm oil industry, a palm oil mill is fairly self-sufficient in generating electricity as it utilises the continuous supply of oil palm fibres and shells. As a result it uses little carbon fuel, some of the mills have tried to reduce even that small amount of diesel consumption. In order to do so, the deputy group engineer of company E said his company mills burned shells and fibres as fast as possible to get more electricity, and managed to reduce diesel usage by between 5 to 10 percent. In addition, according to the plantations director of company B his company is in the process of constructing a POME Biogas Power Generation Plant in one of its mills in Selangor. With this system the biogas (methane) produced from the POME treatment plant could be utilised as fuel for boilers, and to generate power for micro turbines. The two projects have been approved by the Ministry of Natural Resources and Environment and the projects are expected to be registered under the Clean Development Mechanism (CDM) with cooperation from the Danish Government.

In the industry, the main activity that significantly consumes diesel is use of machines for infield collection of fruit bunches and transport to palm oil mills, and transporting EFB back to plantations. In order to reduce diesel use, a number of collecting points at suitable places along the plantation corridors are established to minimise the distance travelled by vehicles. Such a practice is not uncommon in the oil palm plantations, and for many interviewees such a practice was the best means they could use to minimise usage of fuel. Unlike other companies, to further reduce diesel consumption, the estate

manager of company C said that his estate had introduced a new system that reduced the usage of machines to transport FFB to a nearby mill. He elaborated that previously they had used a crane system, in which one crane was used to uplift FFB and another one transported FFB to the mill. Where two machines had previously been involved, in a new technique they use a system that means no longer using a crane for transport. He built many small platforms along the plantation corridors, and a trailer is used to transport FFB to his mill. He proudly said due to this new crane-free system the company had managed to reduce use of diesel by two percent.

c) Reduced chemicals usage (fertilizer and pesticides)

In palm oil plantations, usage of chemicals is the second highest operation cost after labour costs. Since the recent increase in oil prices has caused a doubling of fertilizer and chemicals prices, it does not come as a surprise to see management pay more consideration to this area. From the interviews it was clear that it is a universal practice of oil palm plantations to utilise IPM to control pests in their plantations. IPM involves the use of a combination of suitable techniques and methods of pest control to reduce pest levels to below those causing economic injury. Examples given by respondents include the use of barn owls for controlling rats, and the propagation of beneficial plants to encourage the proliferation of the natural enemies of oil palm pests such as bagworms and nettle caterpillars. The following quotes are typical for all companies.

> As for IPM (Integrated Pest Management) we use less chemical. When you enter our estate you see on the road side various flowery plants, all beneficial plants, that plants provide nectar to the natural predators. Predators come here and then go to our oil palms and eat those worms (bagworms). That's all biological control. *(The plantations director of company B)*

> [E]ven though our palms are matured we don't use blanket spray, only when necessary, after that we plant beneficial plants, so that what we follow, after that (we use) barn owls as biological control, to reduce usage of chemicals that what we do. …….to control rats we use barn owls, one barn covers for 10 hectares.
> *(The plantation director of company H)*

In order to reduce usage of inorganic fertilizer companies in the study applied the following techniques. By-products from palm oil mills, especially EFB, are used as organic fertilizers. And in some companies treated POME (BOD 5000ppm) is applied directly at plantations as on-land forming organic fertilizer. In addition, during replanting, old palm tree trunks and leaves are left in the field to decompose naturally as

a source of fertilizer. Utilisation of legume cover crops such as *Mucuna bracteata* could provide nitrogen to palms, as well as reducing soil erosion. Nevertheless, according to many palm oil estates respondents, in the plantations it is impossible not to use inorganic fertilizers. So as well as increasing the use of organic fertilizers, companies also increase efficient usage of inorganic fertilizer through mechanical spreaders where possible, in order to minimise losses of applied nutrients. Moreover, a number of companies introduced focal application processes by which inorganic fertilizer is placed on the high roots area to increase the efficient usage of such fertilizer.

d) Production processes/management to increase oil extraction

In terms of the introduction of new production processes to increase palm oil mill oil extraction rate (OER) not much technological advancement has been achieved in the industry. For example, the deputy group engineer of company E admitted this when he said: 'Right now the system is quite conventional, the technology is not much breakthrough. Although there are some improvements here and there.' The deputy group engineer of company E's views were also shared by the group engineer of company G who said:

> Technology for palm oil extraction not change very much. There are some new ideas but very expensive. For example, like membrane fibre, membrane extraction but it very costly, it very expensive. But for company we need to look at the bottom line. If we process, and bottom line reduces, its margin will be low. It is no point to do so, whereas with the old techniques we can gain more margins.

However, despite this low technological advancement all palm oil companies in the study were very concerned about their palm oil extraction rate, and ensure that their extraction rates achieved their own target. This is one of main tasks of every palm oil mill manager. Among common techniques to increase oil extraction is the introduction of high oil yield species as well as stringent control of crop quality. Only ripe fruits are harvested, and they must be delivered to palm oil mills as soon as possible for the best possible results.

e) Investment in cleaner palm oil mill effluent and reduced air emissions

(i) Palm oil mill effluent (POME) treatment

When the question was asked about each company's investment in new and cleaner palm oil effluent treatment, there were two main responses given by respondents. First they reported that they had spent a lot of money in establishing new treatment plants for better treatment and second, that they had spent a lot of money on maintaining existing ponds.

According to the assistant manager of a mill in company C, his company spent up to RM 2 million a couple of years ago to establish more ponds to ensure that his mill complied with the DOE requirement. Unlike the rest of the mills described in the interviews, which use a ponding system for treatment, the mill manager of company B said his company used an anaerobic digester plant for POME treatment because it was more efficient. But he admitted the digester was more expensive compared to the conventional ponding system. For example, a single tank digester of 50 metric tonnes cost the company RM 350,000, and for 2,000 metric tonne of POME he needed 4 digester tanks. Furthermore his palm oil mill also had contingency planning to cope with excessive POME during peak crop season as well as during the raining season. As he put it:

> In our mill we have standby strategy, we have different with others … evacuation is done by tanker to send solid to estate, and during peak season where tanker can't cope we have one more system, furrow system. We do it ourselves, but we got approval from DOE. So this … the furrow system near by field, so if POME can't cope, we will pump directly to furrow system.

Together with establishing new treatment plants, a lot of money had also been spent maintaining the efficiency of existing ponds. The general manager (mill operations) for company F was one of many who claimed his company made high investment in POME treatment; and he said enthusiastically about it:

> [W]e spend a lot of money, getting done our effluent system. In fact we have a few mills doing anaerobic, we simplify it, but we don't declare it. Per mill we are talking about RM 15,000 to RM100,000. That is for initial cost. We also have special allocation for the environment like de-sludging.

When the researcher raised a question of the latest available technology to other mill managers, they were quite pessimistic. 'It is available, but it is not time proven, and

cannot consistently achieved BOD that is why we still searching around for the better technology', said the deputy group engineer of company C.

(ii) Control and reduction of palm oil mill air emissions

As with the investment in POME treatment, most respondents claimed their companies had made significant investment in buying new boilers, changing cyclone filters and increasing mill's chimney in order to reduce palm oil mill emission. The following are three related quotes:

> [I]f we talk about environmentally friendly from perspective of palm oil mill, activities like combustion in boiler, cooking fruits, if you see we do control boiler combustion, and available systems in it, inline with efficient combustion…..we use cyclone or back filter to be more confident. These involve a lot of cost, very high cost.
>
> *(The palm oil mill manager of company B)*

> Actually for the last few years we are spending (RM) 3 to 4 million buying boiler, buying new high performance boiler. So that we can reduce emission because new boilers you can't see smoke, seems not operating, but running.
>
> *(The group engineer of company G)*

f) Controlled open burning

Overwhelmingly respondents in the study admitted that they had practised zero open burning techniques in their replanting programmes since the 1990s. They added that such a practice has been adopted as a standard practice within all palm oil companies in Malaysia.

> [W]hen we want to open up (plantation) we couldn't burn, difficult, incur some cost, but we become accustom to it, we have to follow, and that required discipline. We have to follow to survive…if you burned, you got to pay fine.
>
> *(The estate manager of company G)*

Amongst these companies, company B was first to exercise zero burning techniques in its replanting programme. Since 1989 the company has utilised this practice and in 1992 was conferred the international award by an international organisation in recognition of its eco-friendly burning techniques.

g) Reduced soil erosion

According to most interviewees planting of leguminous cover crops had been a standard practice of the industry in reducing the occurrence of soil erosion, by which losses of

nutrients could be minimised. A leguminous cover crop from species of *Mucuna bracteata* has been widely adopted by the MPOI. On the other hand, on steep terrains, terrace construction, pits and banks have been a standard practice of palm oil companies to further mitigate the problem of soil erosion. For companies B, F, G and H and I, their management said that they had started planting timber species, for example Teak and Sertang, to reduce erosion as well as being a source of income.

h) Environmental Impact Assessment (EIA)

According to respondents when they opened up new plantations of more than 500 hectares, they have submitted EIA reports, in which potentially adverse impacts (social and environmental) were identified, and mitigation measures were incorporated through an environmental management plan. Once the companies had established their plantations, reported the respondents, periodic environmental monitoring would be carried out and reported to the DOE to ensure a good environmental performance had been implemented. During the interviews, two respondents, the group engineer and the planting advisor of company G, showed the researcher their company's EIA reports of a new plantation.

8.5.1.2 Low Level Environmental Practices in Operational Strategy

While the above practices of operational strategy have gained more attention and are widely practised amongst palm oil companies, other practices like water recycling, use of eco-friendly materials, creating a market for waste, and reduced impacts of plantation activities on flora and fauna were least exercised.

a) Recycling water and used engine oil.

Of all nine companies, only the mill manager of company B convincingly claimed his mill exercised water recycling. In his mill water was reused to cleanse machinery and not for processing FFB. As for the other companies, no water recycling was practised. One plausible reason for this is that water is very cheap compared to electricity and carbon fuel. In Malaysia palm oil mills are usually established close to rivers and with a simple treatment the water is ready for use in palm oil processing. Although the quantity of water use is high - one tonne of water for one tonne of FFB - that is usually not a

problem. The water recycling practice in the mill of company B was an isolated case in the study. The researcher suspected that such a practice was exercised because, unlike other mills, company B mill buys water from a local utility company because it cannot treat river water cheaply since the mill has been established in brackish water area.

Besides water recycling, another area of recycling which is not commonly practised is the reuse of used-oil. Out of 36 interviews only two respondents, the mill manager of company C and the assistant mill manager of company H, claimed they utilised used-engine oil for chainsaws.

b) Use of eco-friendly materials

When a question of use of eco-friendly materials was asked, none of respondents could relate such a practice in their organisations. Instead they asked the researcher to give them an example. The researcher mentioned using environmentally friendly (biodegradable) polyester bags for growing young palms in nurseries, when they moved these young palms to transplant in their plantations. However, none of them practised this measure.

c) Create a market for waste products

A small number of respondents claimed they created a market for waste. For example, the palm oil mill manager of company C said there was a businessman who regularly came to his mill to buy oil palm shells to make printing toner. As for company D their respondents reported that they sold slurry from their palm oil mill to a bio-compost company, in which the palm oil company is one of the major shareholders, and will buy back bio-compost to apply on its estates.

d) Reduced impact of plantation activities on flora and fauna

When the researcher raised the question of reduced impact of plantation activities on flora and fauna, only a few respondents were able to relate it to their strategies. Company B's plantations director claimed that for his new plantation in Sarawak (but not on the established plantations in both Peninsular Malaysia and Sarawak) the organisation has established a buffer zone, of 500 metres from the river, and the area is untouched. The company also planted timber trees, especially teak, on steep land. The

last practice was also mentioned by respondents from companies G, H and I. But for the remainder of the respondents, most of them admitted they did not reserve a pocket of their plantation area for forest. And for both companies D and E, their representatives claimed that their plantations have low or little impact on flora and fauna since their plantations were established from replanting of rubber and old palm plantations.

None of these companies voluntarily avoid opening up plantations in areas of high negative ecological impacts. For example, all of the representatives from company H admitted that their company had already developed plantations in a sensitive area, that is the peat soil regions in Sarawak. Instead of exercising restraint in terms of such a practice, the company looked forward to expanding its oil palm plantations if their company is given the same type of land in the future, they said. When the researcher asked the company representatives about the impact on fauna by opening up such palm oil plantations, one of them, the estate manager of company H, argued that the Malaysian government already allocated enough forest reserves for wildlife, and that such environmental concerns are not his company's responsibility to shoulder, and that there is little his company can do about it. In his estates he erected fences to keep away wild animals and if they enter their estates they chase them away or report the situation to the wildlife department. For him the matter largely depends on the authority and he left it to the relevant authorities. Once land is allocated by the government, the company would develop the area with little or no concern for wildlife. As he argued:

> Elephants normally have their tracks, but the government more knowledgeable, the government knows, that is why we have forest reserves. Gazetted as forest reserves. Normally when we open up any area, the government know that area not forest reserve. That's what is happening, if elephants enter and all that, perhaps they out of track. Normally we will report to PERHILITAN (Wildlife Department), they will be transferred to forest reserve. Because the government normally decided, we can't just open up forest area on our own, no. They will decide, not in forest reserve, we open up our plantation only in area permitted by the government.

A comment of a similar tone was also made by the estate manager of company G (who worked with the Forestry Department before he joined the palm oil company) when he said:

> You ask me this question, I'm the forester you know (as well as) planter, we must strike a balance, we have Endau-Rompin Park and the National Park, there we placed our animals, at the same time we need to open up the area for human too for (our) benefits. For jungle clearing you can't see animals' carcass

> lying down, no! Animals will move to vicinity forests, next to our plantation, they survived, so we need to strike a balance.

8.5.2 Tactical Level Strategy

In tactical level strategy, respondents were asked about six dimensions of environmental management which included: companies' environmental efforts to increase green supply chains of suppliers/contractors and encouraging distributors environmental practices, Environmental Management Systems (EMS), product life cycle assessment, company's role in environmental management in the industry such as membership of the RSPO, and publication of environmental management policies.

a) Environmental criteria to include or exclude suppliers/contractors

In the case of suppliers, all the companies admitted they chose suppliers not on their environmental track record, but more on price and quality of goods and/ or services they provided. The same could be said for contractors. According to respondents they were chosen according to their competitive tender and their performance records, and their environmental records gained no special merit from these companies. When the researcher asked why they did not look at their suppliers or contractors' environmental performance record, first they said they could not evaluate them harshly, and second, that it was not their responsibility to know other companies environmental practices. Nevertheless, almost half of respondents claimed that once they chose contractors, they closely monitored their performance in order to ensure they did not violate any environmental laws. As the estate manager of company A put it:

> We need to monitor our contractor, we has an agreement. If anything happen which involves open burning, if caught, it (the contractor) must be responsible. Because we already have (the) agreement, we already gave guideline what are do's and don'ts. As far as I'm concerned our contractor will be prosecuted not us if any violation of laws occurred, not upon us. Because that job is based on turnkey basis, so in 3 or 4 years, that project (felling and replanting oil palms) under our contractor. And then in the fifth year, it will hand in to us.

Although none had made selection of their suppliers or contractors based on their environmental records, it is interesting to observe that the mill manager of company F explained that due to requirements of ISO 14000 and Hazard Analysis and Critical Control Point (HACCP) certification, his mill had to encourage environmentalism

among its contractors, and train them on certain aspects of his company's environmental criteria, in order to facilitate their work. This was what he said:

> Actually ISO 14001 doesn't stress on supplier environmental management, but what we stress more on contractor who doing their job in our mill. It means we need to give (them) training. How our policy? What we are going to achieve? They must comply with what we want, because they do their job for us. But under food safety it really stress, indeed, what they need to comply, for example if we want to sell scheduled waste, we need to see their licence, it is a compliant, regulatory requirement for transporters and depositor of scheduled waste.

b) Encouraging distributors to increase their environmental practices.

Analysing the interviews it was found none of the companies make an effort to increase their distributors' environmental practices.

c) Environmental Management System (ISO 14000 Certification).

Of all the nine companies under the study, at least one mill in each of companies B, D, E, F and H had been ISO 14000 certified. Company B was considered as a leader in the ISO 14000 certification since five of their palm oil mills were certified. Company D followed, with two of its mills being ISO certified. In addition one of company D's estates is certified with ISO 14000, making it one of the first palm oil estates in Malaysia to have received such environmental certification.

Besides ISO 14000, company B had established its own certification standard with integrated quality measure, an occupational safety and health committee (OSHC) and environmental management system. In June 2006 six estates and three mills received the certification. According to its plantation director in two to three year's time all mills under his management will be endorsed by the certification. Company F also followed a similar approach to company B, since according to their general manager (also the head of the quality unit) his organisation would not pursue additional ISO 14000 certification, instead his organisation would concentrate more on the international good agricultural practices (GAP) and the hazard analysis (HACCP) certifications. Both certificates he believed to be more comprehensive in that they cover all aspect of environmental management under ISO 14000, in addition to food safety aspects. During the interview, he disclosed that three of the company's mills had GAP certification. He added that in 2006 altogether four of his units were still pending for the certificate, and

another five would follow suit in 2007. He summed up 'by the end of 2008 all mills will be either certified by XXXX or ZZZZ.'

Unlike with the companies mentioned above, companies E and H did not have a clear plan to increase numbers of ISO 14000 certified mills and seemed satisfied with one mill being accredited. This was evident when the interviewer posed such a question, and while the respondents mentioned their company's intention to undertake such certification in the future, they could not tell with any certainty which mills, or when they would go forward with such plans.

As for companies A, C, G, and I, in which none of their palm oil mills and estates are ISO 14000 certified, when the researcher asked if they had any intention to apply for the certification, representatives of companies A and G said yes, but companies C and I replied no. For companies A and G, who had the intention to seek accreditation, they were still studying the process; they would look at the benefits of doing so, and probably they would go for it in the future. However, in the end, the decision would come from the top management, they said. On the contrary, for the other two, companies C and I, none of the respondents said their top management showed any interest or talked about it. One respondent (the mill manager of company C) seemed deeply pessimistic about the real environmental benefits of getting ISO 14000 certification:

> Quality for me (only) make-up, the actual thing is simple….our awareness. Is we really need ISO 14000?... that only for system, that's it. Because I was from a mill ISO 14000 certified. What it got from ISO 14000? Only a system, it is a fake.

This is a paradox as he was once working as the assistant manager at one of ISO 14000 certified palm oil mills of company D before working as the palm oil mill manager of company C.

d) Evaluate the Life Cycle of Palm Oil Product

In terms of attempts made to evaluate the life cycle of palm oil product, out of the nine companies, only company B carries out this practice, through what it called a 'traceability' programme by which the company can trace from which plantation its crude palm oil came:

> Traceability, we can trace, if this oil where it comes, from which estate, from which field. It means if this batch of fruits has quality problem, we can trace. At our estate we mark at stalk, numbering by our harvesters. …..In fact if you go to our plantation right now, it starts from the workers, the workers cut the bunches, they mark the number on the bunches, they put date, harvesters' name, which estates, so if there any problems related to fruit bunches, we can check back from which estates, who are these people. If OER below target, or something wrong with it, we call these people, by doing back you can go back to the field. *(The plantation director of company B)*

For company B, traceability of a palm oil mill's activities is part of the company traceability information process flow where, since 2003, it has an onboard online information system, enabling the company to track and monitor production, sales, shipping and delivery of palm oil and palm oil based products throughout the oil and fats supply chain.

e) The Round Table for Sustainable Palm Oil (RSPO)

Of the nine companies, five companies B, D, E, F and G, were active members of the Roundtable on Sustainable Palm Oil (RSPO). In 2004 all these companies with the exception of the company A became some of the founding members of the RSPO and signatories of the organisation's Statement of Intent (SOI). '[O]ur company is part of, one member of signatories to link ourselves what we called the RSPO', said the general manager of company F. The SOI is a non-legally binding expression of support for RSPO in which the signatories recognise the RSPO's roles towards sustainable palm oil production. Sustainable production takes into consideration the natural environment and social factors, and progress must be made to produce more palm oil sustainably to make sure that the expansion of palm oil plantations will take place on lands that do not have high conservation values.

f) Published environmental policies

Studying the interviews, the researcher found that companies B, D, F and H had their own environmental policies. For example, the plantations director of company B said:

> Our environmental policies are: we establish and maintain environment, eliminate any adverse environmental impact arising from business activities, apply customer satisfactory and train employees to conduct all environmental activities in environmental response manner. This is our (environmental) policy.

Meanwhile, each palm oil mill manager of these four companies said his mills had their own detailed environmental policy. 'Environmental policy, we have objectives, set objectives, aspects and impact analysis', said the mill manager of company B. 'Yes, we have our company environmental policy, our mill also has its own, it more detail, company more general', said the palm oil mill manager of company F. Not surprisingly, these were managers of ISO 14000 certified mills, where one of the requirements for the certification was the establishment of such a policy.

From responses from interviewees of the other companies (A, C, E G and I) it appears that their companies only had general environmental policies, not set out on their own, but as part of their other occupational safety and health policies. The researcher was told by the deputy group engineer of company E that: 'Safety and health policy, we have, environmental policy I think the mills should have their own. The mills would not have it.' Similarly, the assistant palm oil mill manager of company C admitted: 'We have a general policy (referring to the chart on the wall in the meeting room) such as our company policy to comply with safety and health in general, not specific towards the environment.'

8.5.3 Strategic Level Strategy

As far as environmental management practices at strategic level were concerned, respondents of nine companies involved in the study were asked about eleven dimensions of environmental management. They were related to Board of Directors' involvement, long term planning, mission statement, written environmental policy, environmental objectives, those responsible for environmental management, top management involvement, environmental leaders, environmental officers/engineers, environmental performance audit, company's environmental committee, and environmental training for employees.

a) Board of Directors concern about environmental performance

Respondents of all companies with the exception of company I overwhelmingly claimed that their Board of Directors were very concerned over environmental issues and their company's environmental performance. However, when respondents were probed deeply as to what extent and how the board had showed their concern, there were two

distinct types of answers observed. On one hand, representatives from companies A, C, E, G and H could not answer this, instead admitting that their boards paid more attention towards increments in operational cost. Environmental issues were secondary and only given due attention if their company was being caught and/or fined by the authorities for violating environmental regulations.

On the other hand, for companies B, D and F respondents contended that it was a requirement for their management to report any non-compliance to their board. According to the mill manager of company B his CEO sent circulars to all management staff in which the board expressed concern about the company's environmental performance, and clearly stated that for those who managed the mills, they would be the first person responsible for environmental matters. A similar view was echoed by his colleague (the general manager) who stated that since his estate was established in a peat area, the board of directors had sent a team of experts to study the environmental impact issues. Amongst other items the team checked was the occurrence of tides, but that was before the impact of Boxing Day's Tsunami in 2004, he added. Although all these three companies indicated that their Boards of Directors were very concerned about their companies' environmental issues, no any particular individual on the board was in charge; they acted collectively. While these companies' respondents claimed their boards of directors paid attention to their company's environmental performance, as with the rest of the company's activities this must not at the expense of the company's financial bottom line. As a result fewer environmental issues were touched on compared to financial performance measures. The corporate manager of company D summed up:

> They are concerned, basically on the environment, (but) we don't report monthly to the board. Only if there is an investment, or exceptional issue, we will report. They look more on finance, if there is an issue, they will concern. Because they expect management comply, comply (with) all environmental laws.

b) Integration of environmental issues with long term business strategy

There were mixed answers to the question about company's integration of environmental issues into their long term business strategy. For respondents of companies B and F their answers were positive; according to them normally, when they had any projects, environmental issues would come into consideration. So before they

implemented anything new they wanted to see what environmental aspects existed and the impacts of their projects. That was how they integrated environmental issues into their long term environmental strategy. Quite the opposite applied for the rest of companies surveyed; their respondents could not give clear answers on how their company integrated environmental issues with long term business strategy. According to the respondents their companies expect management to comply with existing environmental law, however, it seemed no significant integration of environmental issues was made in terms of their long term business strategy.

c) Written Environmental Mission Statement

Companies B, D and F had written environmental mission statements, but the other companies did not. These three companies had their own specific environmental policies that were dictated by their environmental mission statement. For example, company D has its own environmental policies at corporate level as well as environmental policies at plantation and mill operational level. For example, at plantation level amongst aspects included in its policy were:

1. Comply with Environmental Quality Act, 1974, Pesticide Act 1974, Poison Act 1952, OSH Act 1994 and other applicable regulations and requirement to which the estate subscribe.
2. Prevent pollution and minimise soil erosion, land contamination and other potential adverse environmental impacts arising from the estate operations, products and services that cover from preparation of land, cultivation, manuring, upkeep, harvesting and general administration of the Estate.
3. Strive for continual improvement in environmental performance by adopting ISO 14001 Environmental Management System
4. Use the Environmental Policy to provide the framework for setting and reviewing the environmental objectives and targets on annual basis.
5. The Environmental Policy shall be documented, implemented, maintained and communicated to all employees and persons working on behalf and they are encouraged to conduct their occupational and personal activities in an environmental-responsible manner.
6. The Environmental Policy shall be made available to the public and other interested parties.
7. Review, adopt and implement good management practices through environmental management programme.

As for company H, although it did not have specific environmental policies for its overall operations, the exception was observed for its ISO 14000 certified palm oil mill,

where it had its own environmental policies. This is to be expected, as environmental policy is a requirement for ISO certified palm oil.

None of the rest of the companies - A, C, E, G and I - had any specific environmental mission statement or environmental policy at either corporate or operational level. Most of their respondents claimed their environmental policies were included in Safety and Health Policy. 'We have a general policy such as our company policy is to comply with safety and health in general, not specific towards the environment', the assistant manager of palm oil mill of company C said**.** Similarly, his colleague, the estate manager said when applying pesticides he ensured his employees complied with the OSHA. For him complying with the Act was in fact his estate's policy. It seems clear that for these companies, since they have no environmental policy of their own, what is required by the industry regulations is being used as their guidelines.

d) Environmental Objectives

As far as environmental objectives were concerned respondents of companies B, D and F claimed they had environmental objectives. For example, the manager of the ISO 14000 certified estate of company D described one of his estate's objectives - that in the previous year (2005) his estate set a target to reduce usage of diesel by 2 percent - which was achieved. Such an objective would be continued into the coming year, he added.

But other companies' respondents could not tell the researcher what their companies' environmental objectives were, those objectives they had already achieved, or those objectives they would be achieving in the near future. Nonetheless, most of them claimed that their objectives were in line with requirements from the DOE, and to achieve them they needed to ensure they followed the regulations.

e) Environmental Management Responsibility

There was a mixed response from respondents about who was responsible for environmental management in their organisations. For the majority of the surveyed companies, each of the palm oil mill and oil palm estate managers claimed himself as responsible for environmental management at his respective mill or estate. But in a

number of instances, respondents from companies B, D and F named a head of the Total Quality and Environment Unit of their organisations. As for the plantations director of company B, he reported that the person who was responsible was his chief executive officer (CEO). Other respondents from companies B and C also mentioned their CEOs as those who were responsible for their environmental management. On the other hand, the general manager and corporate manager of company D reported that their environmental officer was responsible for environmental management. In contrast, for some respondents, they 'everybody is responsible,' they said.

f) Involvement of top management

Answers for respondents from company B indicated that the CEO was very committed to his company's environmental management. 'Our top management (is) fully committed on the environment. Our CEO is a chairman of the quality and environmental council, where the council is made up of heads of respective divisions in our organisation including plantation division', said the general manager of company B. The same view was also expressed by his colleague:

> Top management involves in our total quality environmental management system. They will monitor our performance, let say monthly performance including safety and all that (related to) environment. We monitor and then if auditors come, we give feedback to them of what we should be doing.
> *(The estate manager of company B)*

Although respondents for company F claimed their CEO was committed in relation to environmental management, they could not elaborate on any environmental title that he holds.

> He as CEO he looks overall, he establishes company policy related to environment, cascade down to head, GM (general manager), to us at mill. So what he wants, such basically sustainable environmental policy to get new processes, improve our process, and also environmental management, in general, so as down level here we need to find ways which incline with his general objectives. *(The general manager of company F)*

As for both companies D and E, respondents admitted that their top management was concerned about company environmental management, but their top management have no direct involvement in environmental management. For example, holding any environmental title. As the corporate manager of company D said: 'If 1 to 7 scale, I put 7, they are concerned, but they least involved and don't ask report on the environment.'

As for other companies (A, C, E G, H and I,) none of the respondents were able to explain any active involvement of their top management in environmental management. Despite respondents acknowledging their top management concern about their company's environmental management, they were not directly involved in it. Instead they had delegated that function to their subordinate. The answer of the estate manager of company C was typical for this question:

> For me he (CEO) is policy maker, he has high requirement, encourage his subordinates such as staff to go environmental courses and all that. However he doesn't hold any post (related to environment).

g) Environmental Leader

In terms of environmental leaders, company B respondents acknowledged the existence of a dominant leader, as the respondents unanimously voted their Chief Executive Officer as their environmental leader. The plantations director of company B said: 'Our CEO, absolutely him. Anything to do with environment and all that. Actually at management meeting there is (always) one item on environment and safety.'

In company F there were two different responses: both the mill manager and general manager (mill operations in the Northern region) named their CEO. As the latter explained: 'Our group chief executive, if you want to know if he talks about environmental concern alone it will take half day, compliance, introduction in the meeting all involve environmental elements on it.'. However, another general manager (mill operations in the Southern region) chose the head of the quality, environment, safety and technology unit as his company's environmental leader. The head of the unit also considered himself as his company's environmental leader.

Both the estate director and the managing director were considered as company environmental leaders in company D. In company C, one estate manager named his plantation director as environmental leader, but another estate manager could not name any particular environmental leader within the company, while both mill manager and assistant mill manager named the mill manager as their company's environmental leader. For company A, two respondents named their estate manager and the CEO, but for the other two respondents no particular person was considered to be environmental

leader. Two respondents in company I named their managing director and two others named the plantation director.

In the above companies (A, C, D, F and I) various persons ranging from plantation director to chief executive officer were perceived as their company's environmental leaders. This shows existence of environmental leadership in the organisations, but there was no single dominant person. Conversely, in companies E and G respondents claimed no particular person could be considered as environmental leader in their company.

h) Environmental Officer/Environmental Engineer

Except for company D, none of the companies in the study had an environmental officer or engineer. Since most palm oil mill managers are also engineers by training, to have such a position was considered unnecessary and redundant as they themselves could do the job. 'No, we don't have (environmental officer/engineer) because here engineers are responsible for the environment', said the group engineer of company G. They also imagined that if there were an environmental officer, if anything happened at the end of the day they would also be responsible. Added to this, other respondents argued that environmental issues are not a major concern and only involved administration, not finding new techniques, because POME treatment in the industry was well established. They needed just to maintain the practice, they said.

On the other hand, the general manager of company F, who was also head of the quality, environment, science and technology unit, argued that it was enough to have a an occupational safety and health officer. He explained why:

> We have Occupational Safety and health (OSH) certified officer. But for the environment we do not have environmental certified (officer) but we send them all these courses (referring to environmental courses)……. For example, Mr. H (not real name) is certified by DOSH (Department of Safety and Health)…we don't have environmental officer. Because once you have two, their jobs become very limited. What we want are people to know the law. What the law regards to DOE, for example, smoke emission, what is the allowable requirement, Ringelmann Chart and so forth, the dust particulate, thermal energy, or in terms of effluent discharge. What is the BOD? BOD allowable by the government for discharge. These are very important numbers. You don't need to have special degree in the environment because our business is not to cut and fell jungle, we are not hiring environmental impact assessment officer.

Only company D had its own environmental officer, and she was recruited a year ago. According to her, amongst other things her job duties were: first, to ensure that relevant staff of mills and estates know, and comply with, rules and regulations being imposed by the DOE and other related authorities. Second, if there were any cases involving the environment she would take over. She would investigate and write a report to upper management level. During the time that the research interview took place, her task in hand was to complete a RSPO project that covers the legal, social and environmental aspects related to her company.

i) Environmental Audit

For the nine surveyed companies, none of the environmental audits was conducted independently for the overall operations of both estates and palm oil mills. However, the interviews showed that a partial environmental audit might be conducted under two conditions. First it may be part of an operational audit. For example, records of the usage of chemicals in plantations, or the BOD levels at palm oil mill treatment facilities, would be conducted as part of an operational audit of a mill or an estate. Second, an environmental audit would be conducted exclusively for palm oil mills as a requirement for ISO 14000 certification. In company D, since one of its plantations and two of its mills are ISO 14000 certified, an environmental audit according to ISO 14000 procedures were conducted on them. But for the rest of estates and mills, no detailed environmental audits are conducted, and an environmental audit is only part of standard operation procedure (SOP). Similarly, for company E only an operational audit is conducted for its estates and mills. However such an audit was an isolated case, no such audit was reported for non ISO 14000 certificated palm oil mills or estates alike.

As for a SOP audit, both internal parties and external parties conduct the audits. Usually the audit department from each company's headquarters conducts audits on their estates and mills. In terms of external audits, various department agencies such as the Department of Occupational Safety and Heath (DOSH) will conduct audits on estates' and mills' operations under the Occupational Safety and Health Act. An explanation from the planting advisor of company G on audits of his company, was more or less the same as was described for other companies:

> Audit follows government requirement, and audit our SOP (standard operation procedure), Standard proceeding manual, we do own our own. This is for technical, finance and administration not for the environment, perhaps element of the environment in it. All we have, all (for example) if usage of chemical not right we also can check. A bridge which its cost is questionable we can give comment. All, its not only audit our account it's (also) physical. This physical audit under management audit.

On the other hand, for ISO 1400 certified mills, internal auditors from the company's quality and environmental department would first audit its environmental management, followed by an audit by the Standards and Industrial Research Institute of Malaysia (SIRIM) which is the official body that awards the certification in Malaysia.

Respondents of companies B and F also claimed that on a few occasions their refineries in Malaysia and buyers from European countries conducted environmental audits of their palm oil plantations and estates.

Although there was no separate environmental audit conducted by any company (except in the case of ISO 14000 certified mills and estates), any activities related to the environment were quite comprehensively audited under standard operation procedures,, both on paper and physically, said respondents. For example, when an estate was audited, auditors looked at how employees handled chemicals in store, and they would also go to the field to inspect on how employees conduct spraying, the instruments that they used, and how they safely used chemicals. In addition, at a palm oil mill, auditors inspected BOD levels, used the Ringelmann Chart to test levels of air emissions, and audited other aspects of the environment.

As far as the standard of auditing was concerned, most respondents said that they adhere to the Malaysian standards in relation to the environment, and for ISO 14000 they said they followed the international ISO standard.

j) Environmental Committee

Of the nine studied companies, three companies, B, D, and F reported the establishment of an environmental committee at the corporate level, under the quality and environmental unit. In company B, it was chaired by the head of the quality and environmental department, and the committee's members must be a head of department.

Among committee functions, according to the plantation director of company B, were: first, to report progress of projects on environmental issues that were being conducted by the company. Second, to discuss environmental and safety issues in the meeting exclusively (that is, no discussion on profits, but only a focus on the environment). And third, if an audit committee had identified any non-compliance, in the meeting the committee would discuss provisions to rectify these issues. Also for these companies at operational level, especially for mills who subscribed to ISO 14000 they had their own environmental committee to oversee their mills compliance with ISO 14000 requirements.

The environmental quality unit and environmental committees of companies B and F were at high portfolio level (hierarchy), and they were independent, not under any other department, and reported directly to CEO. As the general manager / head of the quality, environment and technology unit of company F said:

> Direct to chief executive. We report direct to him. It looks a bit high portfolio, problem with if you work direct, report direct to group chief executive, you can have two things. One you can be a blue eyes boy, tomorrow you can be black blue eyes boy. So be careful there are pros and cons. But the beauty of that is you can do your job without fear, favour and you stick to your professionalism. That is the purpose of my department.

For the other companies - A, C, E G H and I - at a corporate level the occupational safety and health committee (OSHC) would look after their environmental management as environmental issues were dealt with by this committee. These companies also had an OSHC at each mill and estate, with the estate or mill manager as the chairperson of the committee. The environmental issues were part of larger occupational safety and health issues at each estate and mill in these organisations. The exception was in the case of a mill with a ISO 14000 certified.

In terms of OSHC budget, respondents of companies A, C and I claimed they have their own budgets for the committee; but for, companies C, E and G they used the budget from their mills and estates. According to one of estate managers of company E, his committee looked after environmental issues under the Occupational Safety and Health Act (OSHA). According to him a dozen people were on the committee. As far as he was concerned his committee was quite successful in their duties because his estate did not encounter any serious problems and was able to comply with the OSHA. However, in

terms of his committee's budget he was quite dissatisfied. According to him this committee was supposed to get RM100,000 budget but hardly spent 10 percent of it. Since the establishment of safety and health committee is a requirement by the Occupational Safety and Health Act (OSHA) under Ministry of Human Resources (MHR), more often than not its function is focussed more on the health and safety aspects for employees rather than on the environment *per se.*

k) Environmental Training

Overwhelmingly, respondents of all companies said management personnel at top and medium level usually attended external training pertaining to environmental issues. Examples of training they received were: courses conducted by SIRIM (such as ISO 14000), conferences conducted by the MPOA, OSHA information, new technology for BOD treatment, as well as methane tapping from POME treatment. Sometimes companies invited consultants to conduct in-house training. However, it is also worth mentioning here that, at the corporate level, an individual manager's own inclination (both plantation and mill managers) usually determines the types and mode of environmental training they would attend. The group engineer of company G explained:

> High level (yes) those lower levels no. That's on own initiative… I'm a member of IEM, Institute Engineer Malaysia, sometimes we have seminar. If there is any related to the environment. I would go. What we can apply we apply. Because sometimes IEM's (Institute of Engineer of Malaysia) seminar is very general. If we need to apply we need to look at its suitability.

In relation to lower level workers, only in-house training was provided. This training was usually conducted in estates and mills by the company's own trainers. At the mill, their training was generally on how to handle machines, POME treatment and on safety awareness and other mandatory requirements. According to one estate manager (company A), he usually conducted training early in the morning when all workers gathered before working. Their training revolved around the safe usage of chemicals and other safety aspects on the plantation. 'Other than that not much', he added.

8.6 Typology of Environmental Strategy Proactiveness

The purpose of environmental typology is to clarify and summarise the three levels of environmental strategies (operational, tactical and strategic) of the nine companies in

this study. The typology of three generic categories of environmental strategies as derived in the quantitative analysis, namely Proactivist, Intermediator and Minimalist, was used in the study. Based on the various aspects of the three levels of environmental strategies discussed in previous sections of this chapter, three companies (B, D and F) were classified as proactivist, two as intermediator (E and H) and four (companies A, C, G and I) as minimalist. Proactivist companies are considered as utilising proactive environmental strategies, and both intermediator and minimalist companies are considered as reactive in terms of their environmental practices. Table 8.2 shows companies in each category and the level of environmental dimensions.

However it is important to note here that even for those found to be implementing a proactive environmental strategy none had attained the level of deep ecology. This indicates that MPOI companies in the study generally were employing environmental strategies that are framed in the 'shallow ecology' world-view.

i) Proactivists - Companies B, D and F

The proactivists exemplified a strategic response to environmental issues. These companies demonstrate some sort of a managed or systematic effort of their environmental practices, as well as a continuous ongoing goal of environmental improvement from operational to tactical and strategic level strategies. At the operational level companies in this category showed high attention towards most operational practices such investment in POME treatment, control of air pollution, reduction of utilities and chemicals, recycling, and increased oil extraction rate. It clearly seemed that what these companies did was generally intended to comply with the requirements of the law, as well as to increase the efficiency of their business. Nonetheless, despite high scores for the above-mentioned practices, the proactivists underachieved in water recycling, creating markets for waste and by-products, as well as reducing the impact of their activities on flora and fauna.

Table 8.2: ***Typology of Environmental Strategies against Environmental Dimensions***

	Strategy level and dimensions	Proactiveness Minimalist (A, C, G & I)	Intermediator (E and H)	Proactivist (B, D and F)
	Operational level			
i	Recycling waste materials	●	●	●
ii	Reduced usage of electricity	●	●	●
iii	Production/management process to increase OER	●	●	●
iv	Investment in cleaner POME and air emission	●	●	●
v	Controlled open burning	●	●	●
vi	Environmental Impact Assessment	●	●	●
vii	Recycling water and used-engine oil	○	○	○
viii	Using eco-friendly materials	○	○	○
ix	Create market for waste products	○	○	○
x	Reduced impact on flora and fauna	○	○	○
	Tactical level			
i	Environmental criteria for supplier/contractor	○	○	○
ii	Encouraged distributors' environmental practices	○	○	○
iii	EMS (e.g. ISO 14000 certification)	○	●	●
iv	Evaluated the life cycle of Palm Oil product	○	○	○
v	Round Table for Sustainable Palm Oil (RSPO)	○	○	●
vi	Published environmental policies	○	●	●
	Strategic level			
i	Board of directors concerned about environment	○	○	●
ii	Integration of environment into long term strategy	○	○	●
iii	Written environmental mission statement	○	○	●
iv	Established environmental objectives	○	○	●
v	Environmental management responsibility	○	○	●
vi	Environmental involvement of top management	○	○	●
vii	Strong environmental leadership	○	●	●
viii	Existence environmental officer/engineer	○	○	○
ix	Environmental audit	○	○	●
x	Environmental committee	○	○	●
xi	Environmental training for all levels of employees	○	○	○

● High practice ○ Low practice

Source: Based on the researcher's Interview (2006)

As well as operational practices, the tactical level practices were also observed. Companies adopting a proactivist strategy sought to integrate environmental management systems (EMS) into the framework of their businesses through environmental policies and management systems above the requirements of the law. Not only had these companies subscribed to ISO 14000 for a number of their mills and/or estates, but they also looked forward to expanding the certification, or gaining a similar type of certification, for other mills and/or estates. A further proactive strategy is the active role they play in environmental management in the industry, with all of these companies being members of RSPO. Publication of environmental strategies and

policies to both their employees and stakeholders showed that they exercised transparency. However, change management to incorporate green supplies is still lacking amongst proactivists, as there is little being done by the companies when it came to auditing their suppliers', contractors' and distributors' environmental management.

At a strategic level the proactivist companies had established a separate unit to look after their environment performance (known as the quality and environmental unit), which was high in the company's hierarchy and independent from other departments. Moreover, through its environmental committee, the unit also conducted periodic environmental audits and sent their reports to their corporate headquarters. The top managers not only showed very high interest in environmental issues but were also committed and held special environmental positions. This showed that their top managers gave environmental issues a top priority. Perhaps this might explain the existence of strong leadership in these companies. In relation to this, their board of directors also expressed concern for their companies' environmental performance.

Overall, it is true to say these proactive companies not only undertake operational level practices in fulfilment of environmental regulation and standard business practices of the palm oil industry, but more importantly undertaken both tactical and strategic practices and spent a considerable amount on investment for environmental protection.

ii) Intermediators - Companies E and H

Although intermediators exercised similarly high operational practices to proactivists, relatively they showed low levels of the practice of both tactical and strategic level environmental strategies. However, intermediators showed early indications of proactive behaviours. At a strategic level, their board of directors showed concern about their company's environmental performance. However, unlike proactivists, intermediators failed to integrate environmental issues with long term business strategy, let alone establish special environmental units on their own. Environmental issues played only a small part in overall occupational safety and health issues. In terms of written environmental policies and environmental audits, the practices were limited to ISO 14000 certified mills only. Top management personal involvement in

environmental management was only piecemeal, and they were relatively uninformed about the company's environmental problems. As a result, there was no existence of a dominant environmental leader in these organisations.

At a tactical level these intermediator companies showed voluntary behaviours through integration of an EMS into the framework of its business, and through environmental policy and management systems above the requirement of the law. However, this was not widespread throughout the companies, and was limited to only ISO 14000 certified mills, while the rest still did not have such systems. The same was true for publication of the company's environmental policies. In terms of active role played by the companies in environmental management of the industry, one of the two companies under this category is a member of RSPO.

Armed with the above analysis it clearly indicated that since intermediators had only undertaken one or two tactical and strategic practices, they, unlike proactivists, would not spend any appreciable amount of investment on environmental protection. They seemed to take precautions, and concentrate only on one or two practices such as compliance with ISO 14000 standards and membership of RSPO, perhaps in order to gain some benefits of doing so. For example, both ISO 14000 certification and RSPO membership would create a positive environmental image for their organisations. Despite limited practice of environmental strategies at both strategic and tactical levels, the intermediators, as with proactivists, showed high practice of most operational strategy items but did not achieve in terms of water recycling, marketing by products, and reducing impacts on flora and fauna.

iii) Minimalists - Companies A, C, G and I.

In complete contrast with proactivists, minimalist showed relatively low exercise of both tactical and strategic level strategy. The companies under this category failed to show systematic efforts of their environmental practices, or a continuous ongoing goal of environmental improvement from operational strategies to tactical and strategic level strategies. At strategic level, top managers neither showed an interest in environmental issues nor were committed to them. None held special environmental positions within their companies. This indicates that these top managers do not believe that

environmental issues should be a top priority, and it did not come as a surprise that no particular person was perceived as the environmental leader by the respondents from their companies. Since the minimalist companies have no environmental quality unit of their own, any environmental audit, if conducted at all, was not conducted independently but as a small part of the company's safety and health audit which is compulsory under industry regulations. Since their top management showed little is any interest in the environment, the OSHC did not report directly to them. Their top managers were only interested in their company's environmental issues when their companies were caught violating environmental regulations.

At a tactical level, none of these companies under this category adopted EMS nor integrated it into the framework of its business. This was evident as they did not establish their own environmental policies. In addition they did not play an active role in environmental management, such as being a member of the RSPO.

Despite lack of tactical and strategic practices, companies in this category showed high attention to most operational practices such as: investment in POME treatment, control of air pollution, reduction of utilities and chemicals use, recycling, and increasing the oil extraction rate. It clearly seems what these companies did was just to comply with the requirement of the law as well as work to increase efficiency of their business. Reactive companies had only undertaken operational level practices in fulfilment of environmental regulations and standard business practices of the palm oil industry, and spent the minimum amount possible on environmental protection. As with both proactivist and intermediator companies, minimalists performed least well in terms of water recycling, marketing by products, as well as reducing the impact of their activities on flora and fauna.

8.7 Environmental Strategy Proactiveness and Stakeholders' Pressure

This section investigates the perception by each environmental proactiveness group (proactivist, intermediator and minimalist) of various stakeholders' pressures on their companies (Table 8.3). Studying stakeholders' pressure, overwhelmingly all respondents (proactivist, intermediator and minimalist) perceived regulatory stakeholders, especially the DOE, as exerting the greatest pressure on them to improve

their environmental management practices. The interviews revealed the power and authority of the DOE over the industry. The analysis also showed that the more proactive the companies, the more they perceived a wider range stakeholders to be exerting an influence on them. For example, apart from regulatory stakeholders, proactivist perceived significant pressure from employees, notably top management, and secondary stakeholders, especially ENGOs, the media and competitors. As for intermediators besides regulatory stakeholders only ENGOs were perceived as exerting an influence on their companies. In contrast, regulatory stakeholders, and to a small extent the MPOA, were seen by minimalists as the stakeholders who exerted pressure on them. Meanwhile, this analysis also showed that the majority of primary stakeholders - shareholders, financial institutions, insurance companies, customers, suppliers and distributors - did not appear to exert an influence on any of the strategy proactiveness categories.

Table 8.3: ***Environmental Strategy Proactiveness and Stakeholders' Pressures***

Stakeholder		Proactiveness		
		Minimalist (A, C, G & I)	Intermediators (E and H)	Proactivist (B, D and F)
Regulatory -	DOE	●	●	●
Primary	Employees (inc.-top management)	○	○	●
	Customers	○	○	○
	Financial / insurance companies	○	○	○
	Shareholders	○	○	○
	MPOA	○	○	○
	MPOB	○	○	○
	Suppliers	○	○	○
	Distributor	○	○	○
Secondary	Local Community	○	○	○
	ENGOs	○	●	●
	Competitor	○	○	●
	Media	○	○	●

● High Pressure ○ Low Pressure Source: Based on the researcher's Interview (2006)

8.7.1 Regulatory Stakeholder Pressure

There were a number of reasons why companies in all the strategy proactiveness levels perceived the DOE as powerful and exerting a significant influence on them. The following discusses each of them.

a) Issues and revokes palm oil mill licence to operate

In Malaysia the DOE has the authority to issue and revoke a mill licence.

> [T]he thing is…DOE enforces the laws so on our part we have to comply. For instance you want to build a new mill you need to get licence which all must go through DOE. *(The plantation director of company B)*

> As for BOD level of our effluent, we must make sure, otherwise if our effluent (discharges) into river more than requirement, DOE will seal, will close our mill. *(The senior general manager of company G)*

b) Issues directives, compounds (infringement notices), and takes legal action.

Most of respondents admitted that they had, at some time, either been issued with a directive or compound, or been prosecuted by the DOE for violating environmental law.

> We got compound…….compound due to black smoke. *(The group engineer of company G)*

> The highest pressure comes from DOE, if we not comply it will fine or prosecuted us, however many cases fined by DOE not involved open burning but other cases. *(The general manager of company D)*

c) Requirement to submit verification regarding smoke emissions and POME

It is also a requirement for a palm oil mill to periodically submit smoke emission's chart and level of biological oxygen demand (BOD) of palm oil mill effluent (POME).

> [B]ecause all these we need to comply, to submit, so send our samples (POME), we do sampling according to their requirement, and it's our company responsibility. *(The process engineer of company I)*

> We have analysis, every month we send (samples of POME), we send, it's a requirement. They see data from third party lab (laboratory). We send to lab. For us we send to Felda's lab. Felda's lab reports 80 ppm BOD, When at one time DOE coming, they will go to our pond and taking its own samples. That samples will be used to issue us summon(fine). If our BOD increases to 140 ppm, surpassed allowable standard, they will fine us. *(The mill manager of company C)*

d) High level of enforcement

Respondents were of the opinion that DOE enforcement is very strict.

> In Malaysia as far as enforcement is concerned, I consider it quite tough. *(The senior general manager of company G)*

> They come, and (if they find we don't comply) they stop (our mill operation). So DOE very strict to do their enforcement.
>
> *(The general manager of company B)*

e) Visibility of DOE officers

High visibility of DOE officers may increase DOE regulatory pressure on the industry. Respondents were aware that the authority usually keeps a close eye on them. In Malaysia, DOE officers are required to visit each mill four times a year. Additionally, they also periodically conduct an air-borne surveillance to detect open burning in plantations.

> Their officers always present, because our mill too close with main road. Our mill only 3 km from main road. If they see little smoke they will come.
>
> *(The process engineer of company I)*

> [T]he department uses helicopter...then (will identify) those who burns, (also) its satellite will identify who is responsible.
>
> *(The group engineer of company G)*

f) Sensitive to public complaints and media reports

According to respondents, DOE officials are usually sensitive to public complaints and media reports pertaining to the environment. This was especially true for the MPOI.

> At present, on television they are under pressure. So they couldn't help but to take action (on polluters). They are forced to do it, if they don't do their jobs, top management will complaint. Meaning they need to do report.
>
> *(The assistant mill manager of company C)*

> While I was in Johor…due heavy rain, our pond flooding, some water inadvertently went into the river, and people complained about it, DOE came, and they gave directives, now we constructed a bank, high bank, check water to make sure all these things in proper condition. Because of Kampong (village) folks, now DOE jobs more difficult.
>
> *(The regional manager of company B)*

8.7.2 Primary Stakeholders Pressures

8.7.2.1 Employees

In terms of environmental pressure from employees, only respondents from the proactivist companies claimed that employees demanded better environmental performance, but this is especially true for top management, and not for lower level

employees. For example, according to the mill manager of company B the top management was not only responsible for the introduction of total environmental management in his companies, but was also actively involved in the system. He added that the company's management constantly monitored his mill's environmental performance. For example, every month he needed to submit environmental and safety performance reports for his mill. His counterpart, the general manager (mill operations Northern region) of company F mentioned the same thing. According to him in every meeting his CEO would touch on environmental issues and he also reminded his subordinates to adhere to the company's environmental policy and comply with environmental regulations.

On the other hand, most respondents in the interviews admitted that there was no pressure from low level employees in relation to environmental issues. It was a 'top down' exercise they said. For example, the manager of company F said as a mill manager he always asked his employees to comply with the regulations, and he also reminded his employees not to throw used-oil into the river. But for other respondents, though they claimed that their employees also wanted good environmental practices, the employees' views did not have any influence on management.

8.7.2.2 The Malaysian Palm Oil Association (MPOA)

For respondents of proactivist and intermediator companies, the palm oil association did not appear to exert any influence on them. But a few of minimalist representatives perceived some pressure from the MPOA in terms of corporate environmentalism. There were a number of ways this organisation exerted pressure on them. First, because as association members they should try to follow the guidelines and suggestions from the association as closely as they can. Second, the association from time to time conducts a series of seminars, conferences, and workshops on how to increase awareness on environmentalism in the industry. However, these respondents also admitted that as far as environmental regulations were concerned the association did not have power against their companies, so they tried to implement the strategies being suggested, however not at the expense of their financial bottom line.

8.7.2.3 Other Primary Stakeholders

Unlike perceived environmental pressure from employees (top management) and, to a small extent, the MPOA, none of respondents from the three categories of environmental proactiveness claimed that shareholders, financial institutions, insurance companies, customers, suppliers, distributors or the MPOB had imposed pressure on them in relation the their companies' environmental practices.

8.7.3 Secondary Stakeholders Pressure

8.7.3.1 Environmental Non Governmental Organisations (ENGOs)

As well as environmental regulators, both proactivist and intermediator respondents perceived ENGOs as threats to their companies. However, unlike environmental regulators, they overwhelmingly believed that the ENGOs threat was rather indirect. They knew that as non-governmental organisations, ENGOs do not have any specific power against them, but they realised the far-reaching impact of their pressure when other stakeholders accept accusations against the industry made by ENGOs. In relation to this the respondents also argued that ENGOs did not apply pressure to any particular companies but rather to the whole palm oil industry in Malaysia. The most popular strategy adopted by ENGOs, according to them, was through a smear campaign to discredit the MPOI. Such a campaign they argued was related in one way or another to the Orang Utan issue. Ten respondents (7 proactivists and 3 intermediators) informed the researcher about the so-called 'dirty' tactics used by ENGOs against the industry. According to them, such a dramatic negative campaign against the industry, on the issues of deforestation of tropical rainforests and the destruction of Orang Utan habitats since the late 1990s, would affect the industry in the eyes of the world if not properly addressed.

Amongst those who raised the ENGOs as threats to the industry, the general manager of company F was very vocal about this. As he put it:

> I think, we have (problem) with the ENGOs. And this has being going on because of technology and IT(information technology) being worse. Who are the ENGOs? WWF of the day, Proforest of the day, Friend of Forest, and whatever it is. What is their concern? They (ENGOs) say that we are killing the Orang Utan

> for the sake of getting our money for the oil and then is made ice-cream and sold over the world in Tesco, Sainsbury, and so forth. They make smear campaign all over the world. Okay, this is a concern.

Although proactivist and intermediator respondents argued that ENGOs do not attack any particular company, larger companies would feel more pressure due to their size. This was what the plantation director of company B said: 'They attack the whole industry, we are the XXXX largest plantation in Malaysia, and so that is why their accusation has more weight on us.'

Some of them believed ENGOs campaigns against the MPOI were not on the grounds of environment conservation *per se* but had a hidden agenda which palm oil competitors, for example soybean producers, were behind. They claimed soybean competitors used ENGOs as a proxy because they felt their business was being threatened by strong competition from palm oil in the world edible oil market. The general manager in company D believed the ENGOs' assault on the MPOI was a mere 'marketing challenge'.

When the researcher asked which ENGOs exerted more pressure, all participants pointed to international ENGOs. They believed that international ENGOs campaigns, through various means, would paint a negative image of the industry to governments as well as customers in their own countries (Western countries). As a result, the respondents were afraid they would boycott palm oil and palm oil related products. With the wrong information about the industry, customers would reject palm oil, they said. Meanwhile, on the local scene, the respondents believed Malaysian customers at large would not be affected by the campaigns. On the other hand, some respondents believed local ENGOs collaborated in terms of environmental regulation formulation, and also believed if ENGOs created an issue, the DOE would be aware of it and action would be taken in relation to the issue. That is why they considered ENGOs as a threat to their businesses.

Most of those who highlighted significant pressure from ENGOs agreed that a concerted effort from all players of the MPOI is paramount to counter negative ENGOs campaigns. All companies must shoulder this responsibility, was the point of view of the corporate manager of company D. He also added:

> [I]n Malaysia, MPOPC (Malaysian Palm Oil Promotional Council) plays its role to counter ENGOs argument. It engages in its own media campaign through its website, articles, etc and also engaged local media to do so. From time to time there are articles to counter negative accusation about us.

8.7.3.2 The Media

Responses to questions on stakeholder pressure led to the observation that proactivists perceived the media as a greater threat to their businesses, compared to the perceptions of intermediators and minimalists. They believed that any negative publicity would affect the good name of their companies. Indeed, as publicly listed companies, a positive image was very important. 'We want publicity for the right reason, not for the wrong reason', said the general manager of company D. The plantations director of company B saw the consequences when he said: 'Because once you (are) adversely reported or printed in the paper whatever you do all goes down to the drain'. He summed up:

> Once (your company) on newspaper very difficult to counter back the adverse report. For example, if it during prime news. It reports our mills were fined RM30,000 just to break environmental laws. Then media is very critical. If we can, we don't want adverse comments anything. We want to promote good image besides engaging all those environmental works, at the same time we need to maintain all these medias, newspapers and so forth.

Identifying media power as one of the important pressure groups in corporate environmentalism, these proactive companies tried to engage, and maintain, good relationships with the media, and one of the ways to do so is by sponsoring media activities such as media nights.

8.7.3.3 Competitors

In terms of competitors' pressure, it was observed that only proactivists perceived a high level of pressure from competitors. Competitors' advancement in corporate environmentalism was considered as a threat, as it would affect customers' confidence on their own products. Moreover, they did not want to be lagging behind in tapping into 'green' (environmentally friendly) customers, especially from the European market. They believed that to be more environmentally friendly provided a competitive edge for their companies.

The plantations director of company B argued strongly about competitors' threat in relation to green consumerism; as he succinctly said:

> Because our competitors, this one especially (for) overseas market. Let say this company, Z (other big non government linked palm oil company) for example, they say they are the first to introduce traceability CPO. It means their CPO can be traced back, we afraid we lost competitive advantage overseas. If you want to sell to India no such a thing. This one is mainly for European countries…… If company Z got certificate it will be the sole producer of safe products for example and then we are in trouble.

Similarly, the palm oil mill manager of company F argued that environmentally aware competitors put pressure on them to compete on this green bandwagon. His company, too, did not want to be lagging behind.

8.7.3.4 Local Communities

Of all the interviewed companies, only company I (minimalist), which is located in Sarawak, perceived a significant pressure from local communities. This is an isolated case, since in Sarawak there has been open resistance of local communities against the palm oil industry, mainly due to disputes over land, where indigenous people claimed that palm oil companies encroach on their native customary land rights (NCLR). The representatives of company I was fully aware of this issue. As one of them (the process engineer) put it:

> [F]or us we have problems with community because encroachment of native customary rights. That's the problem, but according to the deal we already paid. The problem is they reclaim it. First his father, and them his son also claim the same thing. But NGOs interfere.

Community pressure was a real problem that threatened the company; it affected their production as its employees could not do their jobs. Instead of negotiating with the local communities involved in the dispute, the company asked for assistance from authorities to deal with the pressure. The process engineer echoed this serious issue and action taken by his company to deal with it:

> [T]he extent we couldn't do our work. They prevented us from doing our work. But we take legal action, because we paid already for the land. We asked assistance from authorities, now it is okay. Last year the situation quite difficult for us, our production dropped due to the challenge.

In Sarawak NCLR issues are always intertwined with environmental issues; local communities also lodged complaints against palm oil companies on environmental grounds, such as water pollution, which was responsible for the dwindling of aquatic life in the river. However, such a claim is not as threatening as the NCLR issue.

8.7.4 Summary of strategy proactiveness and stakeholders' pressure

In the previous sections, whether proactive companies (proactivists) differed from reactive companies (intermediators and minimalists) in their perceptions of the relative threats of different stakeholders pertaining to their environmental strategies was investigated. By and large, companies at all levels of environmental proactiveness perceived high level pressure from environmental regulators, notably the DOE. The main reason the authorities were perceived in this way is due to the legislative power they are able to exercise against the MPOI. The DOE has the authority to issue and revoke a mill licence. Moreover the authority can also issue directives, compounds, and take legal action against non-compliant culprits. It is also a requirement for palm oil mills to submit monthly reports of their POME and air emissions. Management personnel of the surveyed companies felt that they are under close scrutiny of DOE enforcement officers.

In addition, the managers of proactive companies (proactivists) also perceived primary and secondary stakeholders as impinging on their environmental strategies. In the former category, this was notably top management, who are responsible for their companies' environmental strategies proactiveness through their involvement and constant support on environmental issues. However, other stakeholders in this category exerted little or no pressure on the proactivist companies. In the latter category, the media, ENGOs, and competitors were perceived as strong environmental pressure groups. While these stakeholders do not have direct power against them, proactivists believe they can exert pressure on them through their campaigns, adverse reports and collaboration with other stakeholders.

The reverse was true for the reactive companies. For intermediators, apart from regulatory stakeholders, only the activities of ENGOs were seen as applying pressure on

their company' environmental management. And for minimalists, apart from regulatory pressure, the MPOA exerted an influence on their environmental practices.

The findings indicate that there is strong relationship between stakeholders' pressure and strategic proactiveness. The more pressure a company perceived from its stakeholders the more likely it would be to exercise proactive environmental strategies.

8.8 Strategic Proactiveness and Environmental Effectiveness

The environmental effectiveness of nine companies in the study is discussed in terms of fines/compound, court cases pending, cost reduction (or increase) from environmental practices and technological investment, environmental disclosure, and environmental awards received.

a) Fines for violating environmental regulations

Of three companies in the proactive category, respondents of two companies (B and F) acknowledged that their companies had been fined in the past five years due to violations of environmental law. Plantations director of company B admitted that in a few instances they were fined by the DOE because the BOD level of their mills exceeded the stipulated standard. The same was also true for company F, according to the mill manager, his mill was fined RM 2,000 in the past for violating air emission law. But for company D, none of respondents admitted to either their mills or plantations being fined in the last five years.

Of the two intermediators, respondents of company E admitted that their mills had been fined in the past by the DOE, due to violation of smoke emissions and BOD levels that surpassed the stipulated limits. As for company H none of their mills and estates had been fined or prosecuted by the DOE in the past 5 year.

Similarly, for minimalists, representatives of companies C, G and I admitted that they had been fined in the past 5 years. For both company C and I their mills were heavily fined for both violation relating to the BOD effluent standard and the air emission standard. Respondents of company I did not give the amount of the fine, but company C

representatives disclosed that for violations of BOD standard they were fined between RM 10,000 to RM20,000 and for the air emission violation they were fined RM 1,000. As a result, one mill changed its boiler and invested in a proper treatment plant, where they spent close to RM 2 million to add more ponds on one of its mills. In another mill, because more ponds are unable to be added due to land limitation, its management focussed on pond maintenance and supervision. The same action was also taken by management of company I to ensure they complied with the regulations. Since then, they said they had been able to comply with the regulations.

As for those companies (in all environmental strategy proactiveness categories), A, D and H, who claimed that none of their mills or estates had been fined, their statements cannot be accepted at face value. The researcher tried to obtain details of mills and plantations that were fined or prosecuted by the DOE in the past five years, but to no avail. The DOE refused to cooperate and relinquish such information. In Malaysia such information is not usually available to the public. The researcher also tried to find news in local newspapers of any of these companies' mills and estates being fined or prosecuted for environmental violations, and by using Yahoo and Google searches, but again to no avail. This search was hampered by the nature of newspaper reporting in Malaysia that plays to the positive side of the story of these companies. This is especially true when these companies are GLCs. The newspapers had only on a few occasions reported a company that violated the law and was fined, but in many cases such a reporting practice was unlikely.

b) Court cases pending

Of the 9 companies, only company B still has a court case pending. According to its plantations director, in 1999 the company was charged in the court due to open burning. His company claimed not guilty and defended itself, its lawyer argued to the court that it was accidentally lit by someone or that it was sabotage, because the company has a zero burning policy.

c) Cost reduction or increase related to environmental practices and technological investment

Analysing respondents' answers to the question of whether there were any cost reductions or increases from environmental practices, produced two clear results. On the one hand, environmental practices in a palm oil mill increased operational cost, and on the other hand, many environmental practices in plantations managed to reduce operational cost.

In a palm oil mill, costs were incurred due to the establishment and maintenance of POME treatment systems, de-sludging/silting, and air emission control to reduce air pollution. All these, according to respondents were very expensive. For example, to ensure air emission according to the standard set up by the DOE, a mill needs to install a multi-cyclone dust collecting system, which needs to be replaced periodically. Nonetheless, many of them argued that there are intangible benefits of doing so. For instance, they could reduce hidden costs, since if they do not do so they would be fined by the authority. Not only this will incur some financial penalty but also their mill's good name will be tarnished. Despite the costs, proactive companies tended to make high investment to further improve their oil extraction rate as well as to increase efficiency of their POME treatment and air emission standards.

The situation was quite different for oil palm estates. Many of its environmental practices, such as the application of EFB back to estates as fertilizer, and IPM including biological control, managed to significantly reduce their operational costs. While respondents unanimously agreed that return of EFB to estates managed to reduce use of inorganic fertilizer, they gave different percentages as to how much such a practice did so. The range of reduction was between 10 percent and 50 percent. However, not all environmental practices in estates reduced operational cost; activities like zero burning, or the establishment of pits and banks and terraces to reduce soil erosion, increased operational cost. Although chipping of palm oil trunks would allow them to decompose naturally on plantations, not much nutrient was gained from this practice.

As for ISO 14000 certified mills and estates, respondents claimed no reduction in the financial cost of operation or direct financial benefit from certification, but it benefited them in terms of their environmental operation systems. In addition, their companies

tended to make more investment in high technology. For example, company F spent money to improve their POME treatment by using new techniques with active bacteria in their ponds. Some investment was also allocated to increase efficiency of their air emission control measures. For example, the mill used a cyclone filter that was equipped with computer to record the amount of emission release from their chimneys. As for company B, their respondents claimed that their POME treatment was more efficient as they capitalised on the advance techniques of using an Anaerobic Digester. Both the technological and management process made their jobs are more efficient and systematic. Due to the system of using monthly checklists they could monitor their mill operations. In addition, such a system increased environmental awareness and in turn nurtured an environmentally conscious culture amongst employees.

d) Environmental Disclosure

In terms of environmental disclosure, proactivists claimed they were more transparent in sharing with the public details of their environmental activities. Companies B and D for instance, collaborated with local universities in environmental conservation projects and university students frequently visited their plantations to retrieve samples for their research. The projects would also see the publication of booklets on the diversified species of birds found in the plantations. Moreover, some of representatives of those proactive companies showed the researcher their companies' annual reports, in which the reports of environmental activities conducted in both plantations and mills were highlighted. Moreover, a number of respondents claimed that it was not uncommon for outsiders, such as their distributors from European countries, to visit to their plantations and mills to observe their operations.

e) Environmental Awards

In terms of environmental awards, proactivists companies gained higher environmental awards compared to intermediators and minimalist. And among the proactivists**,** **c**ompany B had received the highest environmental awards. The following were environmental awards received by Company B: In 2006 the company received a national award for its annual report environmental reporting, and an award for its contributions to the welfare of its workers, conferred by Ministry of Human Resource of Malaysia. For three consecutive years; 2002, 2003 and 2004 it received the award as

one the best Malaysian companies for environmental reporting in annual report. These awards were conferred by a professional body in Malaysia. In addition, four of its palm oil mills have been awarded MS ISO 14001 Certification in 1997, 2000 and 2001. At an international level, in 1992, it was one of the recipients of an international award in the recognition of outstanding practice achieved in the protection and improvement of the environment for zero burning practices in plantations.

Company F also gained a number of environmental awards. In 2004 it received a certification from the EU pertaining to good agricultural practices. The certification was awarded to its three estates, and it was amongst the first Malaysian companies to receive such a certification. In the same year it was also recognised by the professional body in Malaysia in regard to its annual report. And one of its estates was awarded ISO 14001 in 1997. As for company D, two of its mills and one of its estates were ISO 14001 certified.

Of the two intermediators, company H had received one environmental award at the state level, when in 2003 one of its mills won the best mill award. The award was conferred by the DOE in conjunction with Environmental Week. The same mill was also awarded ISO 14001 certification in 1997. And for company E one of its mills had also been ISO 14000 certified.

On the other hand, no palm oil mills and estates of the four minimalists companies were reported as having received any environmental awards.

8.8.1 Summary of Strategy Proactiveness and Environmental Effectiveness

This project studied each environmental strategy's proactiveness against environmental effectiveness from five indicators. There are a number of observations that can be made. First in terms of fines for violating environmental regulation, at least one company in each of the categories of environmental proactiveness had been fined in the past five years. This shows that whatever strategy they pursued they were not spared from violating environmental law. In terms of court cases pending only company B, a proactivist company, still has one court case pending, because the company has pleaded not guilty and has asked for a trial. When considering whether there is a cost reduction

or an increase as a result of their environmental strategies, the analysis showed that in all categories the same pattern was observed, where environmental practices in oil palm plantations managed to reduce operation costs, but such practices in palm oil mills increased operations costs. A noticeable difference was observed for environmental disclosure, where proactivists tended to disclosure more about their environmental activities. The same was observed for environmental awards, where proactivists received more environmental rewards, followed by intermediators, while none were received by minimalists. Furthermore, proactive companies were clearly found to make high technological investment to improve their oil extraction rate efficiency, as well as making financial investments in POME effluent and air emission control systems.

8.9 Strategic Proactiveness and Competitive Advantage

Participants from the proactivist companies claimed that their companies gained a competitive advantage due to their environmental strategy. For company B, its competitive advantages were: more concern about employees and stakeholders, more transparency, and being a leader in environmental management. Another competitive advantage their representatives claimed was market differentiation. They claimed they sold 'premium oil' to their customers. As for company F amongst its competitive advantages the representatives included: more efficiency, complying with regulations, no negative news reports, and a good company reputation, as well as market differentiation. Company D's competitive advantages were: being a sustainable palm oil company, improved staff environmental commitment, positive media coverage, and market differentiation.

Intermediator company representatives also claimed to gain competitive advantage because of their strategies. For companies E and H three competitive advantages gained were: complying with regulations, improved material efficiency, and the company's good name.

As for the minimalists, only company I did not see any competitive advantage from its environmental strategy. One of its respondents told the researcher that since his company is a producer of crude oil and sells it to a refinery locally, he perceived no competitive advantage from its environmental strategy. But for others there were a number of competitive advantages perceived by its respondents. Less pressure from the DOE and community, and employee welfare are two competitive advantages reported by company C.

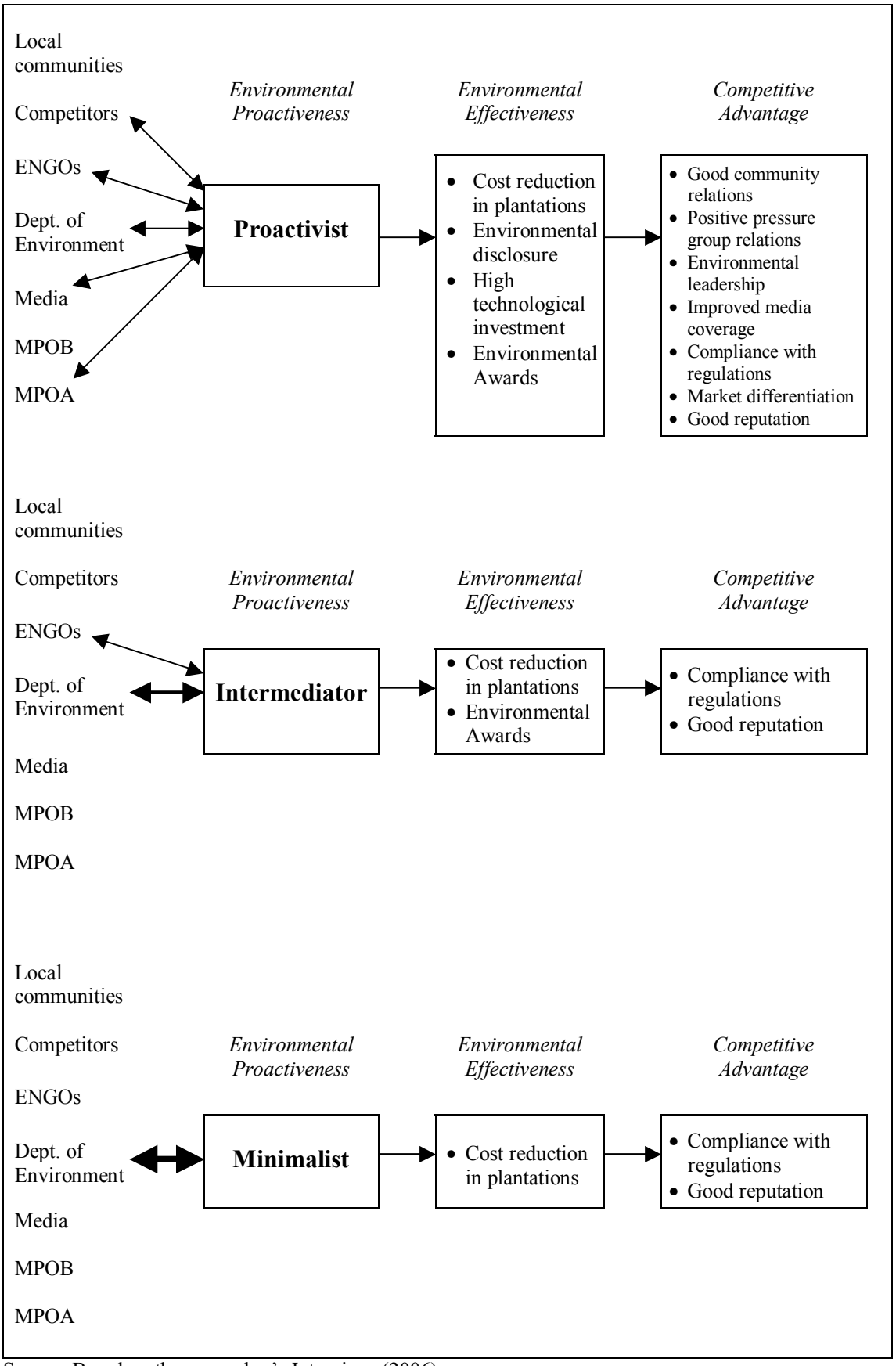
For company G, the company's good name and stability of workforce are seen as its competitive advantages. And for company A, the reported advantages included less pressure from the DOE, improved employee relationships, and more concern toward the environment, as well as improved material efficiency.

Comparing competitive advantages of the three environmental strategy proactiveness categories showed that proactivists had more competitive advantages than both intermediators and minimalists. Amongst competitive advantages gained exclusively by proactivists were: improved community relations, more transparency, improve staff commitment to environmental management, leadership in environmental management and sustainable palm oil, as well as improve media coverage. While for both intermediator and minimalist their competitive advantages were limited to compliance with regulation, employees' satisfaction and good name, all of which were also advantages claimed by proactivists.

8.10 Relationship between Stakeholders' Pressures, Environmental Proactiveness, Effectiveness and Competitive Advantages

Figure 8.1, on the following page, shows stakeholders' pressure, environmental effectiveness and competitive advantages in relation to the various environmental strategy proactiveness categories. Of the three strategies, proactivists perceived pressures from wider range of stakeholders (DOE, upper management employees, ENGOs, media and competitors). They also gained greater environmentally effectiveness by managing to reduce operational costs in plantation, receiving more environmental awards, having high investment in green technology, as well as greater disclosure to stakeholders. Furthermore, proactivists perceived more competitive advantages: improved stakeholder relationships, improved staff commitments, environmental leadership, compliance with regulations, improved media coverage, and product differentiation. Unlike proactivists, intermediators perceived strong pressures only from DOE and ENGOs. Intermediators, as with proactivists, had managed to reduce operational costs in plantations, and had received some environmental awards, although fewer awards than proactivists

Figure 8.1: ***Stakeholders' Pressures, Environmental Effectiveness and Competitive Advantage of Various Environmental Proactiveness***



Source: Based on the researcher's Interview (2006)

In terms of competitive advantage, compliance with regulations and good name were the only two competitive advantages this group were perceived to have gained. Minimalists seemed to perceive a threat from only the regulatory stakeholders (DOE and the MPOB), and the only efficiency they gained was cost reduction in plantations. Similarly to intermediators, compliance with regulation and good name were the two competitive advantages these minimalist companies gained from their environmental practices.

8.11 Obstacles to being Environmentally Friendly Companies

There were four major barriers against proactive environmental management observed from the interview responses.

First, it is no surprising that finance was named as the greatest obstacle to being a more environmentally friendly company. As the environmental officer of company D explained:

> The main factor, I think from financial aspect of it. If we have enough money no problem, that's the main problem. Everybody wants, nobody says no, actually everybody pays attention towards this, cleanliness, safety and all that. But the problem is money.

The senior general manager of company B concurred:

> I think we need a lot of fund. In other words we need a lot of money. We can't go all at once, but we need to go in stages. You can't go sudden, you must go slowly. And you will see at the end of the day ... the result. But we keep moving towards that. But slowly…but steadily, we are moving towards that. So it very costly. Okay, for example, we got on a trial on organic oil palm, we don't spray everything, we can't use any pesticides, but the cost is very high, 10 times higher than the conventional one. We have around 600 hectares (oil palms). But we try our best, you see we want to go from beginning (nursery) to harvesting, organic, I mean you comply all, this costly, production cost very high from nursery to harvesting. So the cost is very high.

The second major barrier to being more environmentally responsible was lack of support and commitment from upper management levels. For example, the palm oil mill manager of company C claimed that top management in his organisation had yet to achieve the level that recognises the need for corporate environmental management. He argued that the improvements of his mill's environmental practices merely came from his own initiatives, and only when he raised the issues in a meeting would his top

management respond and ask him to continue; however, they would not be interested if such practices involved a lot of money. Top down corporate environmentalism is clearly absent in this case.

Low environmental education and outlook amongst employees was the third barrier preventing environmental improvements in the palm oil companies. The most frequent comment about this barrier came from estate managers. In Malaysia overwhelmingly most employees in palm oil estates are foreign labours who have a low educational standard. These foreign labourers main objective is to earn money to take back to their home countries. They do not really understand why they need to follow rules and regulations pertaining to environmental management, since after all it is not their own country. So to ensure that they comply requires education and constant monitoring from estate supervisors. One of estate managers of company C complained about this situation:

> Sometimes employees don't really understand. At present we use foreign labours, they not really understand, their lifestyle at their villages different from us (here). They came here, (they) need to adopt themselves but it takes some time. We need to monitor them properly to the extent that they fully understand and practise what we ask them to do...to change this thing (it) will take some time.

The fourth major barrier, according to most respondents, was the unwillingness of customers to pay more for palm oil that is produced by environmentally proactive companies. Respondents claimed that they could not pass on the high cost of environmental improvement to their customers. This aspect really concerned the senior general manager of company F:

> This is (the) pain is facing the industry. They want this (environmentally friendly practice) but they are not willing to pay premium price. Because price is dictated by the commodity. In the plantation industry we are price taker. When you are price taker your main strategy is cost. Because if you not you cannot compete.

Besides those four major barriers, there were three other low barriers of corporate environmentalism mentioned: lack of support and/or appreciation from the government for an environmentally proactive company; lack of expertise in environmental management amongst palm oil companies; and lack of human resources to handle environmental issues properly.

8.12 Government incentives and encouragement

In the previous section the barriers to corporate environmental management were identified and discussed. This section looks at measures that should be taken by the Malaysian government to promote corporate environmental management in the palm oil industry. There were a plethora of suggestions given by the respondents on what the government could do to encourage corporate environmentalism in the Malaysian palm oil industry. These are divided into high order and low order responses (Table 8.4).

Table 8.4: ***High and low order responses to increase environmental management in the MPOI.***

High order response	Low order response
i. Government incentives	i. More environmental officers
ii. Government promotion	ii. More experts in environmental performance
iii. Better enforcement from authorities	iii. Severe punishment
	iv. Carbon credit

Source: Based on the researcher's Interview (2006)

8.12.1 High Order Responses

For many respondents if the MPOI is to become more environmentally friendly, the government would need to provide some sort of financial incentives. Examples of financial incentives were: tax rebates/relief; monetary rewards; grants; reduction in licence fees; discounts on material purchase; and reduction of export duty (cess). The two following remarks were obvious demands for financial incentives:

The deputy group engineer of company E said:

> Most of us are talking about incentives, tax rebates, all that, especially for technology to improve (environmental practices), DOE should provide some discounts or tax rebates if we bring (technology) from out side to our country.

And the senior general manager of company G said:

> Rewards such as tax incentives, for example, for companies that implement this and this, so (they know) what rewards they can get from the government. One example is bio-tech (bio-technology). A company does this will get tax relief. Or at least has something. So (for) those (who) invest more environmentally friendly activities, will get more.

According to some respondents, punishment would force companies to be reactive just to comply with the regulations, however incentives encourage voluntary practices which in turn help companies to be more proactive and to do something beyond regulatory

requirements. This was why incentives seemed more appropriate. The senior general manager of company G argued:

> If only punishment, people will do (comply). That's law. They just follow law. But if there are rewards to such company (environmentally friendly) so people will go beyond point. If for punishment this is the point, people will go beyond compliance when there are rewards. At present if only punishment people do comply. (This is) the result. So if there is reward people are talking about getting advantage. So when there is punishment, (at the same time there) must have reward. Must be balance and then we will achieve our aim (to improve environmental management).

Financial incentives not only related to ways of reducing environmental impact, but also to encourage palm oil companies to invest in environmentally friendly practices. One case in point is to produce bio-diesel from palm oil. They suggested that the government step in by providing a subsidy to companies that undertake bio-diesel production, as this effort enables bio-diesel prices in the market to become cheaper than normal fuel, an thus attracts more users. A high proportion of the suggestions on financial incentives suggested that palm oil companies are looking for economic benefits of being environmentally friendly, not for the sake of the environmental rewards themselves. In this respect, the adage 'the business of business is business' seems true - shareholders remain dominant stakeholders (Gibson, 2000).

The second highest scoring response related to government promotion. Amongst promotional means raised were: recognition, environmental campaigns, competition, and education and training. This shows financial incentives alone are not enough to promote the palm oil industry to be more environmentally responsible. The general manager of company F described his views:

> You must give a compensation (financial incentives), number one. Number two reward and recognition as a promotion tool. (if)You might not reward, at least recognise any human being (who) want to feel important period of life. If I tell you, you are the best in public, you feel so important that you know all the money is priceless. This all we want. So X (his company's name) is making money, Y (a competitor) is making money, even Z (a competitor) is making money. All they want is recognition for the effort they do. If you want to promote, then if we want to be promoted or recognised do you think I don't not want to share experience with others? Of course I do. Either in the forum, in this stage, we are proud because international or national recognition.

Environmental campaigns were also considered an important tool amongst respondents. The government and its related authorities should educate palm oil companies about

why they need to be more environmentally proactive. In relation to education, this was what the estate manager of company G said:

> For me go back to education, awareness (of) good environmental practices, I think (through) education. You force people, there are some effects, their management will do. But how long it can last? That's it.

The third highest scoring response was for better enforcement from the government authorities, especially for the DOE. Respondents generally believed the department should be doing more to ensure environmental laws pertaining to the palm oil industry are more reliably enforced. This is to ensure if not all, then almost all palm oil companies comply with the regulations.

The high response for better enforcement amongst respondents of the surveyed companies tended to indicate that the palm oil companies in this study were not totally opposed to using legislation as a means of controlling environmental practices. In other words incentives should not be introduced at the expense of regulation. Many of them argued that both the 'stick and carrot' were the best approach to increase corporate environmentalism in the industry. The corporate manager of company D admitted that both reward and enforcement were essentials:

> Enforcement one of the ways, but should be rewards. Tax incentive, recognition and you also need to put in extra effort, through tax incentives and recognition so (a) company can take pride of it.

The estate manager of the same company, company D also voiced the same opinion:

> I think (through) incentives, for example, punish a company that exercises open burning and at the same time those who environmentally friendly should get tax reduction or both, if we buy materials, product, we got discount. We also can ask reduction of (export) cess.

8.12.2 Low Order Responses

The first of the low order responses related to the DOE, in which the department was expected to have more officers who are expert in environmental management, in order assist palm oil companies to deal with environmental issues. In this respect, DOE officers also need to be sufficiently knowledgeable in their field and to act professionally when they deal with palm oil companies. A few respondents argued that what most the DOE did was to follow the strict rule of procedures, without providing

much flexibility to palm oil companies to develop a better system of dealing with environmental issues. For instance, in the case of palm oil mills, DOE officers are too concerned with following the specific regulations to allow any room to be given to mill operators to find a better alternative of complying the environmental law. The palm oil mill manager of company C could not hide his frustration when he told the researcher how he was dealing with DOE officers, who in many ways followed the book (procedure). Those officers disapproved when he tried to do something different to increase efficiency in de-silting of POME of his ponds:

> So far they yet to advise us engineer, do like this I guarantee you can (comply with the regulation). They yet do that, it means we need to do on our own… let say we want to do recycle, from a facultative pond goes up into an anaerobic pond, recycles for cooling purpose. Reduce down temperature from 50 Celsius to 30 Celsius… This what I wanted to do, but when they came they asked me, do you write a report? Okay now you added new component here, so pressure time increases, put us in a difficult situation. We thought to make their jobs easier, but we need to write a letter asking approval of our pump capacity. It doesn't work like that. Supposedly when they came, when we said okay, okay for them. That was our idea, we are operators. Because everyday we are here, we know, but when they came they said like this, like that. Actually I had an idea to do that, but when they came I abandoned it. Because they followed the book, they depended on the act's book. Under this act, it mentions a procedure that you need to do this. Anything you do you need to apply from DOE. We wanted to do it in two days time, to get approval it would take at least a week, so we didn't do that. Better not to do sometimes, I fed up, once I quarrelled with environmental officers in this room. I want to help you but you put pressure on me. To recycle I already bought pump, our pond is wide so we divided it into four, I made dividers but they asked me to undo them. I did that because it would be easy for us to de-silting. So we can do de-silting separately, if the pond is wide we can't do so.

As a second response, respondents suggested there should be more experts in environmental management to help palm oil companies to better deal with the issues. As an environmental officer of company D said: '[E]xpertise (in environmental management), we also need that, because we actually a plantation based company so expertise for(sic) environment is lagging.'

A third suggestion was that severe punishment be imposed on the culprits to act as a deterrent to others not to violate the environmental regulations. Although according to the Environmental Quality Act (1977) if any company is found guilty of discharging excessive limit of BOD of POME into river system they will be subject to a fine of up to RM100,000, in reality, the courts have imposed lighter punishments of only a few

thousand Ringgit. This is a small sum compared to the amount of income palm oil mills generate from their business activities, and is thus not a deterrent.

The last low order response was related to a carbon-credit system, similar to the one that has been introduced for industries in the EU countries. Two respondents who suggested this measure argued that it might help palm oil companies to be more environmentally responsible if the government introduces the system. Under the programme, environmentally conscious firms can generate tradable carbon credits, and thus gain financial advantage when polluting companies buy their credits.

To achieve better environmental management in the industry the onus is not on regulatory departments such as DOE alone, the general manager of company F argued that there must be concerted efforts from the Malaysian Palm Oil Board (MPOB), the Ministry of Plantation Industries and Commodities, the Ministry of Agriculture and Agro-based Industries, and other government departments, who have direct and or indirect relationship with the industry.

Studying the above-mentioned suggestions it clear that a holistic approach, which seeks mutual roles of palm oil companies and stakeholders, especially the government, the community and consumers, is of paramount importance towards achieving corporate environmentalism.

8.13 Summary

Based on an analysis of the transcripts of interviews with the participants from the nine palm oil companies, this chapter investigated palm oil industry challenges, sustainability, stakeholders' pressure, environmental practices at operational, tactical and strategic level, typology of environmental strategy proactiveness, environmental effectiveness and competitive advantage. In addition it also looked at the relationship between stakeholder' pressure, environmental strategy proactiveness, environmental efficiency and competitive advantage.

As far as the industry is concerned, increasing operational costs as a result of escalating material and labour costs in both plantation and estate, fluctuations in palm oil price in

the international market, productivity in terms of fruit yield per hectare as well as oil extraction rate, were amongst the general challenges faced by the industry. In terms of environmental challenges, respondents' views were quite divided; some recognised environmental issues exacerbated by the industry such as deforestation, air and water pollution, but some tended to deny them. However, a different attitude was observed for the industry's sustainability, where almost all respondents claimed that the industry would be economically and environmentally sustainable. Based on the three levels of environmental practices, the companies in the study were divided into three strategies: proactivist (three companies), intermediator (two companies) and minimalist (four companies). The proactivists showed high voluntary involvement in environmental practices at the both tactical and strategic level activities: for example environmental management systems, environmental audit, strong environmental leaders to name but a few. In addition it was observed that the more proactive the companies, the wider range of pressures they perceived from stakeholders. Additionally, the more proactive companies also seemed to gain more environmental effectiveness as well as competitive advantage than the reactive groups of companies.

Chapter Nine

Qualitative Analysis of Palm Oil Industry Stakeholders and Consolidation of Quantitative and Qualitative Data

9.1 Introduction

The main purpose of interviews with selected stakeholders of the Malaysian Palm Oil Industry is to gain a more rounded view of corporate environmentalism in the industry. The results of interviews are organised into eight parts. The first section looks at stakeholders' challenges in relation to the MPOI environmental issues; the second part looks at the environmental issues caused by the industry; while in the third part discusses environmental strategy approaches taken by palm oil companies. The seriousness of the Malaysian palm oil companies to deal with environmental issues, and approaches taken by these stakeholders to exert pressure, as well as the extent of their pressure on the MPOI to be environmentally responsible will be respectively discussed in the fourth and fifth section. The sixth and seventh sections examine stakeholders' perception on accessibility of environmental information from palm oil companies and stakeholders' relationship with palm oil companies respectively. The eight section looks at stakeholders' perception of the relationship between proactive environmental strategies and competitive advantages, as well as ways to increase industry corporate environmentalism. The last part synthesizes the results of analyses of the both quantitative and qualitative methods to see whether they are similar to or different from one another. As with the previous chapter (Chapter 8) representative sampling of only one or two relevant quotes will punctuate the results.

9.2 Stakeholders' Challenges Pertaining to the MPOI Environmental Issues

Altogether 15 interviews were conducted with individuals from various palm oil industry stakeholders – ENGOs, the DOE, MPOA, media and a law firm. In terms of organisational constraints, and the challenges the stakeholders faced to increase the MPOI's corporate environmentalism, in general there were two types of answer given by respondents. The first type were challenges that were collectively shared by

stakeholder groups; and the second type were more specific challenges faced by a particular stakeholder.

From the analysis of the interviews from various stakeholder groups, with the exception of pro-government media (newspapers A, B and C), financial constraint was identified as a common problem shared by most stakeholders. For both the DOE and the MPOB, they faced financial problems due to an insufficient budget allocation by the government. Compared to other agencies within the Ministry of Natural Resources and Environment (MNRE), the DOE usually received the lowest budget. Other departments such as the Drainage and Irrigation Department (DID) and the Malaysian Institute of Microelectronic Systems (MIMOS), to name but two, receive a larger budget, as they are considered more significant to the economic growth of the country. This was acknowledged by the head of a unit at the DOE headquarters in Putrajaya. Meanwhile, as for ENGOs they are non-profit organisations and usually received insufficient funding from individuals and or businesses that sympathise with their causes. They also depend on the fees of their members, and selling books and other materials as sources of income. Despite its financial constraints, the representative from SAM (Sahabat Alam Malaysia) said his organisation had a strong opposition to receiving money from the government and businesses for fear of having their mission compromised or modified. According to some respondents of ENGOs there were a number of projects they would like to promote, but are unable to do so because money is not available. The same problem was reported for the MPOA, where the main source of its income comes from fees of its members (palm oil companies), which are not all paid according to requirements. As for an opposition media (newspaper D), the government restriction on its newspaper circulation and mode of publication, from twice a week to twice a month, was considered as the main contributing factor to its financial problems.

Another challenge commonly faced by these stakeholders (DOE, ENGOs and MPOB) was lack of staff. This was believed to have a strong relationship with the financial issue. Unlike other stakeholders, respondents from the DOE discussed this predicament at length. They said that although it could not be denied that the government over the past two decades has increased the number of staff of the department, staffing was still inadequate. At the time of the interviews, the number of DOE employees throughout Malaysia was around 1500, including administrative staff. This problem had prevented

the organisation from conducting its duties effectively, as the available staff needed to do diverse jobs, not only restricted to enforcement of regulations. The head of a unit at the DOE headquarters in Putrajaya admitted:

> Not enough, because of 1500 staff, that total if we look carefully, we can divide them to technical and non technical, such as administration. And as for technical they have their own task. Some in headquarter, some at state level. And at state level some do enforcement task and some don't. Not all do enforcement. So 1500 for the whole Malaysia, the fact is not enough.

The senior executive of DOE Kelantan also concurred: 'Even if all of them do enforcement work such numbers of staff still are inadequate because scope of environmental management under the department jurisdiction is broad, including air, water, marine and soil.'

This staff shortage was also reported by the senior enforcement officer of Sabah Environment Protection Department (SEPD), who claimed her department was seriously handicapped by a lack of numbers. She elaborated that her department was staffed by 60 personnel, including administrative staff. As a result a small number of environmental officers needed to monitor the entire state of Sabah. According to her, ten staff were responsible for carrying out 200 EIA reports.

As a result of under-staffing, enforcement officers need to handle numerous environmental cases. Since they are over loaded, it is not easy for them to specialise in any specific area. This in turn would reduce the effectiveness and efficiency of the staff. This was what the senior enforcement officer of DOE Kelantan complained about:

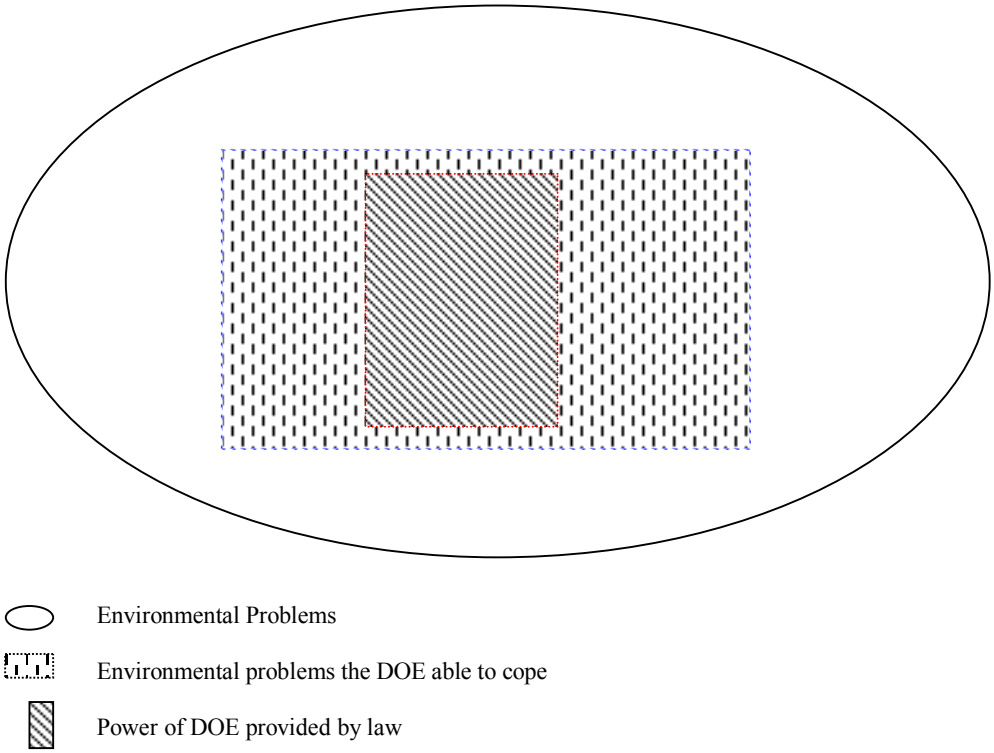
> [O]ur job work load….it is too much, we can't concentrate on one particular thing, by the time we (are) about getting the job done..other task comes, so when will we get the job done? New issues will appear, when we want to address the issue, other issue arises, so we don't have time to address it. As a result we can't expert in any particular area. ….we can't do many things in proper ways (effectively and efficiently). Sometimes we want to do this thing, but we forgotten because we don't do it for sometime, we need to refer back (to procedures/manuals)… how to do this?

When the researcher probed in-depth about how serious the problem was, the DOE respondents could not provide an exact figure of the number of enforcement officers against the number of industry sites that he or she was responsible for. But according to the head of a unit of the DOE at the headquarters, during the organisation's restructure in 2002, in which he was involved, his department did obtain a rough figure in relation

to this. According to him, a DOE team that consisted of three individuals (environmental officers, one assistant, and one technician) was responsible for 500 factories/sites. In the researcher's calculation, in order to visit 500 sites once each year, a team needs to monitor and/or inspect at least 41 sites every month. In five working days, it means that each day a team needs to inspect at least eight factories. This is considered an extremely high load for them. In the case of oil palm companies, although it is a requirement for the DOE staff to visit each mill four times a year, due to constraints of accessibility and inadequate staff, more often than not the DOE staff were able to make two visits a year, the senior executive of DOE Kelantan reported.

Both the DOE and the media face legal challenges in relation to environmental issues. The DOE faces constraints in terms of law and legislative power. Current environmental law and the legislative power of the department are inadequate to address environmental issues in Malaysia. The head of a unit at the DOE headquarters in Putrajaya sketched Figure 9.1 to illustrate this constraint.

Figure 9.1: ***Environmental Problems and Power of the Department of Environment (DOE)***



Source: Based on the researcher's Interview (2006)

According to him the DOE is only able to cope to a certain extent with the environmental issues in Malaysia, and other authorities, as well as the public, must play

their own role and be partly responsible for addressing environmental issues in the country. The problem is compounded by the power of the DOE, as provided by law, being inadequate. This is due to the nature of environmental legislation in Malaysia, where the DOE as the federal government agency is only responsible for environmental issues exacerbated by industries, while other environmental matters pertaining to land and water are still under state control. Each state has its own local authorities, but of the total number of 13 states in Malaysia only two (Sabah and Sarawak) have their own environmental agencies. In other words although legally it is a state matter to look after the environment, almost all states do not have their own environmental unit, and as a result, the DOE as the federal agency acts as the *de facto* authority and is usually perceived by many as responsible for all environmental issues. The head of a unit at the DOE headquarters expressed this predicament at length when he made his comparison on this matter between Malaysia and the US:

> In the US system, it has environmental officers at federal level, and it has environmental officers at state level. And most probably it has environmental officers at local authority. As for us, all our environmental officers are at federal level. But from this federal level we send to state level. This is the difference, it means from us, in our system, what we use right now is all environmental issues are handled by federal. On the contrary, in the US, at federal it monitors the policy and national coordination. When it comes to implementation, state has it own environmental officers. They will implement it at the state level. Meaning that, it has a very clear job description. Unlike the US, (here) all from federal, states don't have. Only two states have their own Sabah and Sarawak. But in Sabah and Sarawak they create agency, but agency more on enforcement or responsible to take care things under state matter. It means environmental issues related to land, water under state jurisdiction. The rests go to federal. What really happen in Sabah and Sarawak is we have division (of task). (In our country) The environment (EQA) exist more from perspective of industry. Industrial focus. In Sabah and Sarawak what we see there is some sort of complementing one another. But not all states in Peninsular Malaysia. It means all environmental management jobs in all states except for Sabah and Sarawak under federal. Only they do the job. And in Malaysia, one more sphere is, local authority. If we model our system according to developed countries, Japan, US they have that clear job description at federal, state and local authority. We should have environmental officers at local authority. But we don't. We got one, at DBKL (Kuala Lumpur Municipal Council). It has it own environmental management unit. So what happen, environmental officers at environmental management unit complementing us. It means although we have our own regulatory department in Kuala Lumpur, DBKL will complement our job. So that why DBKL managing the environment is so much successful compared with other places or other states.

As for reporters from newspaper agencies in Malaysia, their legal challenge was quite different from that faced by the DOE. They said they could be subject to legal actions in

relation to the news that they published. That is why in Malaysia reporters, as well newspaper agencies, usually take extra precautions and they need reliable facts or accurate information to write their news content. Both the senior reporters of newspaper A and B indicated that they could be sued for incorrect information, and that sometimes even based on correct information they were not immune from legal action. Additionally, for newspaper D which is owned by the opposition party, apart from the above-mentioned legal challenge which was encountered by all newspapers agencies, it has a further challenge to actually sell its newspapers. According to the head reporter of the organisation, selling newspapers has become a problem since its circulation had been restricted by the government a couple of years ago, to only its party's members and not to the public. He added that even for the party's members, the newspapers must be sold at the party's premises. Government authorities always monitor its circulation and on a number of occasions police forces have confiscated the newspapers. To add insult to injury the government has also reduced its circulation from twice a week to only twice a month.

Other challenges shared by DOE and ENGOs relate to palm oil companies' and the public's perceptions of environmental concerns. According to the DOE's interview participants, industries in Malaysia lacked awareness of environmental issues and only internalised the environmental friendly practices when they are required to so by the relevant legislation. The thoughts of the senior enforcement officer of DOE Kelantan were:

> These proponents don't have awareness towards the environment. Meaning that anything they do just to comply, do anything mere compliance, not sincere. Not they do that for the purpose of environmental protection, no..that the biggest challenge, because what, we visit today, we tell them don't do open burning, we left, and at night they burn. This is a major problem.

Stakeholders also faced the difficulty of getting the MPOI's cooperation as, by and large, Malaysian palm oil companies were not very active in environmental projects. For a small number of companies that had been involved in any ENGOs' projects, their involvement was on a short term basis and they participated when they believed the projects benefited them, but once the projects were over their involvement with the ENGO stopped.

Improving environmental awareness of the general public was also a challenge for the DOE. 'How to make the public aware of environmental issues and how to change people behaviour' and 'When they want to pollute they will first think something (about the environment)', said the senior executive of DOE Kelantan.

In relation to the public, ENGOs had difficulty in attracting members of the public to become members of their organisations. Although it could not be denied that environmental awareness amongst the Malaysian public at large has increased over the past four decades, not many are actively involved in ENGOs, reported the senior executive of Malaysian Nature Society (MNS).

For respondents from the media and ENGOs, access to information was a further challenge that their organisational groups faced. The media respondents were concerned this happened due to two circumstances: first, when sources did not want to provide cooperation; and second, the distance between reporters and the location of the news event. Access of information was worse for the opposition party's newspaper. The head reporter of newspaper D argued that although his organisation had the required permit of publication from the government (Home Ministry), his reporters were unfairly treated. Unlike the pro-government newspapers' reporters, they did not get access passes from BERNAMA (Government Official News Agency). As a result, his reporters were not welcome by the government departments and government-linked companies (GLCs). These organisations usually were not cooperative because did not want to put themselves in a difficult situation, whereby their cooperation with the opposition party's newspaper could be misinterpreted and they could be accused by the government of leaning towards the opposition parties. As for the ENGOs, a majority of respondents admitted they had difficulty to access official government information pertaining to environmental issues. They commented that while it was relatively easy to obtain some information from reports provided by the DOE, much useful information which is classified as 'official secrets' and therefore was not available for them, or the public.

Besides the challenges mentioned above, which were shared by stakeholder groups, there were another three challenges that were exclusive to particular stakeholders. For the DOE, its particular challenge is to improve its environmental officers' technical

know-how in line with changes in environmental technologies as well as the growth of development. As the senior executive of DOE Kelantan put it:

> It means for environmental management, technologies changes…it related. We need to catch up … that environmental knowledge. We have environmental institute (for training) … However, we cannot study alone, if we do so we cannot do our job.

For some ENGOs poor recognition by the government for their organisations was also a challenge. This was especially true for SAM and BRIMAS (Borneo Resources Institute) who are particularly vocal against unsustainable development projects that impact on the environment and local communities. According to the senior officer of SAM, the government did not give recognition of his organisation's positions on environmental and social issues, because there were some in the government who had a 'third world mentality', who believed the role of ENGOs was to support all government projects whatsoever blindly and not to question them. Due to this point of view, SAM and BRIMAS were perceived as trouble-makers.

9.3 Environmental Issues and Problems Caused by the MPOI

When the study participants were questioned about environmental issues related to the palm oil industry, their answers revolved around palm oil plantations and palm oil mills. The environmental issues pertaining to plantations were: deforestation, loss of natural ecosystems, run-off, soil erosion, heavy sedimentation, flooding, air pollution due to open burning, and water pollution. As for palm oil mills, as far as stakeholders were concerned environmental issues were: water pollution from POME, air pollution from black smoke produced by boilers, noise, and offensive odours. Another issue which is intertwined with environmental issues in Sabah and Sarawak is in relation to native customary lands (NCLs).

While all stakeholders recognised the above-mentioned issues associated with the MPOI, not all agreed on the magnitude of the issues. On the one hand, the study participants from the DOE, MPOB and MPOA and the media argued that all these problems, including deforestation were manageable. For example, the representative from MPOA argued that the Malaysian government has allocated a certain portion of land for development, and at the same time maintained some areas as forest reserves, for

example, the National Park. To support his point he argued that at present 60 percent of Malaysia is under permanent tree cover and only 30 percent under oil palms.

On the other hand, ENGO participants argued strongly that the unprecedented growth of large scale plantations has been responsible for significant forest clearance throughout the country. Overwhelmingly, they recognised the expansion of MPOI at the expense of the Malaysian's forest. The problem is a real concern, and they claimed that over the last two decades (since the early 1990s until today) the problem has been more severe in East Malaysia (Sabah and Sarawak), as a result of big companies from Peninsular Malaysia having aggressively expanded their oil palm plantations there.

The WWF senior manager in Sabah said: 'One for example (of negative impact of MPOI) is deforestation, 1.3 million hectares of land (of total oil palms area) in Malaysia is (from) forest the rest is (from) land reform'. The senior executive of MNS also argued:

> [O]verall (palm oil industry in) Peninsula (Malaysia) is not a big problem. We are concerned in Sabah and Sarawak. Because plan to open up a lot of forest to palm oil (oil palm). We (are) concerned for several reasons, one is.. well.. of all we don't think forest should be cleared for the industry, enough idle land elsewhere..... Second a lot of forest they are going to clear is peat swamp. In Sarawak especially which is not suitable for palm oil (oil palm) and it is very dangerous if it cleared.

Both arguments were shared by the senior officer of BRIMAS in Sarawak:

> [W]e also see.. as we have a large tract of oil palms, we see this big major environmental problem because most of the watershed areas as being clear cut ..... and opening a large tract of area of oil palm this will destroy our natural resources.

The problem has become more critical as a result of no suitable land being available in the Peninsular, as well as in the East Malaysian states, which has forced the plantation companies to move to sensitive areas such as peat land, and other sensitive areas which are considered as cheap land in the eyes of the industry. Conversion of such land to oil palm plantations was obvious in Sarawak. As SAM's senior officer argued:

> Then they transfer their estates to the cheap land, where these cheap lands? Peat swamp, even mangrove swamp, below sea level and so forth, government land and the government gives them these lands. They don't see that natural resources have certain important functions, have certain economic values. So conversion of land itself is a big issue we see (mangrove areas and peat swamp) turn to agricultural land, these plantation issues widely occur.

The senior executive of MNS also echoed this predicament:

> [A] lot of forest they are going to clear is peat swamp. In Sarawak especially which is not suitable for palm oil and it is very dangerous if it cleared that is the reason why we have forests fire in Kalimantan.

Opening up forest areas for oil palm has a far-reaching impact where it in turn would affect wildlife which depends on forest for their survival. One case in point is in the Kinabatangan flood plain in the eastern Malaysian state of Sabah, where the establishment of many oil palm plantations replaced forests in the area has affected the survival of endangered species of Proboscis monkeys, Oran Utans and Borneo elephants. The senior manager of WWF in Sabah was seriously concerned about the problem:

> [T]his is the problem we have. Kinabatangan is a classic case, of unsustainable development, the wildlife, this is a map of Kinabatangan (pointing finger to the map on one side of his room) so you see the green one is the forest reserve for the wildlife, so it is not connected from one part to another ... is surrounded by oil palm plantation. So (the problem is) nobody in oil palm sector allowed wildlife corridor.

It was clear to the researcher that the main environmental issue of the plantation component of the palm oil industry was deforestation, and the far reaching impacts associated with it, and this issue received more attention especially amongst ENGOs.

Meanwhile, environmental pollution due to POME effluent was also mentioned in the interviews, albeit that its degree of seriousness is not as great as it used to be. Generally, ENGOs opinions seemed in line with the DOE and other stakeholders (MPOA, MPOB and media). This situation was admitted by the senior executive of MNS:

> Other than that (deforestation) industry has improved a lot from major polluter, I don't think it a major polluter any more. There are still companies which we call them as black sheep. I think as the whole the industry has making efforts to clean up although they are economic reasons for that.

Although palm oil mills in general have improved the standard of their POME, most stakeholders pointed their fingers to small miller operators as the remaining culprits. They were called 'black sheep' by the respondents from MPOA and the senior executive of MNS. 'They are small mills, the small mills always problematic, by and large such a problem still happens in Malaysia, we handle some cases', the senior officer of SAM said.

9.4 The Palm Oil Companies' Environmental Strategies

As far as environmental strategies of MPOI were concerned, participants of all stakeholder groups (with the exception of the MPOA) seemed to agree that most MPOI companies adopted a reactive environmental strategy. The following are their comments when they were asked about palm oil companies' environmental strategy:

> Definitely reactive, not proactive. I visited mills, we put pressure on them…not one time, after two or three times… they complied. Directive after directive, compound after compound, after that some of them went to court. There are two or three palm court cases involved palm mills at present. One of them regularly flouts the law. *(The senior enforcement officer of DOE Kelantan)*

> At the moment, the companies not really care much about the environmental impact of it or socially impact of it. They are even now aggressively expanding.
> *(The senior officer of BRIMAS')*

> I have to say they don't very active at all. A lot of projects we do our partners are with companies almost all of them multi national companies (MNCs). Who have stated environmental policies, at their plants.
> *(The senior executive of MNS)*

Although the industry is not free from environmental problems, most stakeholders agreed that due to legislation the industry had improved its environmental record compared to the worst times in the 1970s and the 1980s. 'As for palm oil industry in Malaysia, its track record is better than most other industries. They have better record but not perfect track record', said the head of a unit at the DOE headquarters.

When the researcher raised the question of why some palm oil mills were unable to comply with the DOE standards, the senior researcher of MPOB stated that a palm oil mill actually could comply with the standard initially, because with the first design of the mill, at either the 30 tonne or 60 tonne capacity, the owner also designed the POME treatment plant according to the expected volume of POME generated by the mill. The design that they sent to the DOE for approval would be for a plant that would be able to cope with the amount of POME generated during their processes. However, problems arose when the mill was operating during a peak crop time in which they needed to process a greater capacity. He added that although it was good for the industry when the mill processed more fruits, more effluent would be discharged and this would easily

surpass the expected discharge amount that the company had submitted to the DOE in its initial plans. The problem is more crucial for private millers because they have limited land and it is difficult for them to establish more ponds to cope with the problem. According to the MPOB respondent, almost all palm oil mills in Malaysia use a ponding system to treat their POME before it is released into the watercourse or applied on land as land foaming, 'Majority, they are using ponding system. I would say 99 percent (of them)', he said.

Only one percent of palm oil mills use new technology where the system utilises active bacteria, which can withstand high temperatures, and very efficiently reduces BOD levels of POME to below the standard set up by the DOE. On the other hand, for big companies an increase in POME effluent during peak crops is usually not a problem because they have land available to increase the number of ponds; and for other big companies who do not have space, they usually do not have financial constraints, and are therefore able to use aerators to supply oxygen and in turn activate bacteria in the ponds to facilitate POME treatment.

Contrary to other stakeholders, the representative from MPOA expressed an opinion that most palm oil companies adopted a proactive environmental strategy. He argued that the Malaysian palm oil companies were taking environmental concerns seriously. He quoted some examples of big companies, which according to him, had taken necessary measures to minimise the environmental impact of their business on the environment. An example of environmentally proactive strategies taken by these companies was participating in the RSPO in which MPOI and other players were trying to adopt the High Value Conservation Forest (HVCF) concept into their businesses.

Although most stakeholder groups (except MPOA) claimed that the majority of MPOI companies were environmentally reactive, the reverse was usually true for big companies, where most respondents claimed they were environmentally proactive unlike their small companies counterparts. Those companies, usually members of the RSPO, have their own corporate vision, and an environmental policy where their environmental strategies on the ground were dictated by this policy.

For those stakeholder respondents who claimed that the MPOI resorted to reactive environmental strategies, the criticisms were directed against both the industry players, and the government (and its authorities). Amongst the reasons related to companies' reactive approach were: companies would incur large expenses; companies' lack of finance and human resources; involvement of outsiders in the business; lack of environmental awareness; greed and corruption; one man show; suspicions of CSR as a Western stratagem to control the industry's growth; top management's lackadaisical attitude and inaction about the environment. Secondly, stakeholders' opinions about the MPOIs environmental strategies related to the Malaysian government itself, for example: the government was perceived as not properly enforcing environmental regulations; having double standards; favouring the industry; giving too much freedom to the industry; and being influenced by market mechanisms proposed by the industry to relax laws and regulations, such as voluntary ISO 14000 and other voluntary mechanisms. Several comments are stated below.

9.4.1 Reasons for Palm Oil Companies' Reactive Strategies

Altogether, there were nine comments that pointed towards the reasons why palm oil companies adopted reactive (not proactive) environmental strategies.

(i) Proactivity costs money

> They don't give priority on that thing (the environment). It involves high cost. For our factories they go for the highest profit they can get. If they can, they will avoid and try to blind (the) government, environmental strategies that they applied only make up, and they will only pay attention on (the) environment if court action taken to them, if not, business as usual for them, back to square one.
>
> *(The senior reporter of newspaper B)*

(ii) Lack of resources (money and manpower)

> For independent mill (usually run by small and medium size companies) to build pond, they don't have land. That is underlying problem when throughput increases, originally when they applied for licence, they don't think for further expansion. Later, during peak season, all look to business, especially when price of CPO high, so they stuck. As for industry we cannot stop. At the end of the year they process over their capacity.
>
> *(The head of a unit at DOE headquarters)*

(iii) Cheaper to pay fines

It is obvious, they paid because it is much cheaper to pay compound compared to profit they generated.

(The head of a unit at DOE headquarters)

(iv) Lack of awareness amongst operators

[I]f they spend a dollar for environmental control, they will make a noise… they say put money into the drain, no income, no profit…. although that contributes to the environment…..because they don't have awareness inside them. …..If they (palm oil players) inculcate environmental awareness inside themselves and happy to see clean river at their mills backyard, and happy to see fish swimming so they can go fishing every evening, if that is their feelings they will take care of it. But now not like that.

(The senior enforcement officer of DOE Kelantan)

(v) Greed, corruption and lure of power

[B]ecause of greed, and corruption and the lure of power as on the top that is where problems come. Once you are there you do not want to stop you want more and more. One million is not enough, two million is not enough, and you have hundred thousands hectares of land you want to increase even more so ..I mean greed. How to get rid of greed is (difficult) question. I mean due to greed people are prevented on how to do it (responsibly).

(The senior officer of BRIMAS)

(vi) Top management inaction

I mean the problem starts with the top in fact not problem in the bottom. You go to oil palm companies, you talk to ordinary staff they understand, we have problem here. Those people who actually bulldozing the native lands, they know it is a problem but they can't do much because…They are natives themselves. And they are working for the companies and (they said) I cannot do much if I don't do this I will out of job. Actually the management needs to be more responsible. *(The senior officer of BRIMAS)*

(vii) One man show

[P]erhaps our companies are often very dependent on one person, the CEO, so they for me they are no culture of this. I have seen Malaysian companies come for talk of corporate social responsibility (CSR) ... they are not very receptive. They often say they see disadvantages for that for their businesses.

(The senior executive of MNS)

(viii) Prejudice about Corporate Social Responsibility (CSR)

They not understood that business involves having a healthy right …the people must be happy. That something that is being noticed elsewhere (but not in Malaysia). Malaysian companies on the one hand, for example, I heard some even said that all things about CSR is mostly a plot by Western countries to control their growth. So this is their concern.

(The senior executive of MNS)

(ix) Businesses run by outsiders

> [P]eople who come to do business in Kelantan are outsiders….and for outsiders who come here they don't care what happen to our river, not their river, after this they move elsewhere. Their boss stays in Kuala Lumpur far away, not in Kelantan, only their subordinates here. These environmental problems, whatever, no problem from them, this is not their state, other peoples state.
>
> *(The senior enforcement officer of DOE Kelantan)*

9.4.2 Comments on the Government in relation to MPOI Companies' Environmental Strategies

A variety of comments on the government and its authorities, in relation to the environmental strategies of MPOI companies, as follow:

(i) Loopholes in enforcement

> I admit that (insufficient enforcement); we have one officer but how many mills we got? Many of mills located in Gua Musang, very far, travelling takes 3 hours time, so in one year (we) can only make two visits for each mill, …. for mill operator, he knows we already visited them twice, so they know we won't visit them again, how they are going to discharge after that no problem for them, they know we won't come after them.
>
> *(The senior enforcement officer of DOE Kelantan)*

(ii) Double standard

> [T]he government also…be double standard. Saying okay (for environmental conservation) at one time but they ask companies to do these things (open up more plantations) …. they also involved with them.
>
> *(The senior officer of BRIMAS)*

(iii) Too much freedom for the industry

> Because of the government policy, it gives more freedom to the industry.....(its our) golden crop, due to this they have much freedom to do many things. So many issues we heard from the industry. As our golden crop, our law to control the industry suppose to be matured enough to deal with it, but that is not the case here. It is still a lot of problem. We heard encroachment issues, NCR issues in Sarawak, not small issues, international issue, internationally known. Encroachment and so forth. Penan's issue is yet addressed.
>
> *(The senior officer of SAM)*

The situation was perceived as being different for large palm oil companies. According to the study participants many of them adopted proactive environmental strategies. The

main reasons that were given by participants related to the palm oil companies themselves. Amongst the reasons given were: they are dictated to by their headquarters' corporate environmental policies; there are no constraints on financial and human resources; there is recognition of the importance of the company's good name. Only a few respondents associated such a proactive strategy with wide pressure from stakeholders such as the RSPO, ENGOs and customers.

9.5 Commitment of Palm Oil Companies to Deal with Environmental Issues

The comments above reflect the views of stakeholder respondents about the MPOI's environmental strategies. As with the environmental strategies themselves, in terms of their views on the MPOI's seriousness or commitment to corporate environmentalism, answers from stakeholders were rather mixed. On one hand, a majority of the study participants from the government authorities (the senior executive of DOE Kelantan, the head of a unit at DOE headquarters, and the senior officer of SEPD) and the MPOA participant believed that the palm oil companies have serious intentions to deal with environmental issues. On the other hand, all participants from the ENGOs, the senior enforcement officer of DOE Kelantan, the MPOB and the media representatives were of the opinion that MPOI companies (with the exception of the larger companies) were not serious enough.

The senior executive of DOE Kelantan said that the MPOI declared that recently, due to his department's actions, the industry took environmental issues seriously and many of the companies had environmental engineers or environmental officers who worked on full-time basis to look after their companies' environment practices. In addition he argued that many of companies collaborate, or are involved in conferences and exhibitions with the Malaysian Palm Oil Board (MPOB). The views of the senior executive of DOE Kelantan were also supported by the senior reporter of newspaper C and the representative of the MPOA. But they reserved their arguments only for the larger players in the industry. The representative of the MPOA argued that big Malaysian palm oil companies, such as company B and F, were committed to corporate environmentalism. These companies, he added, had environmental policies, their environmental practices in place, they were global players in the industry, they practised transparency, and they actually did more than required by the DOE.

Unlike the rest of his government colleagues, the senior enforcement officer of DOE Kelantan believed the MPOI was not serious enough in handling environmental issues. Because of the laws, the MPOI needed to internalise environmental issues if they wanted to avoid punishment. The commitments of the MPOI, according to him, were not at the point of 5 on a 1 to 10 scale in terms of their commitment to the environment. From his experience he saw only a sham. For example, he recalled that when the enforcement officers made official visits to palm oil mills, everything was acceptable, and during the inspection the mill-operators told them of some improvements they had made. However, when he and his colleagues went back to their office and conducted spot checks they found that the operators behaved as they liked. He added that their environmental strategies were a deceptive and dishonest.

The WWF's senior manager was in agreement with the senior enforcement officer of DOE Kelantan, when he related his experience with a large palm oil plantation owner who had estates in Johor (Peninsular Malaysia) and recently had established plantations in Sabah. That businessman, who originated from Johor, had done everything there to comply with EIA, but when he went to Sabah he did not comply with the local requirements. When he was asked why he did not comply, he gave two short answers; first 'nobody will catch me' and second 'not my problem, it's Sabah's problem.'

According to the senior reporter of newspaper B, industries did not give priority to environmental issues. If they could, he said they would avoid complying with environmental regulations, and their environmental strategies were not honest, only a sham, and that these companies would only pay serious attention when the local authority prosecuted them in court. There was no shortage of examples, this respondent argued, as to how the MPOIs environmental strategy is not sincere.

Similarly, according to the senior officer of SAM, at present what actions companies took in terms of the environment was part of a business strategy and not motivated by serious concerns. He gave an example of corporate social responsibility (CSR) such as funding a project for which, according to him, the main aim for businesses to do so was a mere publicity and marketing strategy, with little or no benefits to the environment and communities. The senior officer of SAM tended to belittle, and had a pessimistic attitude to, voluntary mechanisms such as ISO 14000. This is what he said about it:

> ISO (14000)..what ISO has? No audit, nobody audit…we don't look at that. …we do not promote it, not look at all of this (ISO 14000)… that marketing strategy that's it. That is why in reality ISO doesn't tell you we do the best. Only paper work, logo… that all, but the (environmental) problem is still there. And ISO is all voluntary, they pay for it.

9.6 Stakeholders' Approaches to Exerting Pressure on the MPOI

From the interviews it was observed that the main approaches taken by stakeholder groups were different from one another. Those approaches related to their power against the MPOI and nature of their establishment. However in a number of cases, especially on the lower level approaches, there were some similarities amongst them.

9.6.1 The Department of Environment (DOE)

In the case of the DOE, it was clear that as one important regulatory authority, the department uses its coercive power to exert pressure on the MPOI. Legally speaking, there are four levels of action that can be taken by DOE against MPOI: directive, notice, compound, and court action. The degree of severity increases from directive to court action. As the senior environmental officer of DOE Kelantan put it:

> Through enforcement..if for mill effluent we do sampling, if stack we look at Ringelmann Chart, (if we found they not comply) we got back to office, we give them compound, that is the approach we take.. ..we give them directive letter first. But (for) frequent offenders..that not their first mistake..no more directives for them, for mill that yet violate the law okay for us to produce directive letter….. but for big case, serious case we not compound them (but) we bring them to court.

According to participants from DOE there were various methods used by their department to monitor open burning, POME, and air emissions of palm oil companies. These are reflected in the following statements:

i) Enforcement

> Through enforcement, we do sampling, if for mill effluent we do sampling, if (smoke) stack we look at Ringelmann Chart.
>
> *(The senior enforcement officer of DOE Kelantan)*

ii) Inspection

> [I]n terms (of) inspection .we do surprise visit so we don't tell them that we are coming to visit.
>
> *(The senior enforcement officer of DOE Kelantan)*

iii) Frequency of visits

> At least four times a year. But depend on the issue, is there is an issue more frequent….if there is no issue we expected all of them comply with the regulation.
>
> *(The senior executive of DOE Kelantan)*

In addition, to encourage awareness of environmentalism and to provide recognition to MPOI companies the department has also conducted an educational campaign and a competition. 'We have competition, the best managed palm oil mill. We give them award. No other things (besides that)', the senior enforcement officer of DOE Kelantan said.

9.6.2 Environmental Non Governmental Organisations (ENGOs)

Although all the interviewed participants from ENGOs shared the common vision of environmental conservation, they adopted different approaches and strategies to exert pressure on the MPOI, and the federal and state governments, in regard to environmental conservation. Their approaches and strategies, which are shown in Table 9.1, are largely dictated by their organisational philosophies. In general the approaches taken by these four ENGOs to exerting pressure on the industry and the government in dealing with environmental issues in Malaysia could be divided into two categories. Both MNS and WWF preferred close cooperation with the MPOI and the government, while BRIMAS and SAM generally chose confrontational means.

In order to increase corporate environmentalism in Malaysia it was observed that MNS and WWF had established a relationship with palm oil companies through collaboration, consultation and involvement in various activities. For example, MNS got involved in a small project with one big palm oil company. The MNS senior executive said:

> We have not been involved in palm oil companies in regular basis. X (a big palm of company) had been with us for a few times supporting some programmes but all tiny programmes....In the field educational programme.....That's quite a few years ago.

Table 9.1: ***Approaches taken by ENGOs to Exert Pressure on Palm Oil Companies***

Approach	ENGOs			
	MNS	WWF	BRIMAS	SAM
Collaboration / Partnership	●	●	○	○
Empowering communities	○	○	●	●
Legal action / boycott	○	○	●	●
Member of the RSPO	○	●	○	○
Lobbying the government	●	●	●	●
Sit on MPOB Council	●	○	○	○
Communicate to wider audience	●	●	●	●
Link to international ENGOs campaign	●	●	●	●

● Practised ○ Not Practised Source: Based on the researcher's Interview (2006)

By the same token, WWF in Sabah also cooperated with several palm oil companies in a Kinabatangan flood plain project to establish a corridor for wildlife along the river. This project would reconnect various blocks of the Kinabatangan wildlife sanctuary, forest reserve and certain areas of private land for wildlife which would reduce human-wildlife conflict. At the time of the interview with the representative of WWF in Sabah, three palm oil companies who were involved had agreed to allocate a certain portion of their estates for the project.

It was observed that these two ENGOs have resorted to a soft approach and reject any action to boycott or take legal action taken against MPOI. They believe the MPOI is crucial for the Malaysian economy, and at the same time recognise that there are a huge number of workers depending on the industry. Employees as well as palm oil companies would suffer if negative campaigns were launched against the industry. This was what a senior officer of WWF said: 'We don't want to deal with hard approach, we can still talk. Because you have to realise if you say no, if our organisation bans palm oil, boycott palm oil, a lot of people also affected. Of course we don't want that. I'm a Malaysian. Why would I want to do that?'

In addition, WWF also tried to engage the MPOI through its membership in the RSPO, in which the organisation was one of the founding members and instrumental in the establishment of the RSPO. Similarly, MNS sits in the MPOB council in order to engage in dialogue and inculcate awareness of environmentalism in the MPOI. Each ENGO used the RSPO and MPOB as a platform to achieve their vision for better environmental conservation in Malaysia.

Besides direct contact with palm oil players, both of these organisations have also resorted to an indirect approach to pressuring the MPOI. They have tried to influence the Malaysian government to implement better environmental policy. Moreover to put more pressure on the palm oil industry and the government, both ENGOs disseminate facts about environmental issues locally and internationally. In this regards, as an affiliate of WWF international, WWF Malaysia uses its international links to deliver its messages across the globe and at the same time uses its international reputation to encourage various palm oil buyers, both in China and in European countries, to put pressure on the MPOI to be more environmentally responsible.

On the other hand, BRIMAS and SAM have resorted to a critical and confrontational approach. They have not established any collaboration with palm oil companies. Their emphasis is more on working closely with grassroots activists who have been affected by environmental degradation, and have experienced social disruption due to palm oil activities in their native customary lands, especially in Sarawak. These groups have empowered local communities against the MPOI through education and consultation. They have also helped affected communities to take legal action against the MPOI and in a number of cases have provided a community member with legal assistance when they were arrested by the authorities. The BRIMAS senior officer explained:

> [T]hey seek us for legal advice or how to deal with the companies who encroached to their lands. .....some of them don't know what to do. When they come up they seek our advice, besides giving our advice what should they do in terms of action they should take, .. we also provide them awareness raising there where the training comes in, they build up their capacities, awareness of their rights and also communities become more aware and more empowered to defend their lands.

In addition he elaborated:

> And then we also get communities together we form communities organisations, action groups we have this net work now this network known network called as *Tanah Adat Bangsa Asas*. It is a loose network of different organisation or different communities-based organisation and from this one network we try to push pressure on the state I mean change the policy.

SAM's approach is in many ways similar to that of BRIMAS:

> We take various approaches…we refer to our indicator, i.e. community. …Why those community affected by these kinds of development? So we take various means, mechanisations to assist the community affected by those kinds of development. We take legal actions, media.....We also look at law, policy, we educate people what is the environment and so forth. We have less approach on the industry *(The senior officer of SAM)*

Unlike MNS and WWF, both BRIMAS and SAM not only avoided any direct approach to the MPOI, they also distanced themselves from any organisations that are linked with the MPOI. The RSPO is one case in point. The senior officer of SAM said his organisation has been invited to participate in the RSPO on several occasions, but nevertheless SAM showed no interest. However, he said SAM would support other associated ENGOs in the RSPO.

In addition, these ENGOs were also trying to get support from professionals, the public and politicians. They acknowledge that some politicians realise the negative impact of environmental degradation and are sympathetic to the cause of local communities affected by the MPOI. They hope these politicians will be able to make the right decisions for the betterment of the environment and local communities affected by unsustainable development. By doing so these ENGOs have tried to influence the government to amend existing policy or to strengthen enforcement to put more pressure on the industry to be more environmentally and socially conscious. The senior officer of SAM and the senior officer of BRIMAS said they tried to influence the government at both state and federal levels, however they did not elaborate on how successful they were. In the case of palm oil industry, through the interviews with both ENGOs it was observed that both the states and federal governments were biased towards the industry, so it is not surprising that both ENGOs have had little or no effect on government policy. Taking the fact that these two ENGOs on many occasions were at loggerheads with the government over the environmental and social issues, they have been accused by the MPOI, and both state and federal governments, of being trouble-makers and a nuisance. In the past, some of SAM activists were labelled as foreign agents and subversives, those who try to incite hatred of the government and its development projects. Several SAM's activists have been detained by the authorities under the Internal Security Act (ISA).

A further approach used by both SAM and BRIMAS to exert pressure on the MPOI and the government has been through dissemination of information about the environmental and social costs of the MPOI through their websites. They also collaborate with both local and international ENGOs to exert pressure on the MPOI and the government. The BRIMAS senior officer said: '[W]e also have campaigns from our international friends and international ENGOs from time to time play

international leads, we have to take pressure locally we also have local group from peninsula as well, to put pressure on the federal government also international ENGOs put pressure (on the federal government).'

9.6.3 The Media

Unlike the DOE and the ENGOs, the approach of the newspaper companies is to exert pressure on the MPOI by highlighting environmental issues in their newspapers, albeit that these issues are not as frequently reported as other issues (political, economic, and social). This is understandable, since all of the newspaper companies involved in the study are owned by political parties and/or large companies, which are politically connected with ruling parties, and whose agenda is more along the party line. It should be highlighted here that in a semi-autocratic country, Malaysian media is tightly controlled by the government, where most media organisations are government adjuncts. The media's main role is to propagate the government agenda rather than to act as an effective check and balance mechanism. Media in Malaysia traditionally toes the government line, and any negative news about the government and Malaysian companies will not be permitted to be published. Instead, local newspapers have been used by reporters and those connected with the industry to counter negative allegations against the government and Malaysian companies.

Despite restricted publication on environmental issues, where by and large environmental issues are not on the front page, the newspapers do take precautions in their reports. If newspapers report any environmental problems such as air and water pollution caused by a palm oil mill, it is not the policy of these media companies to expose the name of company responsible, in order to avoid legal action against themselves. Respondents from the media said information they obtained from public complaints, as well as their own observations in the field, was not necessarily accurate as those sources of information were not reliable enough. After all, they did not have authority to report situations. As the senior reporter of newspaper A, a pro-government newspaper, said:

> The fact is, not only true for environmental issues, all like that. First, let say mill A, local community claimed, they said the mill polluted the environment, that is the issue, we go there to report, we interviewed local community, however, opinion from local communities alone is not enough to say mill A pollutes the environment.

> They have no authority to say that. They not even have any authority to say mill A so and so because this is the system in Malaysia, only Department of the Environment has the authority to say so.

He added:

> We only mentioned a mill. Because only a mill has its operation there pollutes the environment. If we say mill A pollutes the environment, who say so? local community. Tomorrow Department of the Environment investigates and found out no pollution, effluent level that discharges according to the regulation, we will be sued. The risk is there.

9.6.4 The Malaysian Palm Oil Association (MPOA)

According to the respondent from MPOA his organisation exerted pressure on its members to be more environmentally responsible through a combination of the following approaches. First, by being a founding member of the RSPO. Second, it is actively involved in the Environmental Quality Council (an advisory body to the Ministry of Science, Technology and the Environment). Third, the MPOA is also involved in activities in relation to the social aspects of the OSHA. Fourth, it encourages all its members to comply with all mandatory environmental requirements. Fifth, the association also actively organised seminars, talks and conferences related to corporate environmentalism. Sixth, the association also launched its environmental charter. Lastly, the MPOA periodically conducts quality meetings with members where environmental issues were part of the discussion.

Through the above-mentioned approaches, the MPOA's interviewed participant believed that directly and/ or indirectly his organisation would increase its members awareness of corporate environmentalism and at the same time encourage them to adopt environmentally friendly practices.

9.7 The Extent of Stakeholders' Pressures on the MPOI

The extent to which the stakeholders exert pressure on the MPOI varies, dependant on which of the different stakeholder groups is involved.

9.7.1 The Department of Environment (DOE)

To the question of *to what extent does the DOE exert pressure on the MPOI to be more environmentally responsible* there were two mixed answers given by these stakeholder representatives. Most the respondents from DOE claimed that through various means of enforcement they had exerted pressure on palm oil companies to be more environmentally friendly and to comply with the regulations. The following quotes shown respondents were positive about their approaches:

> I can say our approach exerts pressures, puts pressure on them.
> *(The senior enforcement officer of DOE Kelantan)*

> We think significant…I'm positive very significant…… at present, due (our) action (they are) committed…seriously. They have special officers, environmental officers, engineers who work full time.
> *(The senior executive of DOE Kelantan)*

Commenting on the increasing pressure exerted by his department on the MPOI, the Head of a unit at DOE headquarters said that at one stage in the 1980s and the early 1990s punishment for those who violated the environmental law was not severe, both because judges at the time imposed light fines, and also because of less stringent laws. At that time RM 10,000 was usually the highest fine imposed by the judges even though the highest punishment according to the law was RM 100,000. But today the fines reach half a million Ringgit, so judges can impose far greater fines compared to those days. He added that previously palm oil companies seemed not to worry particularly about the penalties as they could afford to pay, because they knew that the fines were very low, at only a couple of thousand Ringgit. According to him, under the new regulations palm oil companies are very concerned because his department can impose heavy fine on the culprits; 'the bite is really there', he said. There was a case of open burning in Kelantan where the court fined the responsible company the sum of RM 180,000, reported the senior executive of DOE Kelantan.

Another issue that was discussed during the interviews was *how the power of the DOE has been diluted*. While the DOE's coercive power puts pressure on the industry to comply with the environmental legislation, there were a number of reasons why the DOE's authority has been weakened, which in turn affects its performance. Firstly, this is due to the lack of enforcement, whereby enforcement is still patchy in many areas.

According to the senior environmental officer of Kelantan, although it is a requirement of his department to visit palm oil mills 4 times a year, due to lack of staff, and compounded by poor accessibility, enforcement officers are only able to make two visits a year.

This officer's statement was confirmed when the researcher looked at the DOE annual reports of number of mills, and the enforcement visits throughout Malaysia from 1999 to 2003 (Table 9.2). On the average DOE officers were only able to inspect mills twice a year - 50% short of the target.

Table 9.2: ***Number of Mills and Number of Inspections (1999 -2003)***

Year	1999	2000	2001	2002	2003
No. of palm oil mills	337	343	354	364	369
No. of inspections	493	627	583	471	699
Ratio of inspection per mills	1.89	1.83	1.65	1.29	1.89

Source: DOE Annual Reports, 1999, 2000, 2001, 2002 and 2003

Secondly, the DOE was quite lenient and has given a great deal of flexibility to palm oil companies for too long. This was what the senior enforcement officer of Kelantan said:

> Palm oil mill history begins in 1974, long time ago, no reason for them not to comply... because the industry has been around for some times, we gave flexibility too long, too long. Even small BOD level of non compliance, we should take action, we could not allow anymore, we won't tolerate.

Even though the DOE has the authority to close down any errant palm oil mills, the fact that is this is the last thing the authority would do. For instance, in Sabah, at the time of the study interview, none of palm oil mill companies had been prosecuted and if fined they had a very lenient penalty imposed, explained the senior officer of SEPD.

Thirdly, although there is a provision to jail the director of company responsible for violations of environmental regulations, the law firm respondent reported that such a thing never happens in Malaysia. Up until now, there is not a single case of those at the top management level of the MPOI being sent to jail for these violation. Although they could be fined up to half a million Ringgit, or receive a sentence of five years' imprisonment, the fact is that convicted companies were punished by a fine of not more than RM200,000, and when they appealed and argued their economic and social

contribution to the country and communities, more often than not the court would impose a lesser amount of fine. The head of a unit at DOE headquarters admitted:

> They now aware on environmental regulations. But to what extent they aware...we (think)..perhaps to say they afraid enough....is not. Why I say so, because ...no matter even one day (jail on those convicted environmental laws). If we have such a judge who can impose that kind of punishment, we imprisoned them, let say we prosecuted one mill and brought the case to the court, and jailed company director, tomorrow all mills afraid, the problem is, no such a case. So it means now, I don't know, perhaps judge don't have such consideration to impose such a punishment, perhaps they don't see to that extent to give a proper punishment.
>
> *(The head of a unit at DOE headquarters)*

9.7.2 Environmental Non Governmental Organisations (ENGOs)

In the case of ENGOs, although various approaches had been taken by the four ENGOs in the study, by and large their respondents admitted to a degree of powerlessness over the MPOI in terms of environmental management. They exerted only weak pressure on the MPOI to be more environmentally and socially responsible, even for those who had a direct contact or collaboration with the MPOI. They could not help but admit:

> [W]e don't really exert pressure. In MNS we try to work along side companies so we try to show by example. And for companies who work with us they often find benefits of getting a lot of awareness, support and accolade around the world. And companies who don't (work with us) we hope, will feel embarrass that they being left out. That's all we can do. MNS is not getting involved in any companies like that. We sit under palm oil board we try to convince companies to do the right thing but we focus more on (the) government, to work with the government, a lot to do with the land use.
>
> *(The senior executive of MNS)*

The situation was also true for BRIMAS, 'Ours is more on building communities, we (em)power (community). As for our organisation we actually cannot do much', said the senior officer of BRIMAS.

As for SAM, though in the past they managed to generate significant support from the public, and public pressure forced the government to change its policy and abandon controversial development projects (such as the cases of Bukit Merah and Penang Hill) and logging activities (in Ulu Muda, Kedah), in the case of palm oil industry development the organisation itself has little or no impact on the government's policy. Nevertheless, its senior officer claimed their efforts have political influence on decision

makers. However the researcher believes that this influence is issues based, since when it comes to the palm oil industry SAM's representative could not provide strong evidence as to what extent SAM exerts direct pressure on the MPOI and the government to change their policies. In the case of indigenous people against palm oil industry in Sarawak, SAM's senior officer claimed his organisation's efforts had empowered local communities to exert pressure on the MPOI and the state government, which again indicates that his organisation's pressure is actually indirect.

9.7.3 The Media

As with ENGOs, all participants from the media admitted that their organisations did not have any power against the MPOI directly. However, in terms of indirect media pressure on the MPOI, there were two opposite views given by their participants. On the one hand, interviewees from newspapers A and C believed that, although they did not have specific influence, they could exert pressure on industries and relevant authorities through their news reports. On the contrary, interviewees from newspapers B and D were rather pessimistic about that.

Interviewees of media A and C argued they could exert influence on the MPOI through their reports. According to them, when they highlighted or reported environmental issues on their newspapers, they made people aware of environmental issues, and hoped relevant environmental authorities would take action especially when they had pressure from people at the top, or from the general public.

> The fact is we don't have (direct) power to force people to do their job. But sometimes we made aware, give awareness….when media discloses any (environmental) issues, okay relevant authorities will start to take action because they got pressure from above. For example here, first it happens in one place, A, this is under whom? Okay local authority, okay it will take action. After that, okay DOE will take action. Okay local authority under state government, so state government will take action. Definitely a state's exco (senior state assemblyman) will question the local authority, 'what the problems? This is your area.' And at the same time DOE, ministry secretary, will also take action. Because ministry will ask, director at federal level will ask state director, and in turn stake director will ask his subordinate at district level. ….all will question because at the end of the day, minister will ask about that. Because reporter will ask that Minister on that issue. 'What your action?', so in reality, the public prefer to report to us, because they see media can get the job done faster. Our job is to exert pressure, so we help these authorities do their jobs.
>
> *(The senior reporter of newspaper A)*

He elaborated the point further:

> Of course we put pressure, because sometimes we mentioned their names. We mentioned their names when the authority went to their premises. Let say after we made a report, let say a mill in this village, so the next day what happened? Department of the Environment went there to investigate; okay DOE would go there, so we went together to the place. Normally we would do follow-up so we go together with the Department. We reported when Department of the Environment visited that area, and we also interviewed management of the mill.

Although the interviewee from newspaper A argued that the media had influence, at the same time he admitted media pressure was quite low and not much has changed in terms of the practices of authority and companies on the ground. From this perspective environmental reporting in newspapers is successful in increasing awareness amongst readers and provided information about the environment, but not to the extent that it can exert pressure on the industry and the government to be environmentally responsible.

> [T]he fact is like this, whether industry or authority, actually like 'a hammer and a nail' (Malay proverb), every time you knock the hammer, every time the nail goes inside the wood. That what is happening now. For example, no matter what happens, where and whatever issues, only when it is disclosed on news, either in newspaper or television, people will react and take action. If not, no action taken because they (the authorities) say no complaint. No complaint, (as for those who wanted to complaint) no use to complaint to the government offices (authorities), because the public don't know. That is the situation.
>
> *(The senior reporter of newspaper A)*

On the other hand, the senior reporter of newspaper B believed his newspaper exerted little or no influence since the public do not care much about the environment. He argued: '[W]e expose but the public awareness of (the) environment is the same, they don't care…In environmental case, let say a mill (pollution), who care? local community?, dust particles flying around their village, we as outsiders feel sorry for them, they don't care. Level of awareness is still low.' Despite limited pressure from the media against Malaysian industry, he agreed newspapers should continuously highlight environment issues, albeit he admitted his newspaper gave less priority to the environment than to other issues such as politics, social, economy, sport.

As for the opposition party's newspaper (newspaper D), its respondent believed his organisation did not exert any pressure. In his opinion, owners or management of the companies responsible for environmental problems would become concerned about the

environment only when mainstream newspapers reported negatively on their companies.

9.7.4 The Malaysian Palm Oil Association and Board (MPOA and MPOB)

Representatives of both the MPOA and MPOB admitted that they did not have power against the MPOI in terms of environmental issues. In the former case, the researcher asked if there were any measures taken by his organisation in order to achieve the components of the environmental charter introduced by the organisation, or to take any action against the members who continually flouted the environmental law? He had to admit that since it is voluntary for its member to be signatory of the charter, there is no attempt to set a deadline for all members to adhere to all of the charter's components. Furthermore, the interviewee said MPOA did not have power to expel any members who failed to comply with the environmental laws and regulations from the organisation. According to the MPOB representative, its organisation does not have any power over palm oil mills, because any environmental issues are under the jurisdiction of the DOE. His organisation can only stop a mill's operation if it OER (Oil Extraction Rate) is lower than the standard, if a mill runs its operation over capacity, or there are too many complaints from the public about it. Even though those activities have environmental impacts, the MPOB plays its role more in R&D to find better technology to reduce a palm oil mill effluent and smoke emissions. He pointed out that although a new technology has been developed by his organisation, it depends on the management of mills and their companies, whether they want to adopt it or not, since it's adoption is voluntary.

9.8 Accessibility of Environmental Information

When the respondents were asked about how easy it was to obtain environmental information from palm oil companies, the respondents of DOE, MPOB and MPOA said it was not a problem for them. However, for both the ENGO and the media groups, overwhelmingly their respondents said otherwise.

DOE accessibility to the MPOI environmental data came as no surprise at all, as palm oil companies are required under the law to provide environmental information

periodically to the department. The environmental authorities have the power to ask for information, to have access to their premises, and they have the power to inspect environmental records. Failure to do so means that the companies may be subject to prosecution. For example, every month palm oil companies are required to submit readings of BOD levels of POME being released into the watercourse, and a smoke stack chart. As for the MPOA, when the researcher asked how his organisation gained access on environmental information of its members, this respondent said that it was available from annual reports and companies' websites. His answer is questionable because not all palm oil companies include environmental reports in their annual reports and websites.

As a result of the inaccessibility of palm oil companies' environmental data, ENGOs and the media relied on other sources, whether from someone inside the palm oil companies, or from government departments, although this is not easy to do so as the government agencies sometimes did not want to release the information. This clearly shows that the players in the industry exercise little transparency. This is what the representatives of BRIMAS and SAM said:

> Directly is very difficult. I meant… normally information we get is where their lease overlapping and the companies who are shareholders, reports on the environment, EIA reports, and we asked somebody inside also. That is how we get information but if directly we ask them information they won't (give).
> *(The senior officer of BRIMAS)*

> Normally if we wanted some information about palm oil companies we went to the government. However, at present the government policy not to release information, and the information is not disclosed, not to disclose to the public (due to) OSA (Official Secret Act). Once we approached DOE and others asking EIA, that under OSA. *(The senior officer of SAM)*

As an employee of the opposition party media, the interviewee from newspaper D admitted that his organisation does not have access to either GLCs and non-GLCs. This was understandable, however, this problem was also shared by pro-government newspapers, A, B and C. On their own, respondents admitted that it was difficult to get cooperation from companies that were responsible for environmental problems. As a result they could only make observations from outside companies' premises, or relied on information from local communities who were affected by the environmental problems.

In order to gain access to information, these mainstream newspapers went to the companies responsible in the company of local authority representatives, or sometimes with relevant government ministers. 'So far when we went with the authority, no problem, they cooperated', said the senior reporter of newspaper A.

9.9 Stakeholders Relationship with Palm Oil Companies

Unanimously, interviewees from DOE, MPOA and MPOB admitted that they had a good relationship with palm oil companies. They had regular dialogues with palm oil companies' representatives. They said the industry players were cooperative, and there was no problem for these stakeholders to get assistance.

On the other hand, ENGOs and the media had a mixed relationship with palm oil companies. As far as the relationship between ENGOs and palm oil companies was concerned, their relationships largely depend on the approaches of ENGOs. Both of the respondents from BRIMAS and SAM said their organisations had a negative relationship with the MPOI. According to the senior officer of BRIMAS, his organisation was perceived as an illegitimate shareholder- both palm oil companies and the state government tried to find faults in its organisation to silence its opposition. He added that up until now there have been hundreds of court cases involving the MPOI and indigenous people in Sarawak where BRIMAS provides legal assistance to the latter.

Even for MNS and WWF who both have a direct relationship with palm oil companies, the interviewees admitted that not all their dealings with palm oil companies were positive ones:

> Depend, the most progressive companies they look at NGOs like WWF as a way to find solution to become sustainable developer. Some of them are genuine. The genuine companies want to go for sustainable development. Look at NGOs like WWW as friend. That ones who say they don't want sustainable development will not look at NGOs like us as friend. They the ones who don't care about sustainable development, because they always claim like many wildlife in our plantation (so not need to worry).
>
> *(The senior manager of WWF, Sabah)*

The relationship between media and palm oil companies was described as a situational based one. If the news reports favoured companies, palm oil companies were willing to provide information, but when there were environmental problems related with them, and the media would report against them, the media was not welcomed.

9.10 Proactive Environmental Strategies and Competitive Advantages

Overall, stakeholders' respondents believed there was a positive correlation between a proactive environmental strategy and competitive advantage. Table 9.3 shows six categories of keywords of competitive advantage from the interview transcripts.

Table 9.3: ***Category of Competitive Advantage***

Category of Competitive Advantage	Keywords
1. Good reputation	• Improved company reputation • Build up image • Set good example
2. Improved media coverage	• Avoid negative report • Good publication
3. Improved community relations	• Better support and welcome by stakeholders • Local communities appreciated • People are willing to work • Avoid public complaints.
4. Complied with regulation	• Avoid prosecution
5. Increased efficiency	• Reduced operation cost
6. Market opportunity	• Differentiation • Selling point • Open up market

Source: Based on the researcher's Interview (2006)

Of all competitive advantages mentioned by the respondents, the top three were good reputation, improved media coverage, as well as improved community relations The other competitive advantages, compliance with regulations, cost reduction and market opportunity were less discussed by respondents. The following are some quotes related to competitive advantages described above.

<u>Good Reputation</u>

> [T]his impact improves their companies reputation….. Reputation will up, now people are talking about certifying oil palm so if that really comes to place, I mean they have to be…more responsible, socially and environmentally.
>
> *(The senior officer of BRIMAS)*

Improved media coverage

> [W]hen they comply their names not in newspapers.
> *(The senior executive of DOE Kelantan)*

> Our report gives publicity to their products.
> *(The senior reporter of newspaper C)*

Improved stakeholders relations

> I strongly believe that environmental responsibility will be a major competitive edge…because I think the whole world recognise environmental problems. So companies which have that demonstrate they have responsibility would be better supported, better welcome by stakeholders.
> *(The senior executive of MNS)*

Compliance with regulation

> [W]hen they complied, they will not be prosecuted in court.
> *(The senior executive of DOE Kelantan)*

Efficiency- Cost reduction

> [I]f they recycle their waste, they can use again, make fertilizers, not need to buy, they can avoid (spending money for buying fertilizers).
> *(The senior executive of DOE Kelantan)*

Market opportunity

> [It] actually open-up their market to Europe.
> *(The senior officer of BRIMAS)*

> [G]reen products, green business they can use as selling point….However, depend on people who concerned, they need to find environmentally friendly market. *(The senior executive of DOE Kelantan)*

9.11 Ways to Increase Corporate Environmentalism in the MPOI

When the respondents were asked about ways to increase corporate environmentalism in the industry in Malaysia, almost all respondents wanted a very strong government commitment on the environment. In terms of environmental laws, they suggested proper implementation, stringent legislation and better enforcement of environmental regulations.

This was what the senior officer of SAM said:

> Government policy itself must be awakened, must have better policy, policy must stringent enough. Because at present, our government policy is what including in WTO (World Trade Organisation), the latest is FTA (Free Trade Agreement), they want to loosen the law to promote industry and in turn promote economy. For us when the government loose up the law, they relax policy and so forth…ideally they relax the law to give more room for economic activities but in future it effects on people, it is more dangerous, so (the question is) either they are going to go for sustainable future or destructive future? The best way (to increase corporate environmentalism) is to strengthen the law and policy. If they do that, industry could not help but to comply. The industry must comply

When it came to the government authority's power as well as monitoring, an interviewee proposed a mandatory requirement for each and every company to apply for ISO 14000 certification:

> [T]he government should enforce the law, unfortunately we(sic) don't have enough enforcement officers. They cannot do surveillance or monitor all these plantations and mills. But you can do this…. the government said to renew your licence you must show your ISO 14001 (certification). And make sure that you renew every year. (And due to this) enforcement is done by companies themselves. …it is easier for the government to monitor them. Otherwise, the government needs thousands enforcement officers, but still inadequate.
>
> *(The senior manager of WWF, Sabah)*

Moreover, the interviewee from the opposition party newspaper (newspaper D) considered that government action to increase corporate environmentalism should be through amendment of repressive media acts, such as the Official Secret Act (OSA), the Printing Presses and Publication Act, as well as official intimidation through the Internal Security Act (ISA). By so doing it would give more freedom to media to play its due role professionally and in turn would improve corporate environmentalism in the country, he summed up.

Together with enforcement, other ways the government could increase corporate environmentalism according to respondents were through awareness, education and negotiation.

> [W]e must do both enforcement and awareness. That means we give awareness to them on certain aspects, and we give reasons and effects of their misbehaviour…not to say you can't do this and that, if we don't tell them the consequences they don't understand. So we provide them scenario, consequences, to make them understand and this is followed by negotiation, we include together negotiation….negotiation is good if we practise it…. For example, if we visit them today we negotiate, we give them awareness, but if they make (an) ordinary offence, that we can't forgive them, we need to take legal action, but if they do (an)

> unusual offence which not often happen, but happen on that day we negotiate, and discuss the problem.
>
> *(The senior enforcement officer of DOE Kelantan)*

To further encourage corporate environmentalism, respondents also suggested some sorts of incentives and rewards be allocated by the government to environmentally proactive companies. Among other incentives mentioned were tax relief, monetary rewards, grants as well as technical assistance. They argued that at present there was no clear evidence that the government rewards proactive companies accordingly. Given the situation where companies gain no benefits through being environmentally friendly, except to comply with the regulations, it seems unsurprising that many palm oil companies are reactive in an environmental sense.

Besides the government, some respondents recognised that customer, especially domestic ones, had their own role to play to encourage corporate environmentalism in the industry. Customers according to them must be environmentally conscious and be willing to buy environmentally friendly products at slightly higher price (compared to ordinary product). As the senior executive of DOE Kelantan said:

> As for consumers themselves, must support this (environmentally proactive companies), for example, in Europe where customers (are) more environmentally conscious, more outside Malaysia….consumers want green products. …so must be the same in Malaysia. If there are only 4 or 5 people demand such product…..not worth. It means public awareness of such product is important. If the price (green product) too expensive cannot. The price must be rational.

Moreover, some suggestions of the stakeholders were directed at MPOI, in that environmentalism should begin from the palm oil companies themselves. This self regulation they believed to be the best way to ensure the industry's environmentalism. 'I mean it must start from company itself' said the senior officer of BRIMAS. The same was echoed by his ENGO counterpart:

> [L]et say companies do such a thing (self-regulated). Not need for us to worry or not need for us to monitor them, because they are not going to create problem…. no need for us to worry. They know corporate responsibility, they understand, (for example) there are some Japanese firms run their business in Malaysia. If we go (to their premises) we don't know where to find fault. They have high self regulation to the extent that they create no problem and not need for us to worry about them. If that is the situation, so no issue. What makes NGOs worry is due to various (environmental) issues created by our companies. They don't have their own self regulation.
>
> *(The senior officer of SAM)*

9.12 Comparison and Consolidation Quantitative and Qualitative Data

In the previous sections (Chapters 7 and 8 and early part of Chapter 9) analysis of quantitative and qualitative data was conducted individually. In this section, the results of analyses of the both methods will be compared to see whether they are similar to or different from one another. If there are any differences, plausible explanations will be given. Once the data are compared they will be consolidated, whereby both qualitative and qualitative data will be integrated into a coherent whole, in order to answer the research questions.

In this study, there are four research questions pertaining to corporate environmentalism in the MPOI which were addressed by both analysis methods:

- what types of environmental strategies have been adopted by the industry – in terms of proactiveness?
- how does the management of each strategy proactiveness group perceive pressure from various types of stakeholders?
- is there any difference in environmental effectiveness as a result of the type of environmental strategy adopted by the MPOI companies?
- is there any difference in competitive advantages as a result of the type of environmental strategy adopted by the MPOI companies?

Each of these issues will be discussed in turn.

(i) Palm Oil Companies' Environmental Strategy Proactiveness

Overall, suffice it to say that there is a strong agreement between quantitative and qualitative analysis pertaining to environmental strategy typology. All of the four minimalist strategy companies in the quantitative analysis were classified under the same category in the qualitative analysis. However, small discrepancies were observed in the other two strategy categories; Company D and H, which were respectively categorised as intermediator and proactivist in the quantitative data were classified in the opposite categories in the qualitative analysis. Except for these two changes, other companies maintained their positions in the both two methods. Since classification of environmental proactiveness typology in the qualitative data was a comprehensive

inspection of each company's operational, tactical and strategic level strategy, the research will use this classification to answer the research question.

(ii) Environmental Strategy Proactiveness and Stakeholders' Pressure

The results of the perceptions of stakeholders' pressure by companies in the three environmental strategic proactiveness groups are shown in Table 9.4. As with the classification of the companies into environmental strategy proactiveness groups, the qualitative data tended to support the findings of the quantitative data. In both methods, the same pattern of perception of stakeholders' pressure against company proactiveness was observed. The more proactive the companies, the more they perceived pressure from a wider range of stakeholders. For both intermediator and proactivist companies, apart from regulatory stakeholders, they perceived high pressure from a number of primary and secondary stakeholders. However, the reverse is true for minimalist, where regulatory stakeholders were the only high pressure stakeholder.

Table 9.4: ***Stakeholders' Pressures against Companies' Environmental Strategy Proactiveness in Quantitative and Qualitative methods***

	Quantitative Research			Qualitative Research		
	Environmental Proactiveness					
	Minimalist	Intermediator	Proactivist	Minimalist	Intermediator	Proactivist
Company	A, C, G, I	E, **D**	**H**, B, F	A, C, G, I	E, **H**	**D**, B, F
Stakeholder Pressure						
Regulatory	●	●	●	●	●	●
Primary						
Shareholders	○	○	●	○	○	○
Financial institution	○	○	○	○	○	○
Insurance company	○	○	○	○	○	○
Employees	○	○	●	○	○	●
Customers	○	○	●	○	○	○
Suppliers	○	○	●	○	○	○
Distributors	○	○	●	○	○	○
MPOA	○	●	●	○	○	○
MPOB	○	●	●	○	○	○
Secondary						
Local communities	○	○	●	○	○	○
Media	○	○	●	○	○	●
Competitors	○	○	●	○	○	●
ENGOs	○	●	●	○	●	●

● High Pressure ○ Low Pressure

Significant difference between proactivist and minimalist.

Despite overall agreement between the two methods, a closer observation showed there is a clear difference between results of the two analyses of primary stakeholders, notably for intermediators and proactivists. In the quantitative data, intermediators showed high pressure from the MPOA and MPOB, but both of these were indicated as weak stakeholders by the qualitative data. As for proactivists, in the quantitative data, all primary stakeholders (with the exception of financial institutions and insurance companies) were found to exert high pressure. However, hypothesis testing (Hypothesis 2) showed that out of seven high pressure stakeholders, only four (employees, customers, distributors and the MPOB) significantly differed from proactivist to minimalist. Qualitative data analysis reduced these numbers, where only employees, notably top management, were found to be a high pressure primary stakeholder. Unlike the quantitative data, there was no evidence found in the interviews that other stakeholders exerted pressure on the proactivists. Because qualitative research has more weight compared to quantitative research, since the researcher can probe more deeply as to how stakeholders exert pressure on their business, the researcher reached the conclusion that of the primary stakeholders in the study only top management exert pressure on these proactivist companies to exercise environmental strategies.

On the other hand, only slight differences are observed between the perceptions of secondary stakeholder pressures in the quantitative and the qualitative data. In the former, all secondary stakeholders - local communities, media, competitors, and ENGOs - were perceived by proactivist as high pressure stakeholders. But in the latter, local communities were considered to apply weak pressure. Judging from these findings, the researcher concludes that all secondary stakeholders, except local communities are high environmental pressure groups for the MPOI.

(iii) Environmental Strategy Proactiveness and Environmental Effectiveness

Table 9.5 shows environmental strategy proactiveness against environmental effectiveness for both quantitative and qualitative data. Unexpectedly, in quantitative data, respondents of all strategy proactiveness categories claimed they gained high effectiveness from their environmental strategy. It seems there is no differences amongst proactivists, intermediators and minimalists. The researcher is of the opinion that the respondents tended to exaggerate their answers on survey scale. However,

hypothesis testing (Hypothesis 4) showed that there is a significant difference between environmental effectiveness measures amongst the three strategy proactiveness categories, and further testing found that only two environmental effectiveness measures - high level of investment and high environmental disclosure to stakeholders - significantly differed between proactivists and minimalists.

Table 9.5: ***Companies' Environmental Strategy Proactiveness against Environmental Effectiveness and Competitive Advantage in Quantitative and Qualitative methods***

	Quantitative			Qualitative		
	Environmental Proactiveness					
	M	**I**	**P**	**M**	**I**	**P**
Company	A,C,G,I	E, **D**	**H**, B, F	A,C,G,I	E, **H**	**D**, B, F
Environmental Effectiveness						
Complied environmental law	●	●	●	●	●	●
Investment in new technology	●	●	●	●	●	●
Reduced operational cost	●	●	●	●	●	●
Few complaints in 5 years	●	●	●	●	●	●
Less environmental accidents	●	●	●	●	●	●
Effective environmental system	●	●	●	○	●	●
Good relationship with wider stakeholders	●	●	●	○	○	●
High environmental disclosure	●	●	●	○	○	●
Environmental awards	n/a	n/a	n/a	○	○	●
Competitive Advantage						
Lower insurance premiums	○	○	○	○	○	○
Cheaper finance	○	○	○	○	○	○
Improved community relation	●	●	●	○	○	●
Increased staff commitment	●	●	●	○	●	●
Improved material efficiency	●	●	●	●	●	●
Positive pressure group relations	●	●	●	○	○	●
Improved media coverage	●	●	●	○	●	●
Assured future compliance	●	●	●	●	●	●
Environmental leader	n/a	n/a	n/a	○	○	●
Market differentiation	n/a	n/a	n/a	○	○	●

M = Minimalist, **I** = Intermediator, **P**= Proactivist

● Yes ○ No n/a = not available

Significant difference between proactivist and minimalist

The same pattern was observed for qualitative data, where respondents in all strategies claimed they achieved environmental effectiveness from all items in the study except for high level of investment and high environmental disclosure, where proactivists showed higher effectiveness. In addition, during the interviews the researcher also

found that proactivst companies gained more environmental awards. Based on these comparisons the researcher concluded that more proactive companies are more environmentally effective, especially in terms of high level investment in new technology, high environmental disclosure, as well as achievement of environmental awards.

(iv) Environmental Strategy Proactiveness and Competitive Advantage

Table 9.5 shows competitive advantages perceived by respondents of various strategies under both analytical methods. Both sets of data unanimously indicated that no competitive advantage, in terms of cheaper finance or lower insurance premiums, was achieved by companies in any of the environmental strategy categories. However, some differences were observed for other competitive advantage measures between the two analytical methods. In quantitative analysis (except for lower insurance premiums and cheaper finance) respondents of all strategies claimed they gained competitive advantage for all the items in the scale. And hypothesis testing (Hypothesis 5) showed no significant difference between strategies. This indicates that whichever environmental strategy the palm oil companies adopted, they claimed that they gained competitive advantages. In other words, environmental proactiveness is not responsible for competitive advantage. Minimalists seem to gain the same competitive advantage as proactivists. Arguably, there are two reasons for this. First, as previously mentioned in the analysis of environmental effectiveness, the researcher believed respondents tended to exaggerate their answers. Second, the researcher suspects that respondents have a limited or different understanding of the term 'competitive advantage'; perhaps for them it simply meant 'advantage', which for a layman is synonymous with benefits. But nevertheless, in management terms competitive advantage means any advantage that a company gains, which other companies are unable to duplicate the benefits of, or find is too costly to imitate (Hanson, Dawling, Hitt, Ireland & Hoskisson, 2002 p.5)

This was clarified, when the researcher compared qualitative data (interviews) from respondents of proactivist companies with those of intermediators and minimalists. He found proactive companies gained competitive advantage in terms of improved community relations, improved staff commitment in environmental issues, positive pressure groups relations, and improved media coverage, none of which were reported

by the minimalist companies' respondents. Additionally, in the interviews the researcher also identified another two measures of competitive advantage exhibited by proactivists, being that fact the companies had an identifiable leader in environmental management, as well as having market differentiation. The interviews with the MPOI's stakeholders supported the proposition that environmentally proactive companies would enjoy competitive advantages compared with reactive companies. Judging from the analysis of qualitative data coupled with a concern of exaggeration of the survey answers, the researcher concluded that proactive companies gained competitive advantages from their environmental strategy.

9.13 Summary

Interviews with stakeholder participants provided an insight into palm oil industry environmentalism and stakeholders' pressure in Malaysia. By and large, stakeholders admitted to some environmental issues associated with the industry. The real concern of stakeholders, especially ENGOs, was deforestation and its far reaching impacts. They argued convincingly that the unprecedented growth of the industry undeniably took place at the expense of Malaysian rain forests. Palm oil companies, according to stakeholders, were reactive in their environmental strategy, with the exception of the large companies. In terms of stakeholder pressure, as expected, the analysis showed regulatory stakeholders especially the DOE, exerted the highest influence on the industry. This authority exercises traditional command-and-control regulatory mechanisms to regulate air emissions and water discharge, open burning, and methods of applying pesticides. There was a clear evidence of little or no cooperation between stakeholders and palm oil companies in environmental projects. A further finding also showed palm oil companies exercised low transparency; environmental information was not usually available for the public except for the government authorities. In terms of competitive advantages, most stakeholders believed there was a positive relationship between an environmentally proactive company and competitive advantage. A good reputation, improved media coverage and community relations, staff commitment, environmental leadership in the industry, as well as market differentiation were named as major advantages. When they were asked how to increase corporate environmentalism in the industry, overwhelmingly stakeholders suggested better

regulatory enforcement, however, other mechanisms such as company self regulation and customer support were also mentioned.

Meanwhile, as far as comparison between and consolidation of quantitative and qualitative data were concerned, there are three main findings. First, proactivists perceived wider stakeholders pressure. Apart from regulatory stakeholders, they also see employees, notably top management, and most secondary stakeholders (competitors, ENGOs and media) as impinging on their environmental management. Second, there are differences between environmental effectiveness amongst environmental strategy proactiveness categories, in that the more proactive the companies, the more likely that they are more environmentally effective. Lastly, proactive companies are likely to gain some competitive advantages as a result of their strategy. Such competitive advantages are identified in the study as: improved community relations, improved staff commitment in environmental issues, positive pressure group relations, improved media coverage, market differentiation, as well as leadership in environmental management in the industry.

Chapter Ten

Discussion, Conclusions and Recommendations

10.1 Introduction

There are three aims of this chapter. First, to answer the research questions, based on either a combination of findings from both the quantitative and qualitative research methods, or from the findings of either method (quantitative or qualitative). Second, to discuss the findings of the research questions in the context of broader corporate environmental management literature. Finally, to give some recommendations on how to increase environmental strategy proactiveness and sustainability in the MPOI, as well as suggesting future research ideas that have become apparent as a result of the research process, the researcher's knowledge and experience.

10.2 Discussion

The mixed methods or triangulation research of the study investigated corporate environmentalism in the Malaysian palm oil industry. The research questions addressed in the study were:

i) what types of environmental strategies have the MPOI adopted?

ii) how and to what extent does the management of each strategy proactiveness group respond to environmental stakeholders' pressure?

iii) & iv) is there any difference in the effectiveness and competitive advantage of various environmental strategies adopted by the MPOI?

v) do size and resources of the companies determine the level of environmental strategies?

vi) what environmental strategy should the MPOI adopt to be more environmentally responsible?

Each will be answered and discussed in turn.

10.2.1 What types of environmental strategies have the MPOI adopted?

The results of the study revealed three levels of overall environmental strategy were adopted by participating palm oil companies. They were labelled by the researcher as

minimalists - four companies; intermediators - two companies; and proactivists - three companies. The minimalists referred to companies that exercised the lowest environmental strategy, the proactivists were those who exercised the highest environmental strategy. The intermediators were in the middle, that is, those companies that seemed to be in the early stage of becoming proactivists, but had yet to achieve such a level. The proactivists were classified as those who exercised a proactive strategy, but intermediators and minimalists exercised a reactive environmental strategy.

The above classifications were based on three levels of environmental measures - operational, tactical and strategic - that were exercised by the nine palm oil companies participating in the study. These levels represent the lower, or functional, environmental measures at the operational level, through to the higher, or corporate, environmental measures at the strategic level. The research findings revealed that all categories exercised most of the operational environmental measures identified in the study. No clear gap was observed between these company groups. Among highly practised environmental measures at operational level were: recycling waste materials such as EFB, oil palm leaves and fibres; reducing the usage of electricity and fuel; reducing chemical usage, increasing production/management of processes of OER; investing in technology (cleaner POME and air emissions); controlling open burning in plantations; reducing soil erosion; and conducting an EIA report. The focus by palm oil companies in the study on the practices mentioned above was driven either by regulatory obligations or economic motives. This is supported by the fact that unregulated practices such as recycling water, use of eco-friendly materials, creating a market for waste and by-products, and reducing the impact of plantation activities on flora and fauna, were hardly exercised. None of these latter activities related to industry regulations, nor did they have the potential to significantly increase efficiency and income of the companies.

In contrast, for the tactical and strategic measures, a clear gap was observed between the proactivists and minimalists and intermediators. At the tactical level, the proactivists tend to integrate EMS into their business framework through the establishment of an environmental policy. Not only do they subscribe to ISO 14000 and other international certifications for their mills and estates, but they also play an active role in environmental management at the national level by being amongst the founding and

active members of the RSPO. The main aim of the organisation is to work towards a more sustainable palm oil industry through dialogue and cooperation among various players in the industry value chains. Meanwhile, at the strategic level, the proactivists established a separate unit for environmental and quality to look after their company's environmental practices. The unit was high in the hierarchy and usually independent from other departments to ensure its efficiency. A further distinct characteristic of the proactivists, was a commitment by their top management to take action on the environmental issues. Unsurprisingly, a strong environmental leadership is present in their companies. Meanwhile, the intermediators showed the early stages of proactive behaviours. At the strategic level, despite members of their board of directors showing concern about the environment, these companies failed to integrate environmental management in their long terms strategies, let alone establish a special environmental unit on its own. Their environmental policy and environmental audit were not as comprehensive as proactive companies, but limited to only a few ISO 14000 certified mills. Their top management involvement in environmental management was piecemeal, and there were no dominant environmental leaders. At the tactical level, while the intermediators showed voluntary environmental management behaviour through EMS, it was limited to ISO 14000 certified mills. As with the proactivists, they were also members of RSPO. However, apart from practices mentioned above, it was not clear what other environmental measures they exercised. In contrast, for the minimalists, none of the above tactical and strategic level activities were reported as being practised by these companies.

Overall, despite the environmental measures that are being taken, the proactivists seem to be lacking in a number of other practices. At the operational level, proactivists did not pay much attention to water recycling, use of eco-friendly materials, creating a market for waste products, and reducing the impact of their plantations in terms of deforestation and its consequences on flora and fauna. For example, none of companies in this category avoided deforestation and encroachment into sensitive areas such as peat lands when it came to their oil palm expansion. Only recently in a few plantations, notably in Sabah and Sarawak, have they started to establish riparian zones along the rivers, and become involved in tree replanting and establishing wildlife sanctuaries in their plantations. At a strategic level, proactivists' environmental training programmes were restricted to top and middle management and not all levels of employees. If

training was given to low level employees, it was limited to the safe use of chemicals and other issues pertaining to the OSHA, which is a mandatory. Moreover, the companies did not do much to encourage their distributors, suppliers and contractors to adhere to environmental management practices. All respondents of proactive companies stated that choice of suppliers and contractors was not dependent on environmental requirements; they were selected merely based on competitive prices that they offered and their past records. None of them had lost a contract due to environmental concerns. This gives a clear indication that environmental strategy of even the most proactive companies focused primarily on the internal affairs of their plantations and mills, and did not extend to the management other players in the palm oil industry supply chains.

The findings of this study seem to be in agreement with a previous study by Tilley (1999) in the UK, who found that while the highest strategies practised by companies was a proactive strategy, none of the companies achieved a level of sustainable development where every aspect of the business's activities was mindful of the environment. As with Tilley's study, this study indicated that palm oil companies were employing environmental strategies that were framed in the 'shallow ecology' world view. The palm oil companies perceived deforestation and exploitation of rainforests as legitimate practices for economic gain, as those activities were conducted according to the law even though this was at the expense of the natural environment. Even though a range of other environmentally friendly alternatives identified through research and development, including developing better planting materials which increase oil yield, high oil to bunch ratio, reduced height of oil palms to facilitate harvesting, a better oil quality and adaptability to different environment, as well as utilisation mechanisation to reduce operational costs, all sound promising, the responding companies preferred oil plantation expansion as the means to increase palm oil yields.

10.2.2 How and to what extent does the management of each environmental strategy proactiveness group respond to environmental stakeholders' pressures?

Overall, the results of mixed methods or triangulation research indicated that environmentally proactive companies were heavily influenced by regulatory stakeholders pressure, pressure from employees, notably top management (primary

stakeholder), and pressures from ENGOs, the media and competitors (secondary stakeholders). On the other hand, reactive companies perceived threats only from regulatory stakeholders. This study also showed that companies in all categories of environmental strategy were not influenced by shareholders, financial institutions, insurance companies, low level employees, customers, distributors, suppliers, the industry association, and the Palm Oil Board (primary stakeholders), or local communities (secondary stakeholders). The results showed proactivist companies were more influenced by external factors - regulatory and secondary stakeholders - rather than primary stakeholders. In other words, environmental proactiveness in the MPOI was externally motivated.

Regulatory stakeholders, especially the DOE, exert a significance influence on the companies due to coercive power that they have over the MPOI. The department is vested with power and authority by the law over the MPOI. The enforcement mechanisms that the department uses including directives, compounds, fines, court charges, and the facility to revoke a palm oil mill's licence to operate. Additionally, the department also conducts regular visits and surveillance, and is responsive towards public complaints and media reports about the industry's environmental violations. As a result of a perceivable threat from the regulatory stakeholders, the industry complies with the regulations. For example, in the case of water and air pollution, it is not only compulsory for a palm oil mill to install ponds, incinerators and chimneys to reduce pollutions, but also to maintain those facilities in order to comply with the standards imposed by the authority.

Apart from regulatory stakeholders, top management also exerted influence on proactive companies to be more environmentally responsible. Respondents of proactive companies highlighted the important roles played by by top management personnel in inculcating environmental issues within their organisations. As those who hold the high ranking positions, the management have power to influence their businesses and subordinates in relation to their companies' environmental practices. They exercise their powers through the establishment of rules, systems and procedures pertaining to environmental management in their companies. To show they are serious, top managers usually establish an environmental unit at corporate level, which is led by a senior staff member, who is active and knowledgeable in environmental issues. Moreover, these

proactive companies also have their own environmental committees, where their members represent different organisational levels or functions. Usually each head of department is a member of the committee. It was also found that top management in proactive companies' disseminate environmental awareness to middle and lower management levels during the company's meetings, and continuously stressed the importance of their environmental performance. Nonetheless, in this study it was found proactive companies exercised a top-down approach to environmental management, in which upper level management usually introduced environmental change, rather than the impetus being from lower management levels and ordinary staff.

In addition to regulatory stakeholders and the primary stakeholder, the companies' own upper level management, proactive companies also perceived pressures on the industry from various secondary stakeholder groups – ENGOs, the media and competitors. ENGOs were considered as a threat because their advocacy campaigns would affect the reputation and market of the MPOI. Other stakeholders who have a direct influence on the industry such as customers, governments, the public, distributors, and financial institutions may take action which could be detrimental to the industry if they were influenced by environmental advocacy campaigns. As with ENGOs, the media also exert an influence on the industry through their news reports. Negative environmental reports in the media would expose the environmental costs of the industry's actions to the public, regulatory stakeholders and other stakeholders. This will not only present a negative image for palm oil companies, but could also lead to far reaching consequences such as legal action being taken by the authorities as a result of such reports.

Additionally, proactive companies also perceived a threat from their competitors' environmental strategies. According to respondents, if competitors moved towards environmentally friendly practices, they would feel jeopardized by the move. They expected that their competitors would gain a number of advantages if they were the first being identified as green palm oil companies. These advantages include a green reputation, and better channel chain selection, or attracting better distributors to market their palm oil in developed societies who are more environmentally concerned. Further, as pioneers in the market, such competitors could easily set standards for others and thus erect a barrier to their own companies' entry into the market.

A more detailed analysis of how each type of stakeholders (regulatory, primary and secondary) exerts pressure on palm oil companies in the study will be discussed in turn.

a) Regulatory Stakeholders

The results of this study overwhelmingly revealed that regulatory stakeholders, notably the DOE, exerted the greatest pressure on palm oil companies. All participating companies (proactivists, intermediators and minimalists) claimed the DOE exercised the highest level of pressure on them to act responsibly towards the environment. The results of this study, which shows that the management of palm oil companies that are in different categories of environmental strategies perceived no different pressure of regulatory stakeholders, matches finding of the studies of various industries by Buysse and Verbeke (2003) in Belgium which found no significant difference of various strategies in respect of threats of regulatory stakeholders. As with Buysse and Verbeke's study (2003), in this study, all strategy levels perceived a high threat from regulatory stakeholders. In other words, although the proactivists over-complied with regulations, they still perceived threats from the authority in much the same way as perceived by their minimalists and intermediators counterparts.

Results of this study are in contrast with the study by Henriques and Sadorsky (1999) in Canada, which found a significant difference of regulatory stakeholders' pressure between companies in the various environmental strategy categories. In their studies, they found proactive companies, who over-complied perceived less threat from regulatory stakeholders, but the opposite was true for the reactive companies, who perceived more threats from environmental regulators. However, that is not the case for palm oil companies in Malaysia. Arguably, a reason why proactive palm oil companies perceived regulatory stakeholders, notably the DOE, as a threat is because although they utilise a wide range of proactive measures, often not all of their mills and plantations fully comply with the regulatory standards. In other words their strategies are not perfect; and their management admitted that in a few occasions: (i) due to carelessness of their employees in maintaining their POME ponds and/ or incinerators they could not comply with environmental standards, and (ii) under certain conditions beyond their control, such as heavy rain and flooding, their ponds released high concentrations of

BOD of effluents into nearby rivers. In these situations they violated environmental regulations and were fined by the DOE.

In this study, all environmental strategy categories (proactivist, intermediator and minimalist) overwhelmingly perceived a high pressure from regulatory stakeholders, especially the DOE. These research results support the results of the majority of studies in the literature in both developed countries (Banerjee, Iyer, & Kashyap, 2003; Fineman & Clarke, 1996; Gonzalez, 2005; Harvey & Schaefer, 2001; Henriques & Sadorsky, 1996; Lefebvre, Lefebvre, & Talbot, 2003; Madsen & Ulhoi, 2001a) and developing countries (Pratt & Fintel, 2002; Rao, 2000; Steger, Lu, & Fang, 2003).

Among these researchers, Fineman and Clark (1996 p.248) for example, argued strongly that the institutionalised power of a stakeholder is the factor that determines which are the most powerful stakeholders. They write, 'throughout our research it became apparent that managers tended to consider stakeholders with institutionalised power as most immediately influential'. As Fineman and Clark (1996) found, the answer to the question of why management of palm oil companies perceived regulatory stakeholders, notably the DOE, as powerful or important stakeholders, can be explained in terms of the power that the authority has over palm oil companies. The main reasons why regulatory stakeholders were perceived as the highest threat for companies in the study is due to coercive power that they have over the industry. For instance, in Malaysia there is a specific regulation for palm oil mills, the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977, which is enforced by the DOE, and those who found guilty of breaches can be fined up to RM100,000 (US$38,000) with 5 year jail sentences for culpable directors and officers. In the case of open burning, more severe penalties can be imposed; under the Environmental Quality (Clean Air) Regulations, 1978, those who are found guilty of open burning can be fined up to half a million Ringgit (US$ 131,580) with 5 year jail sentences for culpable directors and officers. In this case, regulatory stakeholders are perceived as powerful since they have legislative power, and failure to comply with the regulations will result in punishment that affects a company's financial and social bottom line. In addition, in the case of palm oil companies, the DOE cannot only warn, compound, fine and prosecute a mill that violates environmental regulations, but it can also revoke or remove a palm oil mill's licence to operate.

This perception of power is indeed validated by the interviews with a number of DOE officers. According to them, due to the promulgation of the environmental law specific to the palm oil industry - Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977 - as the principal legislative instrument for comprehensive and systematic environmental control of the MPOI, followed by the Environmental (Clean Air) Regulations, 1978, for control of air emissions EQA 1974, palm oil companies in Malaysia have installed pollution controls mechanisms for POME mill effluents and air emission. In addition, in oil palm plantations, companies are also subject to the Occupation, Safety and Heath Act (OSHA) 1994 and the Poison Act, 1952 which respectively relate to safety, health and welfare of employees at work, and the proper storage, handling and safety standards of poisons in plantations.

According to respondents from both palm oil companies and the DOE, apart from the establishment of the environmental regulations, in order to ensure palm oil mills comply with the requirements it is also a legal requirement that palm oil companies submit a monthly record of their mill effluents and air emissions to the DOE. To enforce the law, officers of the department make regular visits to palm oil mills and estates, coupled with surveillance from both land and air. Moreover, officers of the department are also vigilant and sensitive towards the public, the media and ENGOs in regards to complaints and reports. So palm oil companies have felt they were being closely watched by the regulators, with whom they have a long history, and they feel vulnerable if they fail to comply with regulatory requirements. During the worst time, environmentally speaking, in the 1970s, the government gave a wide margin of flexibility and was quite lenient to the industry. At one stage (in the early years after the introduction of the environmental law) they were allowed to pollute the environment, but when pollution treatment methods became available they were required to install the appropriate facilities. Since the regulations pertaining to pollution within the industry has been in existence for five decades, millers actually do not have any excuse whatsoever not to comply. Hence, avoidance of prosecution, fines and losing their licences to operate are of paramount importance.

But nevertheless, the authority of DOE over the industry has been weakened for several reasons. First, lack of staff has prevented enforcement officers from making frequent enough visits to palm oil mills and estates. The difficulties are compounded by the poor

accessibility of palm oil mills - usually situated in remote areas. Second, the DOE was previously considered somewhat lenient and gave considerable freedom to palm oil companies. During the interviews, many of the palm oil companies' managers admitted that in the past their mills had been fined several thousand Ringgit for violations of the law. And for those who had been taken to court for a more serious case, usually a judge would not impose a severe punishment, and since the amount of the fine was relatively small they could usually afford to pay. For example, according to the mill managers whose companies have been convicted, they were fined around RM 20,000 which is only a small fraction of revenues they make from their operations. When the researcher asked a lawyer (who owns his own private law firm) why judges in Malaysia did not impose a maximum financial penalty on the management of palm oil mill that are flouting environmental regulation, he said that the amount was considered as appropriate for such offences. In Malaysia, usually those who violate environmental laws are not considered as criminals in the same light as those who commit other offences such as corruption, bribery, or murder, for example. Third, although there is a provision in the legislation administered by the DOE to jail a director of a company responsible for a violation of the environmental law, this never happens in Malaysia. As a result, management of mills are not sufficiently afraid of not complying with the law. For example, according to a senior researcher of MPOB, during a peak fruit season, usually the management of a mill recognises if his mill processes more than its capacity, its POME effluents will exceed the BOD standard; but because he knows that his company will earn more money than the amount of any fines administered if they are caught by the authority, more often than not he will continue the operation. Up until now, on average 85 percent of palm oil companies' mills have complied with the POME standard, although in the late 1990s the DOE made full compliance (100 percent) the target. However this has never materialised, and indeed, most of the companies in the study admitted that one or two of their mills had been fined in the past five years. When the question was raised as to why full compliance of palm oil mills has never been achieved in Malaysia, management of the palm oil companies that took part in the study used 'the others' excuse; they tended to blame small independent palm oil mills as the main culprits or 'black sheep'.

However for the proactive companies, compliance with the environmental regulator alone will not motivate them to achieve the highest level of environmental

responsibility. Primary stakeholders also influence them to do so, and how they exert their influences is examined in the following section.

b) Primary Stakeholders

The term primary stakeholders refer to those who are critical to the company's existence and activities. Shareholders, financial institutions, insurance companies, employees, customers, suppliers, distributors, the MPOA, and the MPOB were included in this category. Overall, when the researcher combined the impact of all primary stakeholders on each of the environmental strategy groups, the result of the quantitative analysis showed that proactive companies (proactivists) perceived more threats from primary stakeholders compared to the reactive companies. This finding supports the results of studies by Henriques and Sadorsky (1999) in Canada and Buysse and Verbeke (2003) in Belgium, who found that more proactive companies perceived more importance of primary stakeholders compared to reactive companies.

However, when the researcher refined the analysis, and looked more closely at the results (based on both the quantitative and the qualitative data), only the top management of proactive companies were found to be a powerful primary stakeholder group. Since these personnel had the greatest influence in determining the success or failure of an environmental initiative, their attitudes and their commitment towards environmental issues plays a critical role in pushing their companies towards proactive environmentalism. It was discovered that the proactive companies were more likely to have strong environmental leaders, who were not only responsible for the establishment of environmental programmes such as EMS, but also for establishing a special environmental unit to infuse environmental values into their companies and employees.

Again, why upper management personnel are important pertaining to corporate environmentalism in their companies can be explained in terms of their power within the companies. Top management are the ones who are responsible for, and entrusted with, their company's performance. In order to ensure they could lead their organisations they are vested with power. As a result they are powerful in relation to subordinates who, at the same time realise their top management are the source of their company's success. Top management people are those who generally discern the strong

signals of growing green consumerism in developed countries, as well as monitoring pressure from ENGOs on their businesses, and use their positions to exert influences on their companies to be more environmentally concerned.

In this study, the proactive companies were characterised by leaders who were not only concerned about the environmental performance of their organisations but at the same time were committed towards environmental management. This is evident when they used companies' resources - money and human resources - to establish a special environmental unit, in order to ensure their companies were constructive about environmental management. Moreover, they also hold a high level environmental position within the company, which means they were personally involved in decision making. More importantly, environmental practices are usually more successful when someone at the top leads the cause. Subordinates tend to follow orders from someone who holds a high level position as they are more influential. As for employees, the actions of their top management were considered as legitimate. They acknowledged that such environmentally friendly strategies are not only good for their company, but they also realised such strategies are socially, environmentally and legally acceptable. As a result, all levels of employees would work towards that end. Here it is clear that top management uses its power and the legitimacy of their environmental agenda to create authority or the legitimate use of power towards a better environmental management.

Studies have shown the involvement of top management plays a significant role in determining an organisation's proactiveness of environmental strategies. The higher the commitment of top management, the more proactive the environmental strategies of the organisation will be. Hence, those who are able to get access to and the attention of top management will be more successful in influencing a firm's strategy to behave in an environmentally responsible manner (Agle, Mitchell, & Sonnenfeld, 1999).

c) Secondary Stakeholders

Secondary stakeholders are those people and groups in society who are affected, directly or indirectly by the company's primary activities, but who are not critical to a company's existence. In this study, local communities, the media, competitors, and ENGOs were included in this category. The results of the quantitative analysis showed

there was a significant difference between the proactive companies and the reactive ones in their perceptions of secondary stakeholders' pressure. Proactive companies perceived more threat from secondary stakeholders, while reactive strategy companies perceived no threat from secondary stakeholders. This finding is in line with both the studies of Henriques and Sadorsky (1999) in Canada, and Buysse and Verbeke (2003) in Belgium, who found a significant difference of perception of secondary stakeholder pressure by management of companies with different types of environmental proactiveness. Another view is that reactive companies are likely to consider secondary stakeholders as a nuisance or to simply ignore them (Hunt and Auster, 1990).

A close examination of the quantitative and qualitative data showed that (with the exception of local community) all other secondary stakeholders - ENGOs, the media, and competitors - were perceived by the management of proactive companies as putting high pressure on them to act in an environmentally friendly manner.

In the case of ENGOs, although they do not have any direct power against the MPOI, they use their advocacy campaigns against them, highlighting that the industry has threatened Malaysian tropical rainforests and in turn is endangering the wildlife, especially Orang Utans, as their habitats are being destroyed to give way to oil palm plantations. The ENGOs strategy is to influence other stakeholders, who have direct power against palm oil companies, such as governments in their home countries, the governments of importing countries, customers, distributors, financial institutions and the public. Such an approach is what described by Frooman (1999) as an 'indirect strategy'. According to him power possessed by stakeholders not only depends on the resources that they control, but also their ability to use them. In this case, the MPOI has a low independent resource relationship with ENGOs, and ENGOs have a low independent resource relationship with the MPOI. ENGOs that are independent from the MPOI use other stakeholders who have direct power (economic or political power) to exert pressure on the organisations. For example, Friend of the Earth (FoE), UK, started questioning the corporate social responsibility (CSR) of supermarkets that sold palm oil or products that use palm oil in their ingredients. At the same time the organisation also urged financiers to screen investments in palm oil plantations for adverse social and environmental impacts. In addition, some efforts have been made by ENGOs in developed societies to lobby their politicians to use diplomatic means to push

the Malaysian government to take serious action to address the environmental problems associated with the industry.

When a comparison is made between international ENGOs with local ENGOs, the participants believed the former exerted more pressure because they have greater access to their governments, customers, international financial institutions, and distributors of palm oil in their countries. For example, as a result of ENGOs campaigns a number of distributors of palm oil in Europe only buy palm oil from companies that comply with their environmental and social standards. Moreover, with the advancement of information technology (IT) it is a lot easier for international ENGOs to transmit their campaigns against the palm oil industry to wider stakeholders across the globe. Many ENGOs - Greenpeace, Friends of the Earth (FoE) and WWF - have national bases in Malaysia and a number of other countries across the world.

Although, relatively, local ENGOs were perceived by members of the palm oil industry as less threatening than international ENGOs, they were also recognised as having started to put pressure on the industry. The study showed there are two groups of ENGOs which exert different levels of pressure on the MPOI. First, those who use a 'soft approach' and believe cooperation with palm oil companies is the best way to address the problem. They try to engage palm oil companies in their projects. Second, those who opt for a 'hard approach', preferring to use confrontation, and blockades, or to take legal action to address environmental issues exacerbated by the industry. Usually they work together with local communities who are affected by the industry.

Overall, palm oil respondents believed ENGOs' threats could not be addressed by any individual companies, but they needed to do it collectively. Partly, as a result of ENGOs' campaigns, highlighting that the industry's responsibility for the destruction of rainforests and the loss of biodiversity through land clearance, palm oil companies with the cooperation with the government of Malaysia established the Malaysian Palm Oil Promotion Council (MPOPC) in the early 1990s to counter negative campaigns by ENGOs. This organisation is fully funded by the industry members, led by the large palm oil companies. Through this organisation, palm oil companies and the government embarked on a campaign to inform their stakeholders that they cared for the forest and wildlife. The strategy of the organisation was to carry out a worldwide campaign to

deny the ENGOs allegations and depict their exaggeration of the issues of deforestation and Orang Utan habitats as not sincere, but merely a marketing strategy for soybeans - the main competitor of palm oil producers. Through its publications, media reports and seminars, the MPOPC has argued that Malaysia still has 64 percent forest cover, and the growth of the palm oil industry in Malaysia is not all from deforestation, instead it is to a larger extent from replanting of rubber plantations and other land. In the case of the Orang Utans, the organisation claims that the government has already allocated enough habitat reserve areas for them. The semi-official statements given above were typical answers echoed by the study's respondents to counter negative claims by ENGOs.

However, when they found that the aggressive campaigns by ENGOs started to have their impacts, the industry's players realised it is not enough to counter ENGOs claims alone, and they started responding to and accommodating their demands. Such a move reminds the researcher of businesses' attitudes generally during the 1970s and 1980s in developed countries, which responded negatively to environmental pressures from stakeholders, but in the 1990s they began to shift away from adversarial responses to a position of a greater collaboration and cooperation with environmental stakeholders. There were some positive signs towards this end found in this study. In the interviews, it was established that increasing numbers of proactive companies, especially for new plantations, had started establishing a riparian zone along the rivers in their plantations and at the same time planting forest trees on the hilly terrain. Moreover, on a number of occasions, respondents of proactive companies claimed they would be creating wildlife sanctuaries so that native fauna can co-exist with their plantations. Furthermore, a number of companies in Sabah have engaged with WWF and are voluntarily allocating some of their lands to build forest corridors for animals.

As is the case with the ENGOs, the media, as a secondary stakeholder, also uses the 'indirect strategy' to exert pressure on the palm oil industry. The proactive companies appeared to be concerned about being caught doing something wrong by a news reporter as well as being caught by a regulator. Arguably, due to their companies' reputations they feel that they are vulnerable to negative reports. Although in Malaysia, newspapers are quite careful in their initial reports and usually avoid reporting the name of a mill or plantation involved in a violation, when they mention the location of a case, this might give some clues to the public and the authorities as to which companies are

responsible. However, once the DOE or local authorities are involved, the media may provide a name of the company responsible. Despite media control, it is not uncommon for the media to release the name of companies responsible when they have clear evidence to support the story. In a number of statements, respondents of proactive companies claimed that the DOE as well as politicians were very sensitive to media reports and would take action as a result of those reports.

Fearing being threatened by the media, the proactive companies have resorted to a two-pronged approach. First, they have begun to improve their environmental strategies, especially by becoming involved in voluntary activities like EMS, as well as other environmentally friendly practices such as IPM and the reduction of soil erosion, in order to provide themselves with positive publicity. Moreover, through their public relation officers, many of whom used to work for newspaper companies, they have created a connection with the media to publicise their environmental efforts. They also try to engage the media by sponsoring media programs or the special events in an attempt to avoid bad press.

Another significant secondary stakeholder group, competitors, unlike DOE and the media, exert a rather direct pressure on palm oil companies to be more environmentally responsible. The fact that their competitors have moved towards environmentalism in their practices is considered as a challenge that MPOI companies cannot ignore. The environmentally proactive competitors, according to the respondents, could be expected to gain a number of advantages including: (i) a green reputation - when a company moves first into environmentally friendly palm oil products it may establish a reputation as a pioneer, a reputation that emulators will have difficulty in overcoming. It also may be the first to supply particular buyers and thus to establish relationships from which loyalty develops; (ii) channel selection - a first mover may gain a unique supply channel access for environmentally friendly products. At present there are a number of food chain distributors in Europe, such as Migros from Switzerland and Karlshamms AB from Sweden, who only buy palm oil from selected companies based on this criterion; and (iii) definition of standards - a palm oil company that is a forerunner in environmental strategies can define the standards for environmentally friendly palm oil products to its own advantage and force late movers to adopt them. These standards in

turn create a barrier for other companies, while at the same time making the forerunner's own position more sustainable, as it difficult for others to imitate.

If competitors gain the aforementioned environmentally friendly status and other advantages associated with it, they would have a competitive edge, making it difficult for others to compete on environmental grounds. This is especially true for markets in developed societies, where a significant proportion of consumers are not only environmentally conscious but also willing to pay a premium price, and at the same time avoid buying products from companies who have bad environmental track records. Though at present only a small percentage of consumers in developing countries are willing to support environmentally friendly companies through their buying behaviours, this then is expected to increase in the near future when they become more developed and more prosperous. An important message here for the MPOI is that is better to pre-empt competitors' strategies by being environmentally friendly companies. As for proactive companies, these arguments might explain why they needed jump onto the green bandwagon and improve their corporate environmentalism.

10.2.3 Is there any difference in the effectiveness of the various environmental strategies adopted by the MPOI?

The results of this study show that companies that adopted proactive environmental strategies (proactivists) were more effective than those who adopted reactive strategies. Overall, the results of this study supports studies elsewhere in finding that there is a significant difference between different environmental strategies and company effectiveness (Melnyk, Sroufe, & Calantone, 2003; Thornton, Kagan, & Gunnigham, 2003). Among the environmental effectiveness outcomes gained by the proactive companies were: environmental disclosure, high technological investment, and environmental awards.

In terms of environmental disclosure, almost all proactive companies in the study published their environmental activities, such as zero burning practices, ISO 14000 and ISO 9000 certifications, and environmental policies, in their annual reports. At the same time, a few published a special report about their sustainable practices. These companies claimed such a disclosure served as a platform to create awareness about the importance

of sustainable development among their employees and other stakeholders. Meanwhile, in terms of high investment in technology, the proactive companies spent some amount of money to improve their POME treatment. One of the companies conducted research to determine the optimum temperature and other requirements to activate bacteria in their ponds to increase their effluent treatment efficiency. Another company used an anaerobic digester instead of an ordinary lagoon system for POME treatment. This positive approach was also employed for reducing air emissions, which was achieved by utilising a new boiler equipped with a computer system to record the amount of emission releases from the chimneys. The proactive companies have also gained more environmental awards as recognition of their positive environmental practices; for example, awards for environmental reporting in their annual reports, international certifications such ISO 14000 and ISO 9000, and Good Agricultural Practice certification conferred by the EU. Additionally, one company in this category also received a prestigious award from the UN for its contribution to zero burning techniques, and the company was among the pioneers of such practices.

Overall, the results of this study showed that the more proactive the companies were the more effective they would be. This was observed chiefly in the areas of environmental disclosure, higher technological investment, as well as environmental awards achieved by those companies.

10.2.4 Is there any difference in the level of competitive advantage of the various environmental strategies adopted by the MPOI?

The results of this study showed that the management of proactive companies perceived a number of competitive advantages emerging from their environmental strategies: improved community relations, improved staff commitment to environmental issues, positive pressure group relations, and improved media coverage, leadership in environmental management, compliance with regulation, good company reputation, and market differentiation. On the contrary, the reactive companies were only able to associate their environmental strategy with two competitive advantages: compliance with regulations and good reputation. Though, both the proactive and reactive companies claimed they gained advantages as a result of their strategies, none claimed they gained advantages in terms of reduced insurance premiums or cheaper finance.

Comparing the results, the proactive companies appear to have more competitive advantages resulting from their environmental strategies than the reactive companies, notably in terms of improved community relations, staff environmental issues' commitment, positive pressure group relations, media coverage, leadership in environmental management and market differentiation. These findings are consistent with conclusions in the literature on environmental strategies that proactive companies gain more competitive advantages (Delmas, 2001; Leal, Fa, & Pasola, 2003; Sharma & Vredenburg, 1998; Shrivastava, 1995a; Slater & Angel, 2000; Tien *et al*, 2005).

Apart from more competitive advantages perceived by the proactive companies, the results of the study also showed that the reactive companies only saw external advantages of their strategy, such as compliance with legislation and a good name. On the contrary, the proactive companies not only believed in external benefits (compliance with legislation, good name, improved community relations, positive pressure group relations, improved media coverage and market differentiation) but simultaneously believed in the internal benefits from their environmental strategies, such as staff being more committed to environmental issues, and that they were also leaders in environmental management in the palm oil industry.

10.2.5 Do size and resources of the companies determine the level of environmental strategies?

In terms of the impact of a company's size, and its resources, on the level of environmental strategies, the results from quantitative analysis will be used to answer these questions. In this study two proxies of size – plantation area, and number of employees engaged in the palm oil sector of each palm oil company- were used to represent a company's size. The effects of plantation area and number of employees were then tested against the relationship between stakeholders' pressure and environmental strategy of the nine palm oil companies participating in the study. The results of the analysis showed both proxies of size affect the relationship between stakeholders' pressure and environmental strategies. These results indicate that a company's size is a moderator that affects the relationship between environmental stakeholders' pressure and environmental strategy. This finding matches the study by Buysse and Verbeke's (2003) in various industries in Belgium, and Henriques and

Sadorsky's study (1999) on 750 large companies in Canada, which established that the size of a company moderates the relationship between stakeholders' pressure and a company's environmental strategy.

The results of this study also showed a significant positive relationship between size (i.e. plantation area and number of employees) and both stakeholders' pressure and environmental strategy. This tends to imply that the larger the size of palm oil companies, the more likely that they will get pressure from stakeholders, and the more likely that they exercise a proactive strategy, and vice versa. This finding of a strong correlation between size and environmental proactiveness supports studies elsewhere by Elsayed (2006), Rothenberg and Zyglidopoulous (2007) and Sharma (2000). Hence is clear that the area of palm oil plantations related to stakeholders pressure. The respondents of the big companies admitted that due to their plantation area they are more vulnerable, as they are more visible to the public. This makes them more sensitive to public opinion, in turn makes them more likely to invest in environmental innovation to avoid negative publicity. For example, the expansion of the oil palm plantations is always associated with deforestation and depletion of flora and fauna. The big plantation companies who are involved in massive deforestation will be easily vulnerable to such kind of an accusation. Hence, to anticipate and manage stakeholders' pressure, especially from ENGOs and the public, big companies exercise a proactive strategy. At the same time, they believe by doing so they could project their images to gain a better corporate reputation.

The average from responses of the four managers of each palm oil company in the study was used to represent a company's resources - financial resources, physical equipment, human resources, management systems, technology, and reputation. The results of quantitative analysis showed that resources did not affect the relationship between stakeholder's pressure and environmental strategy. This finding seems to support previous studies undertaken elsewhere by Elsayed (2006), Henriques and Sadorsky (1996) and Toms (2002). Nonetheless, these findings need to be treated with caution. Arguably, as explained in the previous chapter, the researcher suspects that respondents were more likely to exaggerate their companies' resources in the survey. This is evident as, whatever the size of their company, respondents rated all resources variables at the high end of the scale. As a result, large companies and medium size companies in the

study showed no difference.To validate this argument, the researcher compared the resources of one company, a medium size and newly listed company under the KLSE, with a number of multinational companies. Surprisingly it was rated as having higher resources than the multinational companies in the study. Perhaps, a more accurate alternative for measuring resources would be based on financial ratios from annual reports, rather than the multi-scale items measure as used in the study. Nevertheless, financial ratio statistics only provide information on financial resources of a company. Financial resources alone are not enough to explain other resources, such as physical resources, human resources, control systems, technological resources, and company reputation. All of this information is not usually available in a company annual report.

10.2.6 What environmental strategies should the MPOI adopt to be more environmentally responsible?

In this research it was found the highest level of environmental strategy adopted by MPOI was a proactive strategy, which was labelled by the researcher as Proactivist. The proactivists exemplified a strategic response and demonstrated some sort of a managed, or systematic, effort of environmental practices as well as a continuous ongoing goal of environmental improvement from operational to tactical and strategic level measures. It shows that what these companies did was simply to comply with the requirement of the law, as well as to increase the efficiency of their businesses. As a result they were still under-achieving in a number of practices at operational, tactical and strategic levels. At an operational level palm oil companies lacked in carrying our water recycling, and few of the companies create markets for by-products. In addition, it was also found that the industry did little to avoid deforestation and its far reaching consequences on flora and fauna. This is the main area of criticism among stakeholders, especially ENGOs, and in order to achieve the requirements of the SD, the MPOI should make considerable efforts to avoid deforestation in its standard practices. Meanwhile, at tactical level it was found companies were lacking in the areas of green supply chain management and product life cycle evaluation. At a strategic level few companies had a specific environmental officer and/or environmental engineer to oversee their company's environmental performance. Moreover, environmental training was generally limited to top and middle management level personnel.

In order to address the problem, the MPOI should aim for the highest environmental strategy possible. In the literature of environmental typology there are a number labels for such a strategy: *Enlightened Environmental Management* (Petulla, 1987); *Leading Edge* (Roome, 1992); *Transcendent* (Welford, 1995); *Environmental strategy* (Hall & Roome, 1996); *Summit* (Byrne and Kavanagh, 1996); *Sustainable Development* (Hart, 1997); *Sustainable or ecological strategy* (Tilley, 1999); *Proactive* (Henriques & Sadorsky, 1999); and *Environmental leadership* (Buysse and Verbeke, 2003).

Overall, the highest typology of environmental strategy is characterised by: establishment of strong corporate support for a proactive environmental management policy that goes beyond compliance to long-range environmental planning; a strong environmental management division under a major corporate officer; training and awareness programmes that are extended across all levels of employees; use of state-of-the-art technology and pollution control equipment; sophisticated environmental monitoring, surveillance, and record-keeping systems; periodic environmental audits with reports to corporate headquarters; cooperation between environmental and production staff; on-going research to determine cost-effective methods of maintaining high environmental quality and resource recovery; good relations with agency officials and community groups; consideration of environmental challenges as positive opportunities; and a view of stakeholders as partners to create business-based solutions.

By adopting these dimensions of environmental strategy the MPOI would not only be responsive to legal and economic demands, but would also be responsive to social and stakeholder demands. In other words, there would be the pursuit of environmental excellence as a real business strategy of the MPOI. This involves a fundamental rethink of all aspects of the industry, which requires holistic integration of the environment into the structure and management of the business

In order to achieve this the MPOI should adhere to the following practices:
(i) *Operational level* - recycling waste materials and water; reducing usage of fuel and electricity; investing in efficient and clear production/management processes to increase OER; investment in cleaner POME and lowered air emissions; Environmental Impact Assessment; use of eco-friendly materials; creation of markets for waste; reduced deforestation; and overall reduction of adverse impacts on flora and fauna.

(ii) *Tactical level* - setting environmental criteria for suppliers/contractors; encouraging distributors environmental practices; adopting EMS (e.g. ISO 14000 or other certifications); evaluation of the life cycle of palm oil products; becoming active members of RSPO and honestly adhering to its principles; and publishing environmental policies for stakeholders.

(iii) *Strategic level* - increased concern by board of directors about the environment; integration of environmental issues into long-term business strategy; written environmental mission statement; an established environmental division and an environmental committee; established environmental objectives; proactive environmental involvement of upper level management; strong environmental leadership, employment of environmental officers/engineers, periodic environmental audit; and environmental training for all levels of employees.

10.3 Conclusions

There are a number of conclusions that can be drawn from this study.

First, there were three environmental strategies adopted by the palm oil companies studied, and they were categorised as *minimalist*, *intermediator* and *proactivist*. Both the minimalist and intermediator companies exercised a reactive strategy, while the proactivist companies exercised a proactive strategy. Of the three levels of environmental activities, the proactive companies showed a higher practice of tactical and strategic level activities, no differences were observed between the three strategy categories at the operational level. Among activities that the proactive companies exercised at the tactical level were: undertaking EMS (such as ISO 14000), playing an active role in environmental management in the industry through membership of RSPO, and publication of environmental management report to stakeholders. At the strategic level, proactive companies integrated environmental issues into long-term planning, had an environmental policy, top management actively involved in environmental management, and periodically conducted environmental performance audits.

Second, in terms of stakeholder's pressure, the study established that the proactive companies perceived pressure from a variety of stakeholders. Apart from the environmental regulators, they also perceived pressure from employees, notably top managers (primary stakeholder), as well as from ENGOs, the media and competitors (secondary stakeholders). In other words, legislative pressure alone on these companies does not result in a higher implementation of environmental strategies. However, the reactive companies, especially the minimalists, only perceived regulatory stakeholders as applying major pressure. It was observed that the DOE, for instance, used its coercive power to exert pressure on the industry. As for the top managers of proactive companies, they used their positions, as well as their participation, to exert pressure on their companies to be more environmentally conscious. Nevertheless, in the case of ENGOs and the media, the management of proactive companies perceived their pressure through campaigns and reports that could influence other stakeholders to take action against their companies. Competitors' environmental strategies were also perceived as a threat because they could enjoy the competitive edge of being the first to be recognised as environmentally proactive companies.

Third, this study showed that the proactive palm oil companies gained more environmental effectiveness and competitive advantage than the reactive companies. In terms of environmental effectiveness, the proactive companies were more effective as they demonstrated that they practised environmental disclosure, made high investment in environmental technology, and they also received more environmental awards. In relation to competitive advantage, the proactive companies appeared to have improved community relations, improved staff commitment to environmental issues, positive pressure group relations, and improved media coverage. They were also leaders in environmental management, and benefited from a market differentiation.

Fourth, the study demonstrated that the size of palm oil companies moderated the relationship between stakeholder's pressure and environmental strategies. This implies that the greater the size of companies the more likely that they will exercise proactive strategies. But, this relationship was not observed for company's resources. Arguably, this is due to exaggeration of the companies' resources by respondents in the study.

Fifth, this mixed methods research methodology provides a significant improvement over methods used in studies in the existing literature, where most used one single method for analysis. The weakness of the quantitative method, especially in terms of the multi-item scales in the survey, is that the respondents were inclined to skew their answers positively; this is especially true for items related to the company's resources and competitive advantage. To avoid such bias, an in-depth interview was conducted as a refinement of the research data. The in-depth interview enabled the researcher to probe for more details of any particular questions.

Sixth, the researcher also believes this research contributes to corporate environmental management literature, especially in the study of corporate environmentalism in developing countries. Over the past three decades, there have been an increasing number of studies of corporate environmental strategies in developed countries. But nevertheless, such studies are limited in developing countries, despite the fact that these countries contribute disproportionately to environmental degradation. This is where this research will contribute to knowledge.

Finally, these results have important implications for managers of companies in the Malaysian Palm Oil Industry, for authorities that enact public policy and for other industry stakeholders, on how to increase the palm oil industry corporate environmentalism and sustainability.

10.4 Recommendations

The research findings of the study have important implications for public policy makers, management of the MPOI, and other stakeholders such as distributors, customers, and ENGOs among others, on how to encourage a more environmentally sustainable palm oil industry in Malaysia.

10.4.1 Palm Oil Companies

Before making any plausible suggestions to the MPOI, it is worthwhile to look at the barriers to environmental improvements in the industry. From the interviews with both palm oil industry members and their stakeholders, there appear to be six main barriers faced by MPOI: financial constraints; negative attitudes towards environmental

improvement investment; lack of support and commitment from upper management; low environmental awareness among employees; lack of expertise in environmental management; and low environmental education and training among employees.

Analysis of these problems suggests a number of possible ways to address them.

i) Cultural Change Programme

If the present culture of palm oil companies is to shift and become environmentally proactive, then attention needs to be paid to the values upheld within their organisations. Welford (1995 p.119-141) suggests that the vehicle towards a sustainable model of business enterprise is a 'cultural change programme' which re-evaluates global, organisational and individual values. For the global values, the MPOI should consider a wider definition of sustainable development (SD) that incorporates the environment, equity and the future. Achieving SD requires the MPOI to follow Agenda 21 principles, as described previously in Chapter 2 of the thesis. Among points deemed relevant in this case, the MPOI must: (i) develop policies that result in operations and products that have lower environmental impacts; (ii) ensure responsible and ethical management of products and processes from the point of view of health, safety and the environment; (iii) encourage overseas affiliates to modify procedures in order to reflect local ecological conditions and share information with the governments; and (iv) increase R&D on environmentally sound technologies and environmental management systems.

For the organisational values, the two closely related values for the MPOI are that: (i) recognised social goals (including environmental goals) and profit are not only compatible, but interdependent; and (ii) smart growth incorporates today's economic and environmental problems into tomorrow's opportunities. For example, the growth rates of palm oil should come from technological advancement in agriculture, such as improved strains of palms to produce greater yield per hectare, rather than increased size of plantations. Additionally, for the individual values, the MPOI should be divided into 'quasi-firms' - small, autonomous teams designed to increase efficiency. Companies need to realise that their business' survival depends on successfully interacting with other living systems on the planet as well as with local communities.

In this vein, Welford (1995) also argues that if businesses do not incorporate environmental values into their corporate value systems, their culture will be imbalanced and incongruent with that of their wider stakeholders. In the future it is expected that environmentalism will become of increasingly important to individuals and society, and companies will find it increasingly difficult to resist, as a result they need to bring their corporate values in line with those of their internal and external stakeholders. In other words a prerequisite for sustainable business is to fulfil three bottom lines - people, planet and profit. Businesses should be sensitive towards wider stakeholders' pressures; complying with the government regulations alone is not enough. A company's manager needs to understand the concerns of its stakeholders in order to develop objectives that stakeholders would support for organisational long-term success. Therefore, the manager should explore the relationships with all stakeholders in developing effective business strategies (Freeman & McVea, 2001 p.190). The number of stakeholders and variety of their interests can be quite large; thus, a company's decisions can become very complex (Henriques & Sadorsky, 1996 p.383; Post, Lawrence, & Weber, 1999 p. 7). However, in practice, it is difficult and costly to identify and meet all the stakeholders' demands. Consequently, it is crucial for the manager to identify and analyse the meaning and significance of each group, and to determine their respective power, in order to be prepared for the conflict that may follow from the prioritising of competing groups of stakeholders (Madsen & Ulhoi, 2001b p.79).

The cultural change programme in MPOI will not be completed if they are not armed with practical means. According to Porter and van der Linde (1995b p.114) companies must start to recognise the environment as a competitiveness opportunity and, to begin with, companies must improve their measurement and assessment methods to detect environmental costs and benefits. At present there are various managerial techniques available such as TQEM, ISO 14000, LCA and environmental auditing and accounting. The analysis of the data in this study showed that a majority of palm oil companies in the study were slow to embrace these environmental practices. Even for those adopted by any of the companies, they were not widely applied throughout the industry but only limited to one or two mills or plantations.

A successful cultural change programme requires a strong environmental leadership, and more often than not, senior managements will have to be the leaders. According to Dodge (1997 p.115-116) environmental leaders in an organisation should show a strong concern for both the environment performance and the profit or production of their organisations. At the same time, they need to be 'transformational leaders' who motivate subordinates to perform environmentally friendly activities beyond compliance levels by inspiring employees to focus on broader environmental missions that transcend their own immediate self-interest. Such leaders also need to effectively communicate a sense of environmental mission of their companies (Dodge, 1997 p.118-119). This is indeed paramount; however, the problem is that most of the palm oil companies interviewed in this research, especially the reactive ones, have yet to have strong environmental leaders, who are committed towards their companies' environmental agendas.

ii) Environmental Education and Training

The above cultural change programme could not be successful unless environmental education and training are provided by the MPOI to their employees. In the interviews it was found a coherent and holistic knowledge about environmental issues does not exist for most respondents of the studied companies, chiefly the reactive ones. A lack of knowledge of environmental issues in Malaysia is arguably due to limited environmental education and training in environmental management concerns. Most managers of the surveyed companies came from agricultural, engineering, and business backgrounds where study on the environment and its issues was barely included in their curricula at university. Environmental education for management level personnel can help to instil environmental values in their organisations.

In order to equip them with technical and practical environmental information, the management of the MPOI needs to attend skills-based training specific to environmental management - such as TQEM, ISO 14000 - and the other types of training aimed at broader environmental knowledge. In Malaysia there are a number of environmental educational centres. For example, ENSEARCH, an ENGO which periodically provides short training courses in environmental management areas such as chemical safety and handling; EIA; Environmental Quality Act, 1974 and regulations; scheduled waste

management; Occupation, Safety and Health Act and regulations; product life cycle assessment; ISO 14001 environmental management implementation (Ensearch, 2007).

But specific management training or skill-based training alone does not do enough to produce a deep environmentally conscious management. General environmental management training, such as a critical or theoretical-based orientation of environmental management, is also essential (Price, 2004). For example, in this type of training, participants will be introduced to the dynamics of ecological systems, how human beings interact with the systems, and how the system reacts to human impacts. The kind of knowledge gathered during this training would provide a learning opportunity which would help the management of MPOI to see a broader issues of the environment, and this in turn would raise their commitment to transform their workplaces and assist them in their endeavours to be more environmentally conscious.

iii) Overcoming financial barriers

The changes to business practice described above (cultural change programme and environmental education and training) would address environmental barriers to proactive corporate environmentalism. But nevertheless, in terms of financial problems, it is worth further clarification. While financial barriers to making any changes to business practices were obvious, the explanations given by the palm oil company representatives for not being able to be environmentally proactive, were, in the researcher's opinion, often excuses. But, this is not to say costs were not a problem, since arguably, palm oil companies do have serious financial constraints. This study found that the over-riding opinion of the managers in the MPOI, that interpreted environmental investment as a threat rather than an opportunity, partly explains why such investment is considered a cost burden to business and the economy. This is evident, as both representatives of MPOB and DOE argued that financial constraints were not really much of a problem for palm oil companies in the study. The representative of MPOB argued that during the 'good times' of high prices of palm oil in the world market in the early 1990s, when price of palm oil reached close to RM 3,000 per tonne (at the time of the interview this was RM 2,200), and operational costs were much cheaper, palm oil companies generated large profits, but they procrastinated in making an investment to improve their POME and air emission treatment. The

question is, if environmental matters are not considered important during 'good times', there is no guarantee that companies will consider them so at other times. The root cause of the problem, a negative attitude towards proactive environmental management, needs to be first addressed.

10.4.2 Role of the Government

The barriers to a more environmentally sustainable palm oil industry that were identified in the study in relation to the government and its authorities (especially the DOE), can be divided into three main categories: CAC (command and control) mechanisms to address environmental problems in Malaysia; lack of political will; and legal challenges.

Lack of financial rewards, incentives, and appreciation for proactive companies, together with a lack of flexibility by the DOE to allow palm oil companies to proactively deal with POME and air emissions, relate to the CAC mechanisms that have been used by the government. Meanwhile, the problems that underpin the DOE's performance - such as lack of enforcement, training and knowledge of environmental officers - relate to an insufficient government allocation of funds to the DOE, and reflect the lack of political will by the government to address environmental issues. In addition, legal challenges to environmental sustainability are characterized by lenient punishments and overlapping environmental jurisdictions between the state and federal governments. In order to increase corporate environmentalism and environmental sustainability in the industry, measures should be taken to tackle these three problems involving a combination of CAC and MBI (market based instrument) mechanisms, changes in legislation, environmental education and training, and labelling schemes for green products such as eco-labelling certification.

i) Combination of CAC and MBI

At present, the Malaysian government depends on CAC approaches, whereby the MPOI is expected to adhere to stipulated standards on environmental pollution and waste management. The CAC based legislative solution is not a satisfactory method of responding to environmental problems. Although it does guarantee a minimum

environmental standard or compliance, respondents in the interviews often find the optimal outcome is to seek an end-on-pipe solution. Additionally, CAC approaches incur high costs, and are unable to deal with particular environmental problems, notably zero discharge practices, and reduced effect on flora and fauna. The rigidity and inflexibility of CAC fails to provide polluters with an incentive to go beyond the minimum compliance standards

As for palm oil companies, they need to understand the real and tangible consequences when they do behave in a more environmentally friendly manner. Put differently, palm oil companies that are making strides to reduce their negative impact on the environment should be positively rewarded for their efforts. By using the 'carrot and stick' approach of a combination of CAC and MBI, the government can use the tactics of positive benefits as well as negative penalties. The 'carrot and the stick' may motivate more responsible environmental behaviour by palm oil companies. Examples of MBIs are green taxes, tradable permits, polluter pay principles, deposit-refund schemes, and subsidies. The main purpose of such practices is to provide polluters with a financial incentive to change their behaviours, such that a more acceptable environmental outcome is achieved.

In fact the MBI approach is not unknown for the MPOI since, as was discussed in a previous chapter (Chapter 4), in the late 1970s and early 1980s it was successfully used to address the endemic POME pollution in Malaysia. But once all palm oil mills had established their own POME treatment plants the mechanism were abandoned. MBIs need to be introduced to provide polluters with a greater incentive to improve their pro-environmental behaviour. If the Malaysian government is serious enough, it can learn valuable lessons from developed countries, such as in the US and European countries, which have already applied the MBIs. As a further encouragement to enhance MPOI investment in environmentally beneficial technologies, the government should also grant five-year pioneer status tax cuts.

The application of MBIs does not mean CAC approaches need to be abandoned by the government; instead MBIs should be combined with a strong regulatory CAC approach. A combination of MBIs and CAC approaches should allow the advantages of one to balance the disadvantages of the other. The proponents of CAC for example, Porter and

van der Linde (1995a) and Eckersley (1995; 2004), advocated a return to a strong regulatory solution to the environmental problems exacerbated by businesses. According to Porter and van der Linde (1995a) the environmental-competitive debate has been incorrectly framed. Instead of the focus being environment equals costs, the new debate should be refocussed towards a new concept of resource productivity that will open up new ways of looking at both the full systems cost and the value associated with any product. They claimed the investment in environmental improvements as a result of tougher environmental regulation can lead to a competitive advantage, notably if businesses embrace the concept of pollution prevention which encourages the development of material substitution and closed-loop processes for efficiency. The resource productivity principles supposedly motivate businesses to find innovative solutions that will contribute to profitability. By so doing, the regulatory compliance costs will be compensated by the resource productivity gains.

A second driving force of legislation is to discourage poor environmental business practices. Environmental misdemeanours perpetrated by MPOI can be penalised using legislation, fines, penalties or imprisonment. According to the respondents from the DOE, imprisonment would be the most effective way to make a manager (and his company) pay considerable attention towards environmental issues, as he would learn a valuable lesson from such a punishment. As for other punishments, such as fines and compounds, they are not considered as sufficient deterrents because palm oil companies can afford to pay. In reality, the amount of the financial punishment is only a small fraction of what the palm oil companies earn through their operations.

Nonetheless, it should be noted that such reforms addressing environmental issues would be depicted as anti MPOI and actions that would undermine the Malaysian economy. Indeed, government taxation on the palm oil mills through MBIs in the 1970s and 1980s was heavily criticised by the industry's players. However, over a period of some time the industry has come to terms with it.

ii) Changes in Legislation

One of the main handicaps pertaining to MPOI's environmentalism is that the industry falls under various jurisdictions. Matters pertaining to POME and air emissions are

under the purview of the DOE - the federal agency. These two problems have been fairly successfully dealt with, from the worst polluters in the 1970s and 1980s to a cleaner industry today. The main concern of the industry at present is the deforestation issues and its far-reaching environmental impacts, but there is little that the DOE can do. In Malaysia matters pertaining to lands and forests come within the purview of the state governments, who usually decide which areas should be allocated to palm oil plantations. Although a palm oil company needs to submit an EIA report to the DOE for approval prior to commencement of a new palm oil plantation, since the state has already approved the project in principle before an EIA has been completed, oftentimes the project has started upon an approval from the state government. Palm oil companies have realised that the state governments have more authority and their approval is a licence to begin their project, and disregard the EIA. Since the state governments do not have their own environmental officers, nor legally responsibility to monitor mitigation measures to prevent the adverse environmental impacts, the palm oil companies' activities in the early preparation stages, especially involving land clearing and terracing, are left unchecked.

In order to successfully deal with this problem, the state governments need to have their own environmental officers, who will not only be responsible for environmental issues pertaining to lands but at the same time be responsible for EIA. This would ensure palm oil companies would adhere to EIA mitigation measures to reduce the environmental impacts of their activities. The existence of state environmental officers would complement environmental officers at the federal level.

A further recommendation is for reform of the strata of federal-state environmental legislations and financial arrangements pertaining to palm oil exports. At present in Malaysia, the federal government has exclusive control over the MPOI. The palm oil companies have until recently being among the largest taxpayers. The federal government charges oil palm companies through export tax (known as cess) and as a result money goes to the federal treasury. What the federal government should do is to allocate such tax revenue to the state governments appropriately. This recommendation will be considered in more detail in the ecological modernisation (EM) section in the following discussion (section 10.4.5).

Another concern pertaining to government regulation is its media legislation. A repressive media act and other acts that limit media freedom such as the Printing Presses and Publication Act 1984, the Official Secret Act, 1972 as well as the Internal Security Act (ISA) 1960 should be revised to give more freedom the media, ENGOs and the public. This relaxation of legislation could result in more balanced environmental reports and public involvement in decision-making processes for better environmental conservation in the country. In the past, the ISA was used to detain some ENGO activists under the pretext of national security when they objected an unsustainable practice of government activities, notably logging activities in Sarawak.

iii) Environmental Education and Training.

Environmental education is an essential component in the overall solution to the problems, that needs to be addressed by the government. At present, there are few or no signs that environmental education has been integrated into the school curriculum in Malaysia. But, there are positive signs that environmental education is beginning to exert a greater influence on the development of curricula at the university level. Many universities have established centres for environmental management studies. For example, the Institute for Environment and Development (LESTARI) was established in 1994 as a multidisciplinary institute within the structure of the National University of Malaysia. It fulfils the aspirations of the university, as envisioned by the UNCED held in Rio de Janeiro, Brazil, to realise the goal of SD through R&D. It was also established to serve as a reference centre, capable of dealing with environment and development issues, assisting the government in formulating policies based on research of a holistic and balanced kind. The development function is directed towards enhancing human resource capacity through skill development and training, for both the government and private sectors (Lestari, 2007).

Notwithstanding the establishment of environmental centres, university students who are enrolled in the centres are limited to those in environmental management related disciplines such as geography and physical science. Environmental management has yet to be integrated into other disciplines like business, agriculture, engineering, and accounting. Environmental science is not being taught as its own subject, let alone as part of a wider range of subjects in those courses. The question is, if today's students

are not properly exposed and equipped with environmental knowledge, will tomorrow's managers have environmental concerns when they make business decisions?

Recognising such problems, environmental education should be integrated in both the school curriculum and in above-mentioned disciplines at the university level in order to cultivate a strong environmental awareness amongst this significant sector of the population. By this means it is hoped that the public are made aware of the importance of the environment. Once the public is knowledgeable in environmental issues and business's responsibilities, it is more likely that they will be willing to support green products by being environmentally friendly consumers. Welford (1995 p.7) also realised a need for education among consumers as a strategy that is distinct from governments adopting economic instruments such as taxes, subsidies and labelling schemes for SD. One should remember that today's students will be tomorrow managers, and their environmental knowledge is paramount to ensure they are very concerned about environmental issues and manage to shape the right direction of their company's, or organisation's environmental management.

Apart from the public, DOE officers also need a proper training in their specific areas. Often palm oil companies have taken advantage when DOE officers were not well versed in their jobs. External and internal training as well as short and long term training should be provided to the department staff. Adequate training helps those officers to conduct their jobs professionally and effectively.

iv) Eco-labelling Certification

Another approach to improve corporate environmentalism in the MPOI is through eco-labelling certification of palm oil and its related products. The intention is to use the power of markets as an incentive to induce a more sustainable palm oil industry. To date, Malaysia and many other developing countries have yet to have their own eco-labelling certification. On the contrary, such a certification has been significantly exercised in developed countries. Although a body that is responsible for the certification need not necessary emanate directly from the government, the government should play a proactive role here. Such certification cannot be successful unless backed up by the government, so that the public gains confidence in such a green credential.

As a result of there being no eco-labelling certification in Malaysia, customers do not have full information about products being manufactured. Eco-labelling helps to close this gap of information through which environmentally conscious customers can make the right choice because they can easily differentiate an environmentally friendly product from other products. By promoting eco-labelling the Malaysian government at the same time could encourage transparency as well as accountability of the industry in the country. Indeed, Malaysia could use this mechanism not only to promote its 'premium' palm oil and silence its critics over rainforest exploitation, but at the same time erect a barrier of entry to its competitors in this arena. The EU is expected to support and open up new markets that could favourably utilise the Malaysian competitive advantage in environmentally friendly palm oil. The small domestic market in Malaysia does not provide for economy of scale nor scope for such a product.

10.4.3 Role of the Public, ENGOs and the Media

Notwithstanding the important contribution made by the government and the industry players, they are unlikely to succeed in motivating the required changes within the palm oil companies, unless the public as consumers are willing to support environmentally friendly practices. The interviews revealed that the over-riding opinion of the palm oil companies' respondents is that environmental management is a cost burden to business that cannot be easily passed on to the public. Therefore it came as no surprise that environmental management was inferred as a threat. This is a dilemma faced by the industry. According to respondents, the public want environmentally friendly industries, but at the same time are not willing to pay extra for green products.

A prerequisite for the public becoming environmentally conscious consumers, who are willing to pay for the betterment of the environment, is a paradigm shift. In Malaysia, the public is always being imbued with rhetorical statements by the government that Malaysia is rich with lush rainforests and the most blessed country with endowments of natural resources. Nevertheless, the public do not realise that the tropical rain forest in Peninsular Malaysia is fast depleting, from 74 percent in the early independence years around 1958 to about 40 percent in 1990 (Aiken and Leigh, 1992 p.xvi), and at present it is believed that less than 40 percent is left. These are indeed alarming statistics which are hard to swallow. At the same time, the public needs to be continuously informed

that the last remaining Malaysian tropical rainforests must be conserved for future generations, not only for Malaysians but also for the world as its tropical rainforest is a source of oxygen to stabilise the world's climate in order to arrest global warming.

In the interviews, it was found that none of the media organisations employs any reporters who are specialists in environmental issues. As a result, the local media lacked depth of coverage on pressing environmental issues. The media needs to play a more proactive role in creating awareness of these issues in a similar way to what is being done by media in developed countries, which provides a strong focus on issues such as depletion of tropical rain forests. In order to ensure their messages are transmitted effectively, environmental reporting must be comprehensive enough and reporters must be knowledgeable on the issues. This requires investigative reporting which is considered as a new challenge to media professionalism in the country. It is worth mentioning here that all these goals would be facilitated by the amendment of the Printing Presses and Publication Act 1984, the Official Secret Act, 1972 as well as the Internal Security Act (ISA) 1960 as discussed in previous section. The role of ENGOs, will be discussed in more detail in the ecological modernisation (EM) section 10.4.5.

10.4.4 Green supply chains

The MPOI does not operate in isolation, but it is influenced and affected by the value systems of the individuals or organisations in its supply chain. Over the last two decades, supply chain relationships have moved from adversarial exchanges towards more collaborative ventures. The green supply chain of the MPOI is paramount to ensure sustainability of the industry. The problem is that all of the palm oil companies interviewed have not yet been sufficiently motivated, or are unwilling, to integrate their businesses into green supply chains. None of them encourage their distributors and/ or suppliers to practise environmental management.

The green supply chains of the industry require a close cooperation of all important stakeholders in the industry. A green supply chain in the MPOI would place a greater emphasis on mutual interdependence and a win-win solution. Unlike the supply chain in the industry's earlier days - which was notably based on sellers (palm oil companies) and buyers relationships - today many other stakeholders are involved in supply chains,

including financial institutions, ENGOs, the Palm Oil Association, distributors, government agencies, consumers, and manufacturers. Through such collaboration, a palm oil industry green supply chain can minimise risks, reduce investment costs, share green costs of investment, spread risks and at the same time gain more access to resources. Moreover, collaboration can be used as a marketing edge for green products. At present many consumers, notably in Europe, complain that they cannot easily differentiate whether palm oil products come from environmentally friendly entities or not. Since palm oil is widely used in foods it is easily diluted, but by harnessing palm oil green supply chains, customers can easily trace their suppliers and producers. There has been a positive sign for this mechanism, since a number of major distributors of palm oil in European countries have restricted their purchases of palm oil to supplies from palm oil companies that complied with their social and environmental standards.

10.4.5 Ecological Modernisation (EM)

The suggestions above involved the individual role of the government (through the improvement in environmental regulations enforcement, MBIs), palm oil companies, other stakeholders - such as ENGOs, and the public. Another recommendation, which is complimentary with individual roles of these organisations, is through a mechanism that is known as ecological modernisation (EM) of the MPOI. EM proposes that institutional change must occur at the macro-economic level through broad sectoral shifts in the economy via new and clean technologies in the industry (Gibbs, 2000 p.12). It is encouraged by a market economy and facilitated by an enabling state. In order to be successful it involves the following four structural changes of the industry in the country, in line with the principles of ecology.

(i) Capitalising on science and technology pertaining to the MPOI

In line with the principle of EMT, the MPOI should move forwards from end-of-pipe to a cleaner technology, which is characterised by more efficient consumption and production, technology innovation through dematerialization, energy saving and clean technology. In this study it was found the MPOI, especially its large companies, can be said to be well on the early road to EMT. They have made significant strides in reducing water and air pollution, efficient use of chemicals, controlling soil erosion, recycling of

EFB, recycling fibres, and increasing OER. But nevertheless, there are some practices yet to comply with EMT. Areas where some improvements are still needed include reducing the high amount of water use for processing.

At present, only a few companies fully utilise their POME as a source of methane gas to use to generate turbine power to process FFB. Since Malaysia is not advanced in this technology and is unlikely to develop such a technology on its own, one of the easiest ways to acquire the technology is to buy this technology from developed countries. The MPOI should take the advantage of technological innovation in the area in developed. In addition, there are positive indicators for adopting this technology as an increasing number of EU companies try to find partners to extract methane gas from POME ponds. This venture provides a win-win situation, as the EU companies can claim carbon credits from their own governments due to their green policies. Cooperation with EU and Japanese companies is one of the ways for the Malaysian palm oil industry to gain technology enhancement. For example, methane gases from POME ponds can be tapped to generate industrial energy. As a CDM, palm oil companies that utilise it will be able to sell certificates of emission reduction (CER) to generate an income.

Another important practice of MPOI activity that violates of the concept of EMT is 'dematerialization'. At present the MPOI expands at the expense of the country's tropical rainforests, as it occupies a lot of land to increase palm oil production. This is evident, as an increment of the export of its palm oil in Malaysia is proportional to an increment in acreage of palm oil plantation. In the interviews it was found that the studied companies have relied more on new land expansion into forests, rather than using techniques to increase yield per hectare of the existing plantations. None of companies have a policy to avoid expanding their plantation's area, and focus solely on overall oil yield. This is apparent, since when lands are no longer available in Peninsular Malaysia, companies move to East Malaysia. And when suitable land is no longer available in East Malaysia they move to neighbouring countries, chiefly Indonesia, and repeat the cycle of deforestation.

In line with principle of 'dematerialization' in EMT, such a practice should not be allowed to continue. In order to avoid such a damaging practice the MPOI need to go for 'superindustrialization' in line with the EMT principles. Hence, palm oil companies

need to invest in R&D to produce high yield breeds, disease resistance, and to improve techniques of extraction of palm oil, and simultaneously invest in ways to reduce the number of labourers so as to minimise operational costs. A further effect of limiting expansion of new plantations would be to drive producers in Malaysia towards mechanisation that reduces operational costs. Although it cannot be denied that at present, big companies especially have spent a considerable effort on this path, they have preferred to open up more plantations rather than rely on R&D because the former is less risky. For instance, during the interviews, the top management of one palm oil company commented that a long-term research programme is all very well, but it will only produce results over an extended period of time, and in the case of palm oil industry it would take at least 20 years to know precisely the potential results of new breeds of oil palms.

(ii) Increasing the importance of market dynamics and economic agents

Another way to avoid environmental degradation associated with the MPOI is through the internalisation the externalities (the environmental costs). This ensures the price of palm oil reflects the actual costs (economic, social and environmental) of palm oil practices. Each economic agent - customers, consumers, financial institutions, insurance companies - should play their roles in respect to ecology. For example, financial institutions should take into consideration of the environmental impacts of their clients and will not finance environmentally controversial projects such as those that involve the HCVF. Customers must be willing to pay for green products. Since most of MPOI products are exported, consumers of importing countries should be willing to pay a 'premium price' for the Malaysian palm oil. Nevertheless, one important question here is, if almost 60 percent of the Malaysian market consist of developing countries, how can their consumers contribute? This will be achieved if environmentally conscious customers in those countries are prepared to support MPOI products. Judging from huge population of these countries, especially India and China, if 10 to 15 percent of their population are environmentally conscious consumers, this would be a good outlook for Malaysia. Furthermore, if rationale of payment for green products is supported by the rest of consumers in developed countries, there are more chances that environmentally friendly practices within the industry will be successful.

(iii) Changing role of the state / the government

The state needs to be modernised to ensure it plays an important role in directing the production and consumption of palm oil in line with the EMT principle. The federal and state governments of Malaysia need to enact reforms to change their structure. The government needs to provide mechanisms for the introduction of MBIs and at the same time to allow private economic entities to trigger environmental reforms, for example, introducing the eco-labelling exercise as was discussed earlier.

In terms of the state governments, their policy of awarding a very large forest concession at little cost to the both the GLC and non-GLC palm oil companies should be curtailed. If this is allowed to continue it will not encourage the MPOI to resort to technology to increase its palm oil yields, as a cheaper alternative (land expansion) is available through expansion. Such reforms would, of course, generate an outrage among palm oil companies. However, through proper environmental education that inculcates awareness of environmental conservation among the management of palm oil companies, such resistance would be reduced. When land is becoming more 'scarce' palm oil companies could not help but concentrate on R&D to find a high yield breeds which produces better fruit bunches and oil extraction rates.

In order to achieve these reforms, both the state and federal governments need to cooperate. At present, the state governments promote land expansion to gain revenue from the industry. In Malaysia, since the state government is entitled to collect revenues from its lands, it depends on land as a main source of income. In is not uncommon for the states to de-gazette their forest reserves to gain revenues from timber concessions, and later turn them into palm oil plantations. The restriction of land expansion for plantations will only succeed if the state governments can be fairly compensated for their actions. The federal-state relationship should be changed to allow more revenue from palm oil to be retained by the states. One way to achieve this is through a new mechanism related to the existing export tax on palm oil. The federal government should allow some portion of palm oil export taxes to go the respective state's assets, as compensation to those states that restrict the expansion of lands for oil palm plantations.

Another means by which the government can encourage sustainability of the industry is to the public and ENGOs to be involved in decision making for the betterment of the environment. It must also allow the public and ENGOs to review its decisions and give them more access to government information. By so doing the public and ENGOs to become more engaged in environmental discourse. Thus promotes a more transparent government and simultaneously avoids any controversial decision making by the government. In Malaysia there is a clear sign of this improvement. The DOE, MPOB, and the Environmental Quality Council have invited certain ENGOs to become members of the Council's board to discuss environmental issues, as well as advise the government on matters pertaining to environmental issues. These activities will foster partnerships between the government authorities, businesses, and ENGOs in an attempt to develop a more sustainable community.

(iv) Modifying the position and ideology of social movements

Social movements such as ENGOs need to concentrate more on collaboration with the MPOI and the state government. It cannot be denied that the ENGO's pressure on the government was partly responsible for the establishment of the DOE in the late 1970s, and that a number of protests against government projects have been successful in preventing unsustainable development of Malaysia forests, ENGOs are still perceived as outsiders rather than the government's partners sustainability issues. They need to find a better way to engage the MPOI and the government. In this study, ENGOs who preferred co-operation instead of confrontation with the industry were more likely to be considered as legitimate and more likely to engage them in environmental discourse. In the same vein, the ENGOs who chose a confrontational approach need to change their strategy to a more diplomatic approach and to find ways to engage the government and the MPOI in productive dialogue on environmental issues. This does not mean, they need to abandon their criticisms against unsustainable palm oil practices.

10.5 Suggestions for Future Research and Improvement in Methodology

10.5.1 Suggestions for Future Research

It is acknowledged that research on corporate environmentalism is in its infancy in developing countries. But nevertheless, businesses cannot afford to neglect the

management of environmental issues in the future, with increased internalisation and globalisation of environmental issues. Thus researchers need to update their research agendas. While in this study the researcher identified and categorised the proactive palm oil companies and which stakeholders they perceived as impinging on them, future researchers need to focus their studies on them. And in such a study what are the areas researchers need to concentrate on? The results of this study showed that, proactive companies are more likely to exercise high level environmental practices, notably at the tactical and strategic level. In relation to this, future studies should concentrate on the issues of the implementation of EMS, environmental audits, and a company's structure, to name but three. Additionally, this study identified high pressure stakeholders came from regulators, company's top management, ENGOs, and the media. Further research should attempt to expand on how these stakeholders use their power to exert pressures on the industry. For example, top management of the industry was identified as a strong pressure group on companies' environmental management. Research as to how they play their roles, and how their activities affect their companies corporate environmentalism should be taken into consideration. Within the same company why are some mills ISO 14000 certified and why are others not? The role of a mill manager cannot be under estimated, and is therefore worthy of study.

At the other extreme, future researchers can also investigate corporate environmentalism of 'black sheep' companies. According to the data they are small independent mills, operating without having their own palm oil plantations. Since they were identified as the major culprits pertaining to both mill effluent and air emission violations, such a study would unfold their current environmental practices, as well as barriers against environmental management improvements. The results of this kind of study would generate valuable suggestions to address their environmental problems.

In the study it is obvious that the large palm oil companies are more likely to implement proactive environmental strategies. Since the late 1990s a number of big Malaysian companies have been investing in Indonesia to tap into cheap labour resources as well as the availability of suitable lands for oil palm plantations. Nonetheless, some of these companies have been blamed for open burning and tropical rainforest depletions albeit this is strongly denied by the companies. Hence, it would be interesting to conduct a similar study of their corporate environmentalism as it applies to their operations in

Indonesia which has different environmental legislation and different degrees of stakeholders' pressure compared to Malaysia. This study is recommended as further research to identify any similarities and/ or differences of their environmental management practices, as well as to gain a deeper insight into the relationship between stakeholders' environmental pressure and environmental strategies.

10.5.2 Improvement in Research Methodology

The researcher has spent three years to complete this research, and in so doing he has gained experience, learned valuable lessons, and gathered invaluable knowledge pertaining to study of corporate environmentalism in the MPOI. If he was to embark on the same research again, a different approach would be applied. In this study measurement of the environmental strategies and environmental effectiveness was solely based on a mixed methods research - quantitative (seven-point scale items) and in-depth interviews. In order to increase a validity of the study, future researchers need to triangulate these data with other quantitative data. For instance, at a company level, a company's resources can be measured based on its financial statistics such as sales, net profit, return on investment, and the amount spend on research and development, to name but a few possibilities. Moreover, environmental effectiveness of a mill can be measured in terms of monthly data of biochemical oxygen demand (BOD) of POME effluents and Ringelmann Chart of air emissions, the amount of money expended on de-sludging for certain periods of time, over 20 years time for example. In both plantations and mills one can gather data related to environmental accidents, fines and court cases in relation to number of palm oil mills. A company's efficiency can also be measured based on the OER of their mills, and average FFB per hectare. One of the advantages of using quantitative data is that one can construct a ratio where the numerator and denominator are in the same units. But nevertheless, one of the main challenges of using such quantitative data for a study is, in fact, how to gain access to this information, since not all the data is easily available to the public, an such access would require a close cooperation with both the MPOI participants and government authorities.

References

Acronyms used in Reference list

ACCA	The Association of Chartered Certified Accountants
BRIMAS	Borneo Resources Institute Malaysia Sarawak
DOE	Department of Environment
ENSEARCH	Environmental Management and Research Association of Malaysia
ESCAP	The United Nations Economic and Social Commission for Asia and the Pacific
FoE	Friends of the Environment
OECD	Organisation for Economic Co-operation and Development
WCED	World Commission on Environment and Development
WWF	World Wildlife Fund for Nature

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APPENDICES

APPENDIX A : QUESTIONNAIRE

A study of Corporate Environmental Management in Malaysian Palm Oil Industry (MPOI)

General Instructions

The main aim of this research is to study corporate environmental management in Malaysian palm oil industry. The following questions seek general details of management perception of stakeholders environmental pressure, company environmental strategies and their effectiveness as well as competitive advantages. Most questions can be answered by circling the appropriate answer. Please read the questions and their respective answer carefully.

Section A. Company Profile and Interviewee Profile

1. Interviewee Profile
a. Highest educational qualification ……
b. Job title/current position ……..
c. Years in current job…….
d. How many years you have worked at your company?.....

2. Company Profile
a.Year of establishment…….
b.Major business activities……..
c.Financial contribution of palm oil industry to against other business activities ……%
d.Total number of employees.....?
e.Number of employees in palm oil industry……..?
f.Total oil palms planted area……..hectares.
g. Number of mills ……refineries…….oleochemical plants……

Sector B. Company Resources

3. On a seven-point scale ranging from "1=scarce to 7 = abundant", assess your company possession of the following resources. Please circle

Resources	Scarce						Abundant
a.Financial resources	1	2	3	4	5	6	7
b.Physical resources (e.g. equipment)	1	2	3	4	5	6	7
c.Human Resources	1	2	3	4	5	6	7
d.Organisational resources (e.g. having well-established quality control systems and cash management systems)	1	2	3	4	5	6	7
e.Technological resources (e.g. unique technologies to produce quality products)	1	2	3	4	5	6	7
f. Company's reputation	1	2	3	4	5	6	7

Section C. Stakeholder Pressure

4. Your organisation interacts with a number of stakeholders, all of whom have interests in environmental performance of your organisation. Using a scale of "1= very low pressure to 7 = very high pressure", to what extent do the following stakeholders exert their influence or exercise power on your organisation to be more environmentally conscious? Please circle

Stakeholders	Very low pressure						Very high pressure
a.Shareholders	1	2	3	4	5	6	7
b.Financial institutions	1	2	3	4	5	6	7
c.Insurance companies	1	2	3	4	5	6	7
d.Environmental Regulator (e.g. Department of environment (DOE)	1	2	3	4	5	6	7
e.Local communities	1	2	3	4	5	6	7
f.Employees	1	2	3	4	5	6	7
g.Customers	1	2	3	4	5	6	7
h.Media	1	2	3	4	5	6	7
l.Suppliers	1	2	3	4	5	6	7
j.Distributors	1	2	3	4	5	6	7
k.Competitors	1	2	3	4	5	6	7
l.Non environmental governmental organisation (ENGOs)	1	2	3	4	5	6	7
m.Malaysian Palm Oil Associations (MPOA)	1	2	3	4	5	6	7
n.Malaysian Palm Oil Board (MPOB)	1	2	3	4	5	6	7

Section D. Environmental Strategies

5. The following statements related to environmental strategies taken by your organisation. Using scale "1=least practise, to 7 = highest practise", how strongly do you agree and disagree with the following statements.

5(i). Operational level

Environmental Strategies	Strongly disagree						Strongly agree
a. More efforts are taken to reduce consumption of water	1	2	3	4	5	6	7
b. More efforts are taken to reduce consumption of electricity	1	2	3	4	5	6	7
c.Reuse of waste material is not highly practised in our organisation.	1	2	3	4	5	6	7
d.Widely use of eco/environmentally materials	1	2	3	4	5	6	7
e.Creating a market for waste/by products	1	2	3	4	5	6	7
f.Introducing new agricultural techniques to increase efficiency in plantation	1	2	3	4	5	6	7
g.Introducing new production process to increase efficiency (e.g. Oil extraction rate [OER])	1	2	3	4	5	6	7
h.Investing in new and cleaner palm oil mill effluent treatment in the past 5 years	1	2	3	4	5	6	7
i.Controlling and reducing of open burning in plantations	1	2	3	4	5	6	7
j.Controlling and reducing of air emission in palm oil mills	1	2	3	4	5	6	7
k.Reducing usage of chemicals in plantation	1	2	3	4	5	6	7
l.Action taken to reduce run-off and sedimentation in plantation	1	2	3	4	5	6	7
m.Reducing impacts of business activities on flora and fauna	1	2	3	4	5	6	7
n. Have proper incentive programmes that reward ideas for environmental performance for employees	1	2	3	4	5	6	7
o.Involving in any R&D to find way of improving environmental performance	1	2	3	4	5	6	7
p.Having emergency preparedness and action	1	2	3	4	5	6	7
q.Reducing consumptions of fuel for logistic activities (e.g. transportation of fresh fruit bunches [ffb])	1	2	3	4	5	6	7
r. Little application of marketing strategies related to environmental management.	1	2	3	4	5	6	7
s. Putting a cost (in monetary terms)on environmental programmes or projects	1	2	3	4	5	6	7

5(ii). Tactical level

Environmental Strategies	Strongly disagree						Strongly agree
a.Setting environmental standards for suppliers	1	2	3	4	5	6	7
b.Suppliers are audited for their environmental dimensions	1	2	3	4	5	6	7
c.When making sourcing decisions, criteria that include or exclude suppliers based on their environmental dimensions	1	2	3	4	5	6	7
d.undertaken any projects (EMS for example ISO 14000, TQEM etc.) that may improve environmental performance	1	2	3	4	5	6	7
e.Little attempts are made by to evaluate the whole life of our product pertaining to the environment	1	2	3	4	5	6	7
f.organisation plays an active role in environmental management in Malaysian palm oil industry (e.g. Roundtable Sustainable Palm Oil (RSPO etc.)	1	2	3	4	5	6	7
g.Publication of environmental management to employees through newsletter, bulletin or procedures	1	2	3	4	5	6	7
h.Publication of environmental management to external stakeholders (eg. Environmental report on its own or in annual report, or website)	1	2	3	4	5	6	7
i.Little effort taken by our organisation to include stakeholder consultation in environmental management	1	2	3	4	5	6	7
j.Involve in projects or environmental activities with stakeholders for the betterment of the environment	1	2	3	4	5	6	7

5(iii). Strategic level

Environmental Strategies	Strongly disagree						Strongly agree
a.In general members of the board the director do not concern of our environmental performance	1	2	3	4	5	6	7
b.Our organisation integrates environmental issues with long-term business strategy	1	2	3	4	5	6	7
c.Our organisation has written environmental mission statement	1	2	3	4	5	6	7
d.Our organisation has written environmental policy	1	2	3	4	5	6	7
e.We set our organisational environmental objectives to be achieved	1	2	3	4	5	6	7
f.Someone are responsible for environmental management in our organisation	1	2	3	4	5	6	7
g.Top management level shows little involvement in environmental management in the organisation	1	2	3	4	5	6	7
h.Our organisation periodically conducts environmental audit of our environmental performance	1	2	3	4	5	6	7
i.Our environmental committee or group has a direct influence on top management	1	2	3	4	5	6	7
j.We provide our staff training in environmental management	1	2	3	4	5	6	7
k.Only high level of staff involve environmental training at our organisation	1	2	3	4	5	6	7

Section E. Environmental Strategies Effectiveness

6. This statements related to effectiveness of environmental strategies taken by your organisation. Using scale "1=strongly disagree, to 7 = strongly agree", how strongly you agree and disagree with the following statements.

Environmental Effectiveness	Strongly disagree						Strongly agree
a.Our company complies with environmental laws	1	2	3	4	5	6	7
b.We have made high level of investment in new technology	1	2	3	4	5	6	7
c.Our environmental strategies have reduced operational costs of doing our businesses	1	2	3	4	5	6	7
d.We have received little complaints against our activities the past 5 years.	1	2	3	4	5	6	7
e.In the past 5 years we have less environmental accidents in our company.	1	2	3	4	5	6	7
f.Our environmental system is very effective to deal with environmental issues.	1	2	3	4	5	6	7
g.We have very good relationship with our stakeholders pertaining to environmental management.	1	2	3	4	5	6	7
h.We have exercised high public environmental disclosured of our business to our stakeholders.	1	2	3	4	5	6	7

Section F. Competitive Advantage

7. Using a scale "1 = not result in competitive advantage (CA), to 7= resulted in competitive (CA) advantage", how you rate your competitive advantages as a result of your current environmental strategies?

Competitive Advantage	Not result in CA						Result in CA
a.Lower insurance premium	1	2	3	4	5	6	7
b.Cheaper finance	1	2	3	4	5	6	7
c.Improved community relations	1	2	3	4	5	6	7
d.Increased staff commitment	1	2	3	4	5	6	7
e.Improved product quality	1	2	3	4	5	6	7
f.Improved materials efficiency	1	2	3	4	5	6	7
g.Positive pressure groups relations	1	2	3	4	5	6	7
h.Improved media coverage	1	2	3	4	5	6	7
i.Assured present and future environmental compliance	1	2	3	4	5	6	7

APPENDIX B : Interview Protocol and Questions for Managers of Palm Oil Companies

Corporate Environmental Management in Malaysian Palm oil Industry

Interview Protocol

Thank you for your participation in the study.

This research aims to increase understanding on why and how Malaysian palm oil companies respond to stakeholders' pressures pertaining to environmental issues. How the companies response to these pressures is defined as their environmental strategy. In addition management perception of competitive advantages of environmental strategies adopted by their companies is investigated.

The study will include palm oil companies listed in the Kuala Lumpur Stock Exchange (KLSE) or subsidiary of conglomerate companies in the KLSE where palm oil activities are part of their businesses. The interview will follow a guide but will use a conversational style to allow for a free flow of ideas. If you feel strongly on any issue or have more to add you should feel free to voice your opinions.

Ethical considerations in relation to this interview are as follows:

1. All information given will be only used for the purpose of the study.
2. There is no obligation to answer any or all of the questions.
3. The organisation and individual involved in the study will be anonymous.
4. The interview will be audio-taped with interviewee's permission.
5. Once the interview data is transcribed, a transcript will be sent to you so that you have the opportunity to correct any errors or delete any items you wish.
6. Should you be interested in a final result of the study, a summary of the results will be sent to you upon completion.

Tape number …… Company……... Interviewee …….

Date …….. Time started…….. Time Finished……..…

Interview

Section A. General Questions

i. What are you main responsibilities/duties?
……
……
……..

ii. As far as the palm oil industry is concerned what issues or challenges confront your company?
……
……
……
(If no environmental issues mentioned, interviewer will ask interviewee what environmental issues are faced by his/her company).

iii) Could you give some comments on the sustainability of the Malaysian palm oil industry?
……
……
……

iv) Do you see environmental issues in the palm oil industry as threats or opportunities? Explain
……
……
……

Section B. Stakeholder Pressure

In section C of the survey questionnaire i.e. Stakeholder Pressure [show the interviewee their earlier responses] you have identified the extent to which you believe various stakeholders exert influence or exercise power on your company to be more environmentally conscious.

i) Why those stakeholder(s) do you consider exert the most pressure? Why?
……
……
……

(ii) How do you deal with their pressure?
……
……
……

Section C. Business Environmental Strategies

1. Operational Level

Could you please explain the environmental initiatives taken by your company in both plantations and palm oil mills in the following areas.

a) Reduction of: (i) water, (ii) fuel (iii) electricity, usage
……
……
……

b) Recycling/reuse of waste materials.
……
……
……..

c) Use of eco-friendly materials (e.g. biodegradable plastic bags for young oil palms).
……
……..……....……
……..……..……

d) Reduced usage of chemicals in plantations (e.g. pesticides, fertilisers etc.)
……
……

e) Creating a market for waste products(by-products)
……
……
……

f) Introduction of new production processes to increase the oil extraction rate from fresh fruit bunches.
……
……
……

g) Investment in new and cleaner POME treatment plants (e.g. membrane filter).
……
……

h) Control and reduction of air pollution (open burning and mills' emission)
……
……..……

i) Reduced impact of plantation activities on flora and fauna
……
……
……

j) Please explain any other environmental initiatives taken by your company your activities?
……
……
……
……..……..

2. Tactical Level

a) When making sourcing decisions are there criteria that include or exclude suppliers/contractors based on their environmental activities?
……
……
……

b) Do you encourage your distributors to increase their environmental practices? If so, how?
……
……
……

c) Has the company undertaken any projects (EMS, for example ISO 14000; TQEM etc.) that may improve or enhance environmental performance?
Yes …… No……

If yes, how many of your plantation/mills have been certified……and how many are in the process of been certified by the standard?.....
If no, why ?
……
……

Do you have any intentions to undertake such projects in the future?
……
……
……

d) Is there any attempt made to evaluate the lifecycle of your palm oil product (from cradle to grave/LCA/traceability) as it pertains to the environment?
……
……
……

e) Does your company play an active role in environmental management in the Malaysian palm oil industry? (e.g. Roundtable Sustainable Palm Oil (RSPO etc.)
……
……
……

f) Does your company publish details of its environmental management policies/initiatives or strategies?
……
……
……

3. Strategic level

a. Is the board of directors concerned with the company's environmental performance?
……..……

b. Does your company integrate environmental issues with its long-term business strategy?
……
……
……

c. Does your company have a written environmental mission statement?
Yes …… No……

d. Does you company have a written environmental policy?
Yes …… No……

If yes, what environmental aspects are included in your environmental policy?
……
……
……

e. Does your company set environmental objectives to be achieved?
Yes …… No……

If yes what are they?
……
……
……

f. Who is responsible for environmental management in your company?
……
……

g. Can you explain the involvement of top management in environmental management in your company.
……
……
……..

h. Who is the environmental leader in your company?
……
……

i. Does your company have environmental officers/environmental engineers?
Yes …… No……

If yes what are his/her duties?
……
……

j. Does your company conduct an environmental audit of its environmental performance?
Yes …… No……

If yes who conducts the audit: Internal auditor…….. external/third party auditor……

How is the nature of the audit determined?
……..……

Does it comply with any known international standards?
…….
(If it complies with any known standards – ask): Can you identify the standards?.....

k. Has an environmental committee, team, or working group been formed within your company?
   Yes …… No……

   If yes, what is its functions?
   ……
   ……

   How significant is this committee/team/working group within the company?
   ……
   ……

   Does the committee/team/working group report directly to top management?
   ……
   ……

   Does the committee/team/working group have its own budget ?
   ……

   How many people are involved in the committee/team/working group?
   ……

l. a) What types of environmental training does your company (whichever term you decide) provide to your employees?
   ……
   ……
   ……
   b) At what level of the company (whatever) are employees trained in these issues?
   ……
   ……
   ……

Section D. Environmental Effectiveness and Competitive Advantage

a. Has your company been fined in the past five years because of non-compliance with environmental regulations?
   Yes …… No……

   If Yes ……what amount …….under what section…….of environmental regulations.

   Any court case pending? …….

b. At present what is your level (%) of compliance record for POME treatment at your palm oil mills?
   ……

c. Do you perceive any cost reductions or increases from your environmental practices?
……
……
……..……..
(Expected reduction will be in the usage of energy [electricity and fuel], water, by-products, and chemicals (pesticides and fertilizers).

d. Has your company (pick name) received any environmental awards or recognition of environmental achievement in the past five years? (From *eg* government bodies, magazines, environmental groups?
……
……
……

e. Overall what, if any, competitive advantages do you anticipate as a result of the current environmental management strategies in your company?
……
……
……

Section E: Barrier of environmental management.

What factors, if any, have prevented your company (pick name) becoming more environmentally responsible?
……
……
……
……
……
……
……

Section F: Ways to Promote Environmental Management

What policies/initiatives do you believe should be taken by the government to promote the development of corporate environmental management in the Malaysian Palm Oil Industry (MPOI)?
……
……
……
……
……
……
……
……
……

THANK YOU FOR YOUR COOPERATION AND PATIENCE

APPENDIX C : Interview Protocol and Questions for Stakeholders of Palm Oil Companies

A study of Corporate Environmental Management in Malaysian Palm oil Industry

Interview with MPOI stakeholder

Interview Protocol

Thank the organisation and the individual candidate for their participation in the study.

The aim of this research is to study why and how Malaysian palm oil companies respond to stakeholders' pressures pertaining to environmental issues. How the companies respond to these pressures is defined as environmental strategy. In addition management's perception of competitive advantages from environmental strategies adopted by their organisations will also be investigated.

The Interview with your organisation is paramount to gain a more rounded view of the abovementioned issues. The main purpose of this interview is to seek your perception of environmental issues in Malaysia and corporate environmentalism in the palm oil industry. The interview will follow a guide but will use a conversational style to allow for a free flow of ideas. If you feel strongly on any issue or have more to add you should feel free to voice your opinions.

Ethical considerations in relation to this interview are as follows:

1. All information given will be only used for the purpose of the study.
2. There is no obligation to answer any or all of the questions.
3. The organisation and individual involved in the study will be anonymous.
4. The interview will be audio-taped with interviewee's permission.
5. Once the interview data is transcribed, a transcript will be sent to you so that you have the opportunity to correct any errors or delete any items you wish.
6. Should you be interested in a final result of the study, a summary of the results will be sent to you upon completion.

Tape number …… Company……... Interviewee …….

Date …….. Time started…….. Time Finished……..…

Section A: Organisation and interviewee Profile

1. Organisation ……
2. Number of staff/members ……
3. Number of years the organisation has been established ……
4. Interviewee job title/current position ……
5. Years working with the organisation ……
6. Years in current job/position …….
7. Any Qualifications you have obtained ……..

8. What are you main responsibilities/duties in the organisation?
   ……
   ……
   ……

9. What are your organisation constraints and challenges in relation to MPOI/environmental issues in Malaysia?
   ……
   ……
   ……

10. What challenges do you face in performing your duties in your organisation?
    ……
    ……
    ……

Section B. General Questions

1. What environmental issues are faced by Malaysia at present?
   ……
   ……
   ……
   ……
   ……
2. What factors do you perceive have contributed to these environmental issues?
   ……
   ……
   ……
   ……

3. Do you see any conflicts between environment conservation and economic development in Malaysia?
   ……
   ……
   ……
   ……
   ……

Section C. Palm oil industry, the environment and stakeholder pressure.

1. What environmental issues are caused by the Malaysian Palm Oil Industry?
   ……
   ……
   ……
   ……
   ……
   ……

2. What strategies have been taken by palm oil companies to address these issues?
   ……
   ……
   ……
   ……
   ……

3. Why do you think palm oil companies have undertaken these strategies?
   ……
   ……
   ……
   ……
   ……

4. How committed are Malaysian palm oil companies to addressing the environmental issues cause by their activities? Why do you say so?
   ……
   ……
   ……
   ……
   ……

5. Could you elaborate on the approaches or strategies undertaken by your organisation to exert pressure on the industry to be more environmentally and socially responsible?
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   ……
   ……
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   ……
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   ……
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   ……
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   ……

6. To what extent do you think these approaches or strategies have exerted pressure on the industry to be environmentally responsible? Why?
   ……
   ……
   ……
   ……
   ……

7. Does your organisation have any project/collaboration/consultation pertaining to environmental management? Does your organisation engage with palm oil companies?
   ……
   ……
   ……
   ……

8. Is it easy to obtain environmental information from palm oil companies? Please elaborate.
   ……
   ……
   ……
   ……
   ……

9. How do you perceive your relationship with palm oil companies?
   ……
   ……
   ……
   ……

10. Do you perceive any competitive advantages gained by Malaysian palm oil companies resulting from being environmentally proactive? Why?
    ……
    ……
    ……
    ……

11. In your opinion what are the possible ways to increase corporate environmentalism in the Malaysian palm oil industry? Elaborate
    ……
    ……
    ……
    ……
    ……
    ……

THANK YOU FOR YOUR COOPERATION AND PATIENCE