KNOWING SCALE: INTELLE©TUAL PROPERTY RIGHTS, KNOWLEDGE

SPACES AND THE PRODUCTION OF THE GLOBAL

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ABSTRACT

In this article, I am concerned with the importance of knowledge spaces to the construction and politics of scale. I draw together literatures on re-scaling with feminist critiques of knowledge to show how struggles over the scale at which knowledge claims are represented and legitimized are an important, and under recognized, element of rescaling. I draw from Neil Smith's (1984) concept of scale jumping to see the construction of the global space of knowledge as a scale jump in which one particular situated knowledge, Western folk belief, is redefined as global and universal. What distinguishes it from other forms of local/anecdotal/unrecognizable knowledges is its relation to power and its capacity to achieve a scale jump in which it is defined as global knowledge. I contrast the social, economic and power relations associated with knowledge in the village of Puno in the Philippines with those of technoscientific knowledge, as manifested by regimes of intellectual property, to show that knowledges are not a natural way of understanding a separate, pre-existing world but inform how that world is experienced. I build upon David Turnbull's (1997) concept of knowledge spaces to reveal all knowledges as not only arising from a particular context but also as *creating* that context.

KEYWORDS

Scale, intellectual property, knowledge, Philippines, globalization.

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INTRODUCTION

I sit in the house of Gigi Salas from Puno in the Philippines, eating a lunch made of fresh organic produce on red-grained, fragrant rice. It has all been grown on her 1/8 hectare unirrigated plot in the mountains of Panay. The kitchen is festooned with drying corn, okra, winged bean and several rice varieties that she has selected to use for next year's seed. On her tiny farm, Gigi grows enough food to feed her extended family. She has done this alone, with the assistance of her children, since her husband died 24 years ago. As we eat, we continue our interview and I listen to Gigi tell me that she has no special knowledge about farming:

> 'I have no knowledge of farming secrets or farming techniques of how to improve things,' she says.

Having spoken to many other farmers in the town, I am not as surprised as I was when I first heard this response. It is clear that Gigi is proud of what she can do, proud of her ability to provide but my question has not called upon her to acknowledge this experience and wisdom. Instead, she sees this 'special knowledge' that I ask about to be a disembodied, secret knowledge; a knowledge held by scientists and outsiders, those with 'book learning.' Yet it is precisely this individualized and secret knowledge that lies at the core of debates over intellectual property. What we see is a monumental problem of translation. Two concepts form the basis of the way a community sees the world; one is laden with power and international backing and the other is viewed by these power centers as 'local' and 'traditional.' These concepts of knowledge come from very specific social, economic and

cultural milieus. The ways in which they are defined, diffused and interact with each other shed light on the creation of space, scale and the construction of the global.

In this article, I draw together work on the social construction of scale, in particular that associated with re-scaling and scale-jumping, with literature on situated knowledges to elucidate the importance of knowledge to the creation of scale. Struggles over the scale at which knowledge claims are represented and legitimized are an important, and under recognized, element of rescaling. I look to the case of intellectual property rights which have, since the 1980s, massively expanded in scope (to include coverage of plants, animals and processes and, through their definition as central to 'free trade,' to cover all WTO member states), comparing and contrasting it to the ways that knowledge and ownership are understood by the people of Puno from Panay in the Philippines. This investigation reveals the contested, hybrid and multiscalar nature of knowledges and the importance of struggles over knowledge to scalar politics.

Working in particular with Neil Smith's (1984) concept of scale jumping, I propose that the space of globalized and universalized knowledge regimes such as those associated with intellectual property rights are created as a result of a power-laden scale jump in which a situated knowledge space is redefined as global. The 'god-trick,' as Haraway (1997) terms it, of Western science in which it is positioned as placeless and subjectless (while being heavily laden with place, politics, history and actors) is a result of scalar politics and power moves that have led to a contested (re)creation of scale. The 'trick' of Western knowledge is not only to make the knower invisible and eradicate place, but to perform a scale-jump to define the embedded, messy world of Western knowledge as universal. As a knowledge ostensibly without place, so Western knowledge is redefined as the knowledge of all places.

As a device to help elucidate the important relationships between scale and knowledge, I conceptualize the places of knowledge/power production as *knowledge spaces* that are contested spaces thick with social relations. The term, knowledge space, comes from the work of David Turnbull in which he investigates the spaces within which certain knowledges become possible (Turnbull 1997). Here it is important to move beyond oversimplified views of situated knowledges as 'local' knowledges. I expand upon the concept of knowledge spaces to draw out the hybrid and contested nature of these spaces, and the importance of power in their construction and maintenance. Knowledge spaces, I contend, in that they represent the regimes through which truth, knowledge and power are created, are crucial in understanding the creation of scale and scalar politics. Knowledge needs to be understood as an integral part of how space and scale come to be.

There is much as stake in this struggle over the scales of knowledge production. The ability of a farmer to save her seed, for example, in the Philippines is ultimately decided through struggles over the scale of knowledge spaces. If a Western technoscientific approach to intellectual property is defined as global thereby encompassing everyone, no matter where they work their land and till their seed, the Filipino farmer's own knowledge and ownership frameworks will be subsumed beneath the knowledge space of the West. The re-scaling of the ability to define what counts as legitimate knowledge from a 'local,' 'regional' or 'national' activity, to a 'global' one is a re-scaling that both reflects changes in knowledge/power relations and actively consolidates and reinforces them.

SCALE AND KNOWLEDGE

With the incorporation of intellectual property into the World Trade Organization (WTO) and the adoption of the agreement on Trade Related Intellectual Property Rights (TRIPs), the implementation of an 'effective' regime of intellectual property has become a global imperative. All WTO member states are required to provide 'patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced' (WTO 1994). Since the passing of the agreement, countries from Argentina to Uzbekistan have passed laws enshrining intellectual property protection on plants and animals. These laws, for the large part based on the European-based standard of International Union for the Protection of New Varieties of Plants (UPOV) or the US patent standard, outline a common set of conditions knowledge must satisfy in order to become recognizeable and owneable[1]. For UPOV, varieties must be new, distinct, uniform, and stable. For patents, it requires novelty, non-obviousness (or inventiveness) and utility (or industrial application). In this way, a western framework of knowledge/property has become globalized while knowledge systems associated with different scales are made invisible (unrecognizeable) or, at least, unowneable in any capitalist sense.

This process, and the contestation around knowledge/property, is bound up in the construction and politics of both scale and knowledge. Despite its avowed technical and objective basis, the specific ideas of knowledge that underpin the concept of patenting and intellectual property rights are intensely culturally embedded (Parry 2002; Perelman 2002). The technoscientific approach found in the concept of IPR developed from a very specific geopolitical milieu. The way it is currently manifested speaks to a tangle of historical and spatial interconnections infused with power and place[2].

Even a cursory look at the defining characteristics of patentable seed reveals their links to an industrial system of agriculture and illustrates some assumptions and priorities associated with this knowledge space. The Plant Variety Protection Act of the Philippines is based, like most new IP laws adopted by developing countries, on the UPOV system. The characteristics necessary for such protection foreclose many other approaches. The required newness, for example, means that the information or seeds can not have been shared but must be secret and individual; the need for distinctness eliminates seeds created through incremental changes season by season; uniformity requires homogeneity and an absence of diversity; and, stability means seeds that are static, unchanging and locked into their attributes. The attributes of a more diverse, communally oriented, incremental, shared and dynamic agriculture are thus excluded from such requirements at every stage.

Yet through the globalization of intellectual property, the situated nature of this approach to knowledge, its relation to capitalism and the specific messy Western history that created it are subsumed. In becoming a globally enforceable norm, a knowledge framework without place, so it becomes a framework of all places. Intellectual property thus represents a rescaling of knowledge. The rescaling of knowledge becomes possible, among other things, due to the power of pro-IPR countries in the WTO, the changing discourses of 'fairness' around global trade rules, and the effective lobbying strategies of business coalitions. It is, in short, the result of a will to power and a profound illustration of the power of defining a situated knowledge as global and anti-place. With the passing of each and every law allowing intellectual property on plants for the first time, the right of farmers to collect and save seed is legally regulated and the internal spaces of the seeds brought into the capitalist system.

The importance of struggles over scale for the expression and consolidation of social power has become increasingly recognized in geography. With this recognition has come a significant and growing literature on re-scaling and scale-jumping. Work on re-scaling is based upon an appreciation of the political and social nature of scale (Cox 1998; Howitt 1993; Gough 2004). Scale is understood as produced through political, cultural and economic struggles. The central point is that, 'scale is not necessarily a preordained hierarchical framework for ordering the world – local, regional, national and global. It is instead a contingent outcome of the tensions that exist between structural forces and the practices of human agents' (Marston 2000: 220).

Scale here is understood as neither an absolute formulation, nor a methodological abstraction (Delaney and Leitner 1997; Herod and Wright 2002; Marston 2000; Williams 1999). Rather, scales are reproduced in material power relations (Cox 1997; Jonas 1996). This points to the importance of scalar discourses, of struggles over the association of social processes with a particular scale, to social and political realities. The work of Susan Mains (2002), for example, reveals how notions of scale are deployed by the US Border Patrol along the US/Mexico border to naturalize the border and to manipulate or 'erase' the identities of individual migrants. Individuals become redefined as part of an abstract national and international 'problem' while the integrity of the (naturalized) nation is protected through material (fences, detention centers and patrols) and discursive (television announcements featuring dangerous immigrants) means.

Scale-jumping refers to the ability of actors to redefine processes, issues and outcomes as a product of, and producing, a certain scale. It is important not to interpret the terminology of a 'jump' in a way that implies a transition between different and pre-existing scales. Rather the

power-move is one that constitutes scale as it attains it (Herod and Wright 2002). Smith (1984) identifies scale-jumping as a response of elites to move between and redefine scales in ways that are conducive with their desired outcomes. Manuel Castells (1996) identifies such elites as 'switchers.' Power is identified in a globalizing society as the ability to construct links between scales and networks. This means that when political-economic activity switches, or becomes identified with a different scale, this is a result of power relations.

Other work has focused on the potential scale-jumping holds for oppositional social movements. Herod (1991) stresses the importance of labor to the construction of political scales and investigates scalar struggles associated with capital/labor relations (see also Gough 2004; Herod 1997; Wills 2000). Such work reveals that rescaling can be a central component of class struggle (Gough 2004). Kitchin and Wilton (2003) turn to disability activism to assess the effectiveness of scale-jumping as political action. Their study points to the tensions that exist between the effort of activists to move between scales to effect positive social change and the constraints placed upon those efforts by actors seeking to maintain existing scalar relations (and oppressions). Smith and Kurtz (2003) study the threatened auction of New York City's community gardens to show how advocates were successful in renegotiating the scale in which the political conflict played out by defining the problem at a broader scale. In doing so, community garden activists were able to mobilize more people, resources and political power and so prevent the auction. Scale-jumping is thus a means of acquiring, exerting or resisting dominant power relations.

This work sees rescaling largely in terms of economic, social and class relations. In this article, I stress the need to extend such important understandings of rescaling and scalar politics to epistemological sites of knowledge production. Jones (1998) points to the need to

understand scale as epistemology. Scale is a site of political contestation over knowledge production as well a site of (and the outcome of) material power struggles (Jones 1998; Newstead et al 2004). Soderstrom's (1996) work reveals that notions of scale inform the way that a city can be known. As urban planning introduced the idea that a city could best be understood through maps or information pertaining to zones such as poverty or housing statistics (which represented a change in scale associated with knowing a city), so the very idea of what a city was came to change. The scales for understanding the city jumped; politics and policy followed.

The case of intellectual property points to the importance of scalar politics of knowledge and its epistemological and material dimensions. The construction of scale is, above all, a conceptual lens which empowers a certain way of seeing and understanding the world promoting certain interventions and ways of knowing, while delegitimizing or subsuming others. It is clear that in the case of intellectual property rights, the scale at which 'legitimate' knowledge is defined will have considerable material outcomes. 'Global' knowledges will be policed by the World Trade Organization, and so will affect farmers' rights to collect seed, and to own and control their intellectual property in every WTO member country. Similarly, the relegation of some knowledges as 'local' delegitimizes these knowledges (Haraway 1997).

Turnbull provides a helpful conceptual tool that can be used to draw together work on knowledge and on the social construction of scale. Here, I will turn to his work, and insights from feminist critiques of knowledge, to build a picture of the importance of knowledge to the creation of scale.

KNOWLEDGE SPACES

The claim of Western Science to be absolute and universal has been brought into question by feminist work on knowledge (Haraway 1991, 1997; Harding 1998; Hartsock 1983; Hill-Collins 2000) and through contributions from geography and the social sciences more broadly (Livingstone 2003; Pottier 1999; Chambers and Gillespie 2000; Ishizawa and Grillo Fernandez 2002). Feminist theorists have revealed knowledge as context bound and partial, rather than detached and universal (see Haraway 1991; Harding 1998; Moss 1993; Nast 1994). The process of 'decentering' that acknowledges other ways of seeing and knowing the world in addition to Eurocentric ones has been a central feature of work on knowledge (Turnbull 1997). Studies have looked to certain indigenous knowledge systems that, for example, may be very adept at cataloguing habitats and ecological settings (Johnston 2000) and medicinal plants (Mahapatra and Panda 2002), or generating planting calendars from the stars (Peat 1997).

Many critiques of knowledge, however, rely on thin understandings of both space and scale. Within work on indigenous knowledge systems, for example, space tends to be viewed as an unproblematic container, a natural and authentic local theater within which indigenous knowledge systems develop and are played out. The role of knowledge in creating this space, in producing the world within which these knowledge systems exist, and the scalar politics that surround claims for 'local' and 'universal' knowledge frameworks is missed.

David Turnbull's concept of knowledge spaces is an exception as it allows for an understanding of the links between knowledge and space at all scales. According to Turnbull, all knowledge traditions are spatial in that they link people, sites and skills (Turnbull 1993-4; 1997). He suggests that scientific production can be usefully viewed as a social activity and

that the history of knowledge production is a 'history of the contingent processes of making assemblages and linkages, of creating spaces in which knowledge is possible' (1997: 553). Turnbull (1999: 43-44) draws on Deleuze and Guattari's concept of the assemblage to denote the 'amalgam of places, bodies, voices, skills, practices, technical devices, theories, social strategies and collective work that together constitute technoscientific knowledge/ practices.'

Turnbull introduces the concept of knowledge spaces to refer to the space within which different knowledges are conceivable. These are the spaces from which knowledges arise but also spaces that are, in turn, shaped by these knowledges. This provides a mechanism for understanding all knowledges as situated in a particular geo-historical context (whilst going beyond understanding this context as 'local') and also for extending the notion of contextualization to one of co-creation. Truth is defined within a knowledge space as are the subjects and objects of knowledge, the means and ways through which something is evaluated as true and useful, and the repercussions of this truth. Such definitions are reliant on people and social relations, on power, production and reproduction, and lead to entirely different understandings (and so creations) of the world in which one lives. Knowledge spaces are the thick social spaces through which truth, knowledge and power are created.

To better understand knowledge spaces and their relation to the creation of scale, as well as to delve further into the importance of knowledge to the politics of scale, I turn to the case of Puno in the Philippines. In looking to Puno, I am not contrasting a pure local knowledge with the global messiness of technoscience, but rather drawing upon a complex multiscalar and situated knowledge space that in part absorbs, rejects, resists, embraces and overlaps with Western knowledge spaces.

THE RESEARCH

As an isolated and impoverished village, Puno faces many of the impacts and pressures felt by rural Filipinos, particularly those who live in the country's rice bowls. Puno is one of the 'the Hamlets,' several upland *baranguays* (or neighborhoods) in the mountains in the center of the island of Panay (see Figure 1). The Hamlets are small villages (with a population ranging from 119 to 518 people). The area has a total population of 2,457 in 337 households; an average of 7 people per household. Puno, with 501 people, is one of the largest *baranguays*. The community of Puno is cut off from markets and the only way in and out is by foot. The people of this area are largely involved in the subsistence production of rice. To get to the market involves carrying produce on a four hour hike through the mountains followed by a (minimum) hour's ride on a four-wheel drive jeep.

In this article, I draw upon research I conducted over 18 months in the Philippines where Puno was one of my major sites. I interviewed 30 households in the community with the interviews lasting for 2-5 hours each. I stayed with different members of the community, moving around so that the burden of feeding an extra person, and also the status associated with housing an international guest, could be shared. The interviews were conducted in Karay'a, the main language of the village, and occasionally in English or Tagalog (the official language of the Philippines) when speaking policy makers and community organizers.

During the interviews, I was accompanied by a research assistant who translated when the interviews were in Karay'a. Although I could largely understand the interviews, this served as a way of validating my own language skills and in helping deepen my understanding of issues that needed cultural, rather than strictly, language translation. To this end we spent an hour discussing each interview after it had occurred. It is difficult to translate concepts of

ownership of knowledge when the question of whether knowledge and information should be shared or sold is largely moot. The interviews involved questions relating to knowledge and ownership but also day-to-day practices of seed sharing and life strategies. This approach was aimed at understanding knowledge and property in a broader context. The work was also supplemented with 18 months of participant observation in a farmers' organization active in the village.

Insert figure one: Map of the Philippines showing Panay Island

SEED AS AN EXPRESSION OF COMMUNITY, HISTORY, FUTURE

In Puno, rice production is a vital part of the community's work to both sustain and reproduce itself. The role of farmer means being a custodian of knowledge and skill, and of the material expression of this knowledge and skill, which is the seed. Knowledge and production systems are understood as resulting from the labor of farmers, farming families (including those that are now dead) and relatives who have sustained, developed and worked with rice over time.

In a day-to-day sense, knowledge is created and shared through experience both on the family farm and through work on the farms of neighbors. Most people, both women and men, need to supplement their income doing labor on other farms. Word will get around that intensive labor is being undertaken on a certain farm and those wanting to help in exchange for rice (*pakyaw*), for money, or because they are involved in a system of reciprocal free labor (*dagyaw*) will turn up. It would be considered rude to refuse work to someone who arrived on the appropriate day to help with planting, maintenance or the harvest. In this way, rice seeds are exchanged, and farming techniques and knowledge are shared. The stress placed on

information shared and experienced is a key area of divergence from the technoscientific knowledge space that adamantly prioritizes trust in experts.

Clara and her husband Emmanuel, for example, own a farm of 1/5 hectare. Both Clara and Emmanuel work as farm laborers, for a portion of rice or for free, on many other farms during the harvest. In this way they gather new information and seeds as well as contribute to their subsistence.

'We work harvesting on many farms,' Clara tells me. 'We see different seeds and different techniques. If we see a seed has a good performance, we keep the seeds we are given in payment - we don't eat them - and use them for seeds on our farm. I don't have specialized knowledge. If I use the seed I will try to find someone who has used them already and follow that advice when it comes to my farm. If someone wants my seeds, I give them instructions on how to use it because I want to share the experience I have when growing such seeds. I learn by building on what I observe. I see what my co-farmers are doing and then I find a technique of my own as I test to see if seeds give me a good production. We don't hear about techniques coming from the government but it is the co-farmers who share our experiences of how to improve our farming activities.'

Not only is the notion of the outside expert disrupted but also the idea of individual ownership. A variety developed by one farmer would be viewed largely as collective property. The seed developer would be compelled to share by the prevailing moral authority toward reciprocity and would not be seen as the individual owner of the knowledge associated with developing the seed. After all, the parent materials would have come from the community, the farmer's expertise in farming would have been developed by her family and

neighbors, advice on specific breeding steps would have been given by numerous people from the village, and the process of planting and harvesting would have been done by not only the farmer but with the help of neighbors and a broadly defined groups of friends and relations. In such a system, the awarding of a monopoly right to this single farmer on the basis of the ideas and creativity associated with breeding a new variety is inconceivable.

Insert figure two: Rice terraces of the Hamlets

There is a strong social consensus around the need to share information, experiences and material possessions in Puno. With respect to rice seeds, a person who due to a poor harvest or other extenuating circumstances might be forced to eat the seeds that should have been saved for the next season's planting can depend upon their neighbors to give or loan seed. In the case of a loan this is usually interest free although some families without sufficiently strong ties or social capital may sometimes have to pay interest in the form of extra rice. Similarly, it is expected that farmers will share their seeds with others if the variety they use is particularly healthy or abundant. To refuse such a request would be considered extremely rude and would break the social norms that tightly bind the community.

As Gigi Salas explains, 'Everyone owns the seeds. I am not the only one allowed to use it. If anyone wants to use the seeds I will give them the seeds with instructions on how to use them. I have to do that for my neighbor. I couldn't say no.'

This reciprocity, however, is not unconditional. The intense relationships of mutual obligation that exist in the village sometimes involve considerable disparate power relationships. If seed is loaned, swapped or even sold, the receiver is indebted to the provider. The debt may be

repayed through rice or money but the social aspect of the debt is more enduring. It may mean the receiver is obliged to work on the farm of the provider or the debt may, in fact, never be called upon. Its existence, however, lends status and respect to the person who can provide and will have a beneficial effect on their place in the village hierarchy.

Farming knowledge is also seen as something that is developed by farmers (those farming their own plot) rather than by farm laborers who are perceived as following the instruction of others rather than innovating. The status accrued, and the social debt conferred, by sharing a variety would be associated with the plot's manager rather than the laborers. The roles of farmer and farm-laborer are mostly somewhat blurred as many people own some land but need to supplement their income with labor on the land of others and/or are involved in reciprocal labor arrangements with other farmers. Never-the-less the farmer/farm laborer dynamic leads to a hierarchy of knowledge production.

Rice in Puno has taste, texture, smell and history. It exists and has been developed at the center of a web of labor and multigenerational social relationships. Such notions are far from the (purportedly) place-less, people-free rice covered by the 'new,' 'distinct,' 'uniform,' and 'stable' of intellectual property. The ways of knowing of people and the community in Puno work through, around and against dominant knowledge spaces that are nevertheless present and powerful within the space of the village. Although constructed as consumers rather than producers of knowledge and technology in a technoscientific knowledge space, it is clear that the people of Puno are far from passive. Their work organizing workshops on breeding and their pursuit of alternative forms of agriculture that I will talk about below, reveals knowledge not only as a site of struggle but as a potential site for the creation of alternative futures.

HYBRIDITY, FLUIDITY AND RESISTANCE

Puno's small size and relative isolation does not mean that its knowledge frameworks are stagnated, unchanging or somehow authentic. They are hybrids, constantly evolving due to local needs, discoveries and demands, as well as in response to influences from further afield. Much of the literature associated with 'IKS' (indigenous knowledge systems) implies a knowledge that is static and uncontested. Descriptions of indigenous knowledges systems can imply an ancient and unchanging pattern and set of relationships with the environment (see for example Mahapatra and Panda 2002, Renteria 1999, Johnson 2000). However, there is no such thing as a 'traditional,' unchanging knowledge nor an unproblematically local one.

The adoption of many high yielding rice varieties through the Green Revolution in the 1960s and 1970s, for example, along with the associated agricultural techniques and attitudes dramatically changed the way of life for those in Puno. The high yielding 'miracle' rice varieties were accompanied by a package of techniques, materials (including the pesticides and fertilizers), infrastructure, and the knowledge frameworks of Western science and modern, industrial agriculture. The Green Revolution has been critiqued for its tendency to reframe farmers as passive recipients or at best as diffusers of information and technology (Kaviraj 1997; Marglin 1996). As many of Puno's farmers associate 'special farming knowledge' with scientists and those with 'book learning,' it is clear that this attitude is manifested in Puno. However, the knowledge spaces of the village are far from static or passive. The responses of the farmers to the Green Revolution and technoscience are contested and ongoing.

The dynamic nature of knowledge spaces is emphasized by the fact that most respondents replied with information about early high yielding varieties such as IR8 or IR64 when asked

about 'traditional' varieties. It is not that they do not remember the pre-Green Revolution varieties; most farmers, even those too young to have been farming in the 1960s can recite the names of varieties such as kotsiam, karibo, tumanan and pilit intingyo that predate the Green Revolution. Some still cultivate such varieties and they can be seen in the markets and growing in the watershed in the mountains above the town. It is just that high yielding varieties and techniques now occupy the position of traditional, or the 'old' ways, in the local imagination. The movement of high-yielding varieties from being 'new' varieties and 'miracle' varieties to 'traditional' varieties occurs not just as the community absorbs the knowledge frameworks and reworks them to make them their own, but also as the very meaning of the HYVs is contested and challenged. Struggles over meaning and interpretation of different positions occur constantly as the knowledge space is defined and redefined by different actors in different ways.

Insert figure three: Seed is life: this photo is from a farmer's house and shows different varieties of rice hung from the rafter.

Such an attitude points to the danger of unproblematically privileging 'traditional' knowledges and of understanding knowledge spaces as discrete and bounded. In reality, knowledge spaces run into each other. They overlap and merge, and are distorted and fractured. There is no authentic knowledge that can be attributed to the true traditional. As such, it is not appropriate to talk about 'local' and 'traditional' knowledges that are impacted upon by Western frameworks. The idea that Filipinos or the farmers of Puno hold an unproblematically privileged epistemological position reinscribes the concept of 'native informants' that Spivak argues is 'a name for that mark of expulsion from the name of Man - a mark crossing out the impossibility of the ethical relations' (Spivak 1999: 6). Spivak (1999:

39) suggests that the polarization of the West-and-the-rest is a 'legitimation-by-reversal of the colonial attitude itself.' Rather, all actors, including the farmers of Puno and social movements need to be acknowledged as knowledge producers, working with hybridized and situated knowledges that interpolate mainstream discourse as 'alternatives.' Their process of knowledge production is as political and culturally contextual and as non-innocent as other knowledge claims.

KNOWLEDGES AS RESISTANCE

The reworking of knowledge associated with the Green Revolution and, more recently with branded, hybrid and genetically engineered seeds, is an important form of resistance. One alternative discourse that has entered the knowledge milieu in Puno is that of organic farming and farmer empowerment. Brought by church workers, the university outreach program, and organizers from a non-government organization called MASIPAG, this discourse is portrayed as new, advanced and scientific by its advocates who relegate HYVs to the 'bad old days.' Organizers also work to stress the active nature of farmers' knowledge, the importance of the village's knowledge base, and the specificity (and inappropriateness) of technoscientific approaches.

A corn breeding workshop held in Puno illustrates the point. The aim of the workshop is to show people how to improve their corn through conventional breeding with a broader goal of instilling the idea that the people themselves have the skills to conserve their genetic resources and to actively improve their crops. For the workshop, 25-30 people, many of them women, cram into the church hall while children run in and out. With much laughter, the processes of sexual reproduction of the corn are discussed and the farmers decide on a plan to trial some different varieties in the village.

The organizers see themselves as trying to counter the passivity engendered by the technoscientific approaches that imply knowledge and skill come from scientists and experts outside the community. They have identified the 'colonization of the mind' as a key consequence of the Green Revolution, the corporatization of agriculture of which intellectual property is a central part and of 'corporate' globalization.

In promoting farmer-bred varieties based on non-HYV strains of rice and organic techniques these new alternatives in some way build upon 'traditional' rice strains and subsistence agricultural techniques. Yet to see these practices and varieties as 'traditional' would be to misconstrue their role in the active creation of alternatives. These techniques, including the option they have for a full subsistence agriculture in which inputs are no longer purchased, are viewed in the village as potential successors to an industrial agriculture. Rather than going back to 'traditional' ways, the farmers see themselves as moving beyond the problems of the Green Revolution.

Rice and knowledges associated with farming are embedded in broader cultural and social landscapes. The individual is central in the Western patent system which, for example, excludes communally held, shared knowledge as neither novel or non-obvious. The effect of such individualization in Puno, however, has been incomplete. The increasing need for inputs associated with HYVs and hybrids has actually promoted communal approaches as people work together to minimize losses. Many farmers, for example, report that levels of cooperation and sharing have increased in recent years. This challenges the easy conception that strong ties of reciprocity are a remnant of the authentic past threatened by today's techniques.

'*Bayanihan* or as we call it *dagyaw* in Karay'a is the name of a Filipino tradition. It is when people help each other without expecting money or anything in return. For example, we would get together to harvest someone's farm and then another time move on to someone else's. This tradition began not to be practiced in the time of IRRI [the International Rice Research Institute] because people began asking what they could get from their neighbor. The attitudes changed. But now it is coming back again,' explains Lazaro Serag, one of the subsistence farmers in the village involved in organic farming.

Another example of how changes in knowledge change social structures is through the renegotiation of gender roles. In Puno, many of those trying organic agriculture are women. Women have tended to approach their husbands with suggestions on ways to change the farm. This often leads to the farm being split with one proportion of it being given over to trial organic farming methods and the rest left to high input techniques. If successful, the whole farm will be converted. This represents a major shift in decision making structures within the family as women uncharacteristically make suggestions on the running of the farm and, from there, about other key decisions such as education for the children.

These resistances highlight the fact that the politics of scale and knowledge are not confined to struggles over the global versus local but are important to the construction of all scales of experience. Strategies of resistance interpolate and define different scales. Farmers' organizations, for example, work to frame the issue at island (calling for ecological integrity in the form of islands free of genetically engineered products), local government (as local governments draft initiatives against intellectual property in their municipality) and national

scales (including the use of 'nationalistic' ideas to claim ownership of the knowledge-base of the Philippines for Filipinos rather than citizens of foreign, IP-rich countries).

SCALAR POLITICS OF KNOWLEDGE

Despite the slippages and contestation around technoscientific knowledge in Puno discussed above, however, the legalities associated with patents, and the physical means employed by companies to protect their brands, result in a very real power imbalance. Not only is communal knowledge not recognized as legitimate and patentable under IPR, but customary practices of a more communally oriented nature such as seed saving and sharing (of protected seeds) are re-inscribed as illegal, subject to up to seven years in jail in the Philippines. This is both an epistemological and a material change as the situated knowledges and worldviews of farmers worldwide who see seeds as communal or as the product of work or of God(s) or of mother nature, is swept aside and legally redefined as the product of invisible scientists selling their intellectual labor to transnational corporations.

Intellectual property rights are rights of exclusion that allow authors of knowledge to control access to their 'creations' (Drahos 1996; Gottweis 1998; Letterman 2001). To become defined as an author, for what you have authored to be defined as legitimate and recognizable knowledge, is to be enabled by the structure. Corporations who invest in intellectual property are empowered under regimes of IPR. There is no pre-existing condition of being 'information rich,' as this is precisely what is negotiated through the workings of power in knowledge regimes. Knowledge regimes create knowledge producers and knowledge consumers as some knowledge is identified as legitimate and others as invisible in the system.

23

In creating awareness of patents and hybrids, community organizers in Puno try to prevent farmers from entering the system unaware and so being caught in a cycle of seed purchasing. Only seeds with an 'inventive' step can be patented and seeds in the public domain such as farmer-bred seeds are theoretically exempt from IPR[3]. As such, farmers using farmer-bred seeds should not be affected. Yet the aggressive promotion of branded seeds, the company 'technicians' that visit villages, the give-aways and the inflated promises of guaranteed high yields draw farmers into the system. For some, particularly those with capital enough to purchase the required inputs, higher yields may offset costs. For others, such as the farmers of Puno who have poor access to markets and grow mostly for subsistence, receiving promotional seeds that lead them to a cycle of purchasing seeds every year presents an impossible burden.

The legal patents are just one manifestation of the relationships involved in this knowledge space. The community may find itself legally prohibited from replanting but will also find technical and social constraints in their way. Technical constraints are physical constraints bred into the plants that mean the seeds are physically unsuitable to be reused. Development of the notorious 'terminator gene' in which a plant is genetically engineered to have sterile offspring is currently on hold due to public outcry, but the use of hybrids also mean plants cannot effectively be used as seed sources as the offspring will not be 'true to type' and will have a very low germination rate.

Pablo Bonario was one of the few people in the Hamlets who had used hybrid seeds. He had done so because he had been selected by the Department of Agriculture to receive a free bag of seed to illustrate the possibilities associated with the higher yielding seeds. He had been happy with the harvest, which was higher than usual and promised many friends and other

farmers that they could have some of the seed for next season. He had saved the seed but was

appalled and very embarrassed when the seed failed to germinate. He thought it was the

humid conditions and was clearly ashamed of his inability to germinate the seed. Being

selected by the Department of Agriculture had been a major boon to his reputation. His failure

to share with his neighbors implied that he was not worthy of this honor and involved a

significant loss of face. He had no idea that the hybrids cannot be effectively reused due to

their physical constraints and, when I explained this fact to him, he became emotional.

Although geographers have rightly pointed to the flaws of a Cartesian understanding of scale

that sees a natural hierarchy from local through to the global (Herod and Wright 2002), power

relations can privilege some knowledges and scales, ascribing them a universality and

naturalness[4]. The workings of the WTO, of legal systems and of other treaties all serve to

create and enforce a hierarchy of knowledge. The 'global' knowledge space (the situated space

that has achieved a scale-jump to be defined as global) gives certain ways of acting

naturalness and legitimacy. The very definition of some knowledges as local and others as

global is key to the creation of power relationships and emerging patterns of haves and have-

nots in the global landscape (Kelly 1999). It becomes crucial to interrogate and problematize

the knowledge spaces and power relations associated with constructions of the global to lay

bare the power imbalances and unevenness inherent within it.

CONCLUSION

Knowledge must be understood in terms of its spatiality; the way that it creates the spaces and

conditions of material experience. Regimes of knowledge (whether 'legitimate,' 'scientific,'

'local,' 'folkloric' or simply invisible) create patterns of inequality, are associated with and so

(re)define scales of experience, and are resisted/accepted/subsumed in different ways. As such, they are fundamental to the continued evolution of the social landscape.

The meaning of the world, our interpretation of events, and the definition of what is global (prioritized) versus local (expendable, petty) as well as knowledges and identities associated with different scales, are all part of the contested terrain of knowledge spaces. Regimes of intellectual property rights attempt to validate one knowledge system over others, ultimately deciding who will count as a rational actor, as an author of knowledge, in the contemporary world system. Knowledge claims are created by, and create, knowledge spaces that in themselves define how we know the world. They are the ground from which epistemology and the scales of experience, including the scale of the global, arise.

Asked what they think of seeds as the creation of a mind, most farmers in Puno will start laughing, a response stemming in a large part from the untranslateability of the question. That a scientist might think up an idea and then be able to transmit this idea to a seed to the point where the physicality of the seed becomes no more than the manifestation of the idea is so improbable as to be ridiculous. My investigation into knowledge in Puno draws out the specificity, the hybridity and the fluidity of the knowledge system and in doing so sheds light onto the similarly hybrid and situated nature of Western technoscientific knowledge. To investigate the processes through which intellectual property on plants has been introduced in the Philippines is not to investigate the impact of a natural and all but universal concept of knowledge on a remnant traditional and folkloric system, but the collision of multiply situated knowledges. Each knowledge complex represents a node of power relations that exists within a complex social, political and economic infrastructure. There is a strong geo-historical materialism to their production.

The contrasts between the assumptions and ideas behind IPR and the cultures of knowledge of the people of Puno also draws out the interwoven nature of scale. The village of Puno, with no vehicle accessible road, no electricity or telephone could be seen as a quintessentially 'local' space with the knowledges of the people similarly 'local' and 'traditional.' Yet the discussion above reveals how misconstrued such notions are. The farmers' knowledges are heavily informed by their work on the soil, their position within communities and their understanding of knowledge and property. They are also informed by their participation in regional, national and international social movements and multiscalar alliances as well as a messy and hybrid history of colonization, capital-intensive agriculture and resistance. Puno is a rich place of contestation over 'global' (indeed, multiscalar) processes and struggles over knowledge. The farmers and families of Puno not only live in a world fundamentally altered by struggles over the global, but reinvent, resist and recreate it in diverse ways.

(Mis)constructions of knowledges, places and processes that associate them with particular predefined scales are not innocent but are heavily informed by the politics and power-relations associated with the scalar construction of knowledge. The scale-jump within which Western ideas of intellectual property and ownership of knowledge become associated with the global (and so become globally enforceable through the WTO) is not due to any naturalness about Western ways of seeing and understanding, but is the manifestation of embodied power relations. In the case of intellectual property, the understanding of some ways of knowing as 'local' or 'traditional' knowledge (or in fact obscuring these ways of knowing altogether) and others as 'rational,' 'universal' and 'fair' is the result of a power move that leads to the privatization of the very spaces of subsistence.

While technoscientific knowledges associated with the seeds and practices of the Green Revolution and branded seeds are well entrenched in Puno, such knowledges are not hegemonic. Knowledge spaces are contested; they co-exist, overlap, and evolve. A community's, even a person's, relationship to a certain knowledge space is complex and flexible. Western scientific knowledge spaces are implicated in creating passive subjects but this does not imply that all who live within such spaces are passive or that alternative ways of being and knowing are entirely erased. Gigi Salas, for example, introduced in the first few paragraphs of this article, talked about her lack of secret knowledge but she was proud of the experience and practical knowledge that allows her to feed and raise their family. Her on-farm innovations, the social structures that see knowledge as communally shared and her participation in training workshops of farmer-led seed breeding all point to the vibrant and evolving nature of knowledge spaces and the contested scalar politics of knowledge.

ACKNOWLEDGMENTS

FOOTNOTES

1. Although the WTO agreement on TRIPS allows countries to exclude plants and animals (except for micro-organisms) from their patent regimes, they are required to provide an 'effective' system of intellectual property protection. This requirement has largely been interpreted as requiring a minimum of UPOV plant variety protection.

2. Histories of patenting and the process though which intellectual property was included into the rubric of the WTO reveal much about this specificity. See, for example, Capling 1999; Farrands 1996; Machlup and Penrose 1950; Parry 2002; Perelmann 2002; Sell 1999; Trebilcock and Howse 1995; Wright and Wallace 2002.

3. I say theoretically here because of the growing examples of patents placed on plants used by (invisible?) communities throughout the Third World. Some of these have been successfully challenged in court. The high costs and complicated nature, however, of legal challenges mean that other such patents remain in place.

4. This point is made effectively by J.K Gibson-Graham with respect to development as they suggest '"development" is now widely recognized as a "local" project of particular Western economies and regions that very successfully became globalized (2002: 5).

CAPTIONS

Figure one: Figure one: Map of the Philippines showing Panay Island (Map produced by

Olivier Rey Lescure).

Figure two: Rice terraces of the Hamlets (Photo: Sarah Wright) .

Figure three: Seed is life: this photo is from a farmer's house and shows different varieties

of rice hung from the rafter (Photo: MASIPAG).

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