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Modes of Legitimation in Tuvalu

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ABSTRACT

The important role of knowledge about global climate change in environmental governance is investigated in this paper. The relationship between more and less 'global' and 'local' forms of knowledge in climate governance has implications for international norms of justice, national sovereignty and human and national security. This paper attempts to show how the simultaneous and seemingly contradictory trends of 'globalizing' and 'localizing' in climate governance actually serve to help legitimize different forms of knowledge. The discussion is grounded in a case study of Tuvalu, a low-lying atoll nation in the South Pacific. The Tuvaluan government's engagement with discourses of global climate change and traditional environmental knowledge illustrate the nation's attempts to maintain legitimacy in the face of undermining ecological devastation in the eyes of other nations and international investors as well as in the eyes of Tuvaluans. The paper brings together elements from a wider conversation in anthropology, science and technology studies, and political sciences.

INTRODUCTION

Global climate change is likely to initiate an immense sea change in billions of people's lives across the planet and reach deep into the foundations of contemporary international relations. Because climate change enters a world patterned with social, economic, and political variation, it will differently affect populations within and between countries. Imminent threats are posed to vast numbers of people around the world, primarily those living in extremely high density

along the coastlines of developing countries (Nurse and Sem 2001). The very existence of small island developing states, such as the low-lying Pacific island nation of Tuvalu, is placed in danger (United Nations General Assembly 1994). In this sense especially, the turbulent threats of climate change raise unprecedented and radical challenges to international norms of justice, national sovereignty, and human and national security.

The important role of knowledge about global climate change in environmental governance is investigated in this paper. While designations of local and global are unclear and falsely dichotomous, the terminology allows a discussion of place-based, experiential knowledge on one hand, and less place-specific, universalizing knowledge on the other (Latour 1991). How local understandings of climate change are incorporated or not, legitimized or not, in politics and policy has direct implications for just and effective governance. This extends not only to the realm of effective and socially acceptable policy, but also to continuity between politics and identity. The present discussion brings together elements from a wider conversation in anthropology, science and technology studies, and political sciences about the relations of knowledge and power. The role of expert institutions and knowledge has recently provoked a great deal of concern and academic attention (Fairhead and Leach 2003, Fischer 2000, Wynne 1996, Beck 1992, 1995, Giddens 1991). A case study which focuses on local responses to global climate change in Tuvalu grounds the discussion in a very real set of considerations about justice, sovereignty, and security. Although this paper champions the role of traditional and local knowledge in decision making processes, the argument is not that science and less place-specific knowledge are not critical in managing climate change.

In the first section of this paper, the emerging role of local forms of knowledge in environmental governance is explored. While local specificity is necessarily left out of much governance and policy especially at the regional level, its very absence creates the opportunity for its entrance into environmental management. This sets the scene for a discussion of how the 'apparently contradictory trends between localizing and globalizing forces are rarely so opposed' in policy and resource management (Fairhead and Leach 2003:2). Next, a historical look at how different forms of knowledge have been treated in international development and policy making is provided. The

following section takes a closer look at the politics behind incorporating traditional and local knowledge in governance and policy. Using an analytical framework provided by Fairhead and Leach (2003), problem framing and the national government as an important intermediary between local and global forces in Tuvalu are investigated in the final two sections. This paper touches on each of these issues in an exploratory fashion, but it remains at the surface of deeper intellectual inquiry which could additionally examine how science and governance intersect with national institutions through practices and debates largely shaped by earlier colonial experiences.

KNOWLEDGE IN ENVIRONMENTAL GOVERNANCE

Tuvaluan politicians warn that citizens of Tuvalu may be the world's first victims of global climate change, however, scientists remain divided about whether and how the local impacts will manifest. Unwilling to concede to the persistent debate, former Tuvalu Prime Minister Saufatu Sopo'aga avows that 'the evidence is here, and our nation is suffering because of it, what else can we say?' (Sopo'aga 2004). Although climate change implicates Tuvalu as a sovereign nation, the impacts are rooted in daily life: 'It is affecting the food supply of the island and the very livelihood of the people' (Sopo'aga 2004). During recent spring floods – which local observers claim are increasing annually in both severity and frequency and attribute to rising sea levels precipitated by climate change – a Tuvaluan journalist noted 'our island nation is sinking together with our hearts' (Silafaga Laluea cited in Hays 2005). National and livelihood securities are brought together in this sentiment, highlighting pervasive anxieties about population displacement and the loss of cultural heritage.

The governance of climate change must be effective in dealing with these anxieties at community, national, and global levels. 'Governance' is an ambiguous but increasingly popular term which 'lies in the conceptual gray zone between electoral politics and administrative rule making' (Martello and Jasanoff 2004:2). Governance, most neutrally defined, refers to the 'rules and institutions for the authoritative organization of collective life' (Donahue 2002:1 in Martello and Jasanoff 2004:2). In the context of this paper, governance includes international and national approaches to climate change and concomitant systems of power and knowledge – these are large issues

which merit intensive study beyond the scope of the present discussion.

The complexity of climate change has implications for its governance. Like other global environmental problems including biodiversity loss and ozone depletion, climate change is a complex problem which has localized causes and effects but which occurs in global proportions that transcend the political borders according to which so much of contemporary life is organized. The complexity of climate change for governance is exacerbated by its temporal dimensions. A great deal of uncertainty about climate change is bundled up in the extremely long time delays between atmospheric and oceanic feedback processes. The problem of climate change governance is therefore one which spans spatial and temporal scales as well as forms of knowledge.

One way in which climate governance is attempting to deal with the complexity of scale is through the incorporation of local and traditional forms of environmental knowledge (Global Environment Facility 2002). This comes from both so-called 'top down' and 'bottom up' initiatives. Local populations have inserted themselves in climate negotiations and frequently rely on traditional knowledge to legitimize their views. Fogel (2004) demonstrates how resistance to the Intergovernmental Panel on Climate Change (IPCC) and Kyoto Protocol has been influential in identity construction and defining roles of some indigenous groups, showing the pervasiveness of global governance in affecting local peoples' lives.

A shift to incorporate local and traditional forms of knowledge is an important movement to redress the extensively studied tendency of government officials and scientists to simplify representations of humans and environments. Such simplification allows for an essentially universal set of applications to govern complex local systems from afar (Latour 1987). Social and ecological simplification is necessary to render the local situation legible to managing authorities (Scott 1998:24). Governance, political inequality, and knowledge become intimately linked in environmental governance. The frequent failures of what Scott describes as intensively modernist plans, though, are due to their own artificiality: 'the formal schemes of order are untenable without some elements of the practical knowledge they tend to dismiss' (Scott 1998:7). Here Scott is referring to the complexity of forestry endeavors which were simplified by state policy in order to

make them manageable from a distance. Along these lines, Fogel makes the case that the global or universal knowledge transmitted by the IPCC establishes and justifies simplified constructions of people, institutions, and nature to make them tractable for governmental responses (2004:109). The effect diminishes the rights and prerogatives of local people, along with their knowledge, in the global purview. In the context of greenhouse gas emission reductions, Agrawal and Narain (1991) argue that championing such simplified, scientifically derived, and apparently value-free decision making and policy is actually profoundly political because underlying inequalities go unaddressed.

Interestingly, it is the very lack of local knowledge in much development policy and in climate change governance until recently, which has inspired active calls for its inclusion. This has come both from human rights based arguments (for example Barnett and Adger 2003) and from claims that local and traditional knowledge can offer coping and adaptation strategies to environmental change which in turn diminishes vulnerability and enhances resilience to disaster in specific locations (Berkes and Jolles 2001, Berkes and Folke 1998, Watts 1983).

Drawing on their research of forestry policies in the Republic of Guinea West Africa and the Caribbean country of Trinidad, Fairhead and Leach (2003) present a helpful analytical framework which brings together the apparently contradictory trends of contemporary globalizing and localizing forces in environmental knowledge in policy. Firstly, the authors suggest that local and global concerns often intersect in 'shared problem-framing'. This intersection may be explicitly fostered from below or above when different actors make appeals to global discourse or to local experience and participation in order to legitimize their various and overlapping claims. While this insight may obfuscate vastly different motivations behind the framing of a problem, as well as highly unequal capacities to shape the frames, it is a useful heuristic to cut through the dichotomy of local versus global knowledge. Secondly, Fairhead and Leach demonstrate the important role of intermediate processes which again deny the apparent polarity between globalizing and localizing forces. The demise or erosion of the nation-state is often implied by discussions of globalization, due either to power accumulating at the supra-national level or among sub-national organizations. However, Fairhead and

Leach argue that national level governments remain important intermediaries which articulate with and shape both local and global pressures (2003:3). The Government of Tuvalu, for example, is deeply concerned not only with global climate change but also with the governance of it, and appeals both to local and global ideas, and indigenous and scientific forms of knowledge, to legitimize its concern among Tuvaluans and the international community.

TUVALU AND GLOBAL CLIMATE CHANGE

The Government of Tuvalu (GOT) first voiced concern about global climate change 25 years ago when scientists began to suggest that resulting environmental change would manifest as rising sea levels, heightened sea surface temperatures, and increased frequency of extreme weather events (Sopo'aga 2004). The IPCC, the international authority on climate change, has stated unequivocally that human activities are the reason for observations of average warming trends across the planet over the last 50 years (McCarthy et al. 2001: 21). Precisely how these impacts will manifest, however, remains both politically and scientifically debated. At one extreme are predictions that involve the 'possible loss of whole cultures', in the words of a former chair of the IPCC (Watson 2000).

Although Pacific island countries have contributed an estimated 0.06 per cent to global greenhouse emissions, they may be the first to be severely impacted by global climate change (Tutangata 1999:11). Many Pacific island countries rise only a few meters above sea level. While climate change is a global phenomenon, it will have devastatingly local effects:

'There is an asserted consensus that binding significant targets to reduce greenhouse gases are essential, if the catastrophic impacts of climate change on the livelihood and existence of people are to be limited.... For the people of low-lying island states of the world, however, and certainly of my small island country of Tuvalu in the Pacific, this is no longer a debatable argument. The impacts of global warming on our islands are real, and are already threatening our very survival and existence' (Ede 2002: 30).

The chain of nine low-lying coral atolls which comprise Tuvalu totals 26 sq km of combined land area and spans some 900,000 sq km

of ocean area between 5°-10° south and 176°-179° east. The history of Tuvalu is important to understanding contemporary circumstances including the relationship between state, society, and environment, and how these are each implicated by processes occurring beyond and across the national border. Tuvalu's history can be traced through three phases of pre-colonial, colonial, and postcolonial conditions. Each of these overlapping phases is characterized by flows and processes which extend beyond the atoll archipelago and even the South Pacific region. Certainly this is evidenced by the current problems presented by the challenges of global climate change, as well as Tuvalu's integration into networks of international development, the global market economy, and extensive overseas travel. Tuvalu's history, from pre-historic ocean navigation to contemporary participation in the UN, belies any notion of a bounded, isolated island nation – imagery which has and continues to define Tuvalu in the eyes of the international community (Chambers and Chambers 2000).

As is the case in Pacific Island countries across the Pacific Ocean, Tuvalu has what is sometimes called a MIRAB economy – one that is based on migration, remittances, aid and bureaucracy. Traditional crops of *pulaka* (a taro-like root crop), bananas, *pandanus*, and coconuts are still cultivated but an increasing proportion of food consumption consists of imported products, especially in the national capital of Funafuti. Tuvalu's level of human development is described as middle of the range for Pacific island countries, with parameters such as a low incidence of poverty and a relatively high overall literacy rate (cite study). Income from abroad has grown in recent years, primarily due to remittances, higher fisheries license fees in the Tuvalu Exclusive Economic Zone (EEZ), and revenue from the innovative sale of Tuvalu's internet domain, '.tv', to an overseas corporation. A successful Tuvalu Trust Fund was jointly established in 1987 by the governments of Tuvalu, Australia, New Zealand, and the United Kingdom to assist the GOT to achieve greater financial autonomy and improve social infrastructure and services. Yet, Tuvalu remains deeply dependent on international aid (Knapman et al. 2002).

Due to its particular geopolitical context as a remote, least developed country (LDC) and the biophysical characteristics of atolls, Tuvalu is often portrayed in international media as the proverbial canary in a mine and predicted to be the world's first nation-state to be rendered uninhabitable by the effects of global climate change (IPCC

2001). Already, the increasing severity of annual spring flooding is being attributed by many Tuvaluans and scientists alike to global climate change:

'I am very worried about the sea levels,' said Losi Tuaga, 18, as she stood outside her home, ankle deep in seawater bubbling out of the soil. Her father, Tuaga Petelu, echoed the fears saying things were changing rapidly. 'There is a change in the sea level,' he said. 'What can we do? We have to wait and see what's happening' (Knox 2002).

KNOWLEDGE POLITICS IN DEVELOPMENT

Like other LDCs in the South Pacific with which Tuvalu shares the biophysical characteristics of remote geography and limited natural resources, Tuvalu is disproportionately dependent on international development aid. The global infrastructure of international development constructs a conceptual divide between more and less developed countries. The conceptual geography of contemporary international development maps onto earlier perceptions of the globe as divided into healthy and unhealthy climates. Arnold (1996) describes what he calls 'tropicality' as the processes by which the globe was demarcated and defined according to a discourse of pathologically safe and unsafe climates by early explorers and colonial scientists. Western medicine defined equatorial regions as dangerous in terms of their inherent threats to health and life. With the advent of germ theory and understandings that bacteria rather than climates were responsible for endemic diseases in the region, Western medicine could claim a cure to the region's intrinsic dangers. With the emergence of mainstream developmentalist frameworks – prevention of the spread of communism after WWII through market-centered approaches, a shift toward state-centered approaches in the 1960s and 70s, so-called neo-liberal revolutions in the 1980, and finally structural adjustments which strive towards sustainability in the 1990s – the discourse of 'otherness' shifted from one of pathology or tropicality to one which makes the distinction between donor and recipient of development aid (Bankoff 2004:26-27).

Alongside rising awareness of global environmental problems has come another set of coordinates by which to map the conceptual geography between the 'west and the rest.' Set against the backdrop of more or less developed countries, vulnerability to natural hazards

overlays ideas about economic and environmental instability and resilience. 'No single term has yet emerged that defines the areas where disasters are more commonplace; but whatever the denomination, there is always an implicit understanding that the place in question is somewhere else, somewhere where 'they' as opposed to 'we' live, and denotes a land and climate that have been endowed with dangerous and life-threatening qualities' (Bankoff 2004:29). The conception of disasters as unavoidable extreme physical events which require technocratic solutions continues to pervade the UN and multilateral funding agencies. This paradigm denies the multiple factors which contribute to a population's vulnerability to a hazard, and the ways in which vulnerability is constructed and socially differentiated.

Close on the heels of monolithic sustainable development and natural hazards paradigms, however, has come a counter discourse which privileges place-based, traditional knowledge. Adding yet another layer to the conceptual geography of development and disasters, then, is the assumption that people living in certain affected regions also retain arcane knowledge. This is a supposition which could perhaps easily fall back into the notion of the 'noble savage' (Bankoff 2004). The danger, then, is that hollow claims to incorporate local knowledge, cookie-cutter format, can serve to perpetuate power differentials. The move to incorporate local knowledge in development initiatives and climate governance seems to be indicative of a belated recognition that people in harsh environments, who are also frequently at the receiving end of development programs, may have developed sophisticated strategies to cope with the insecurity with which they have long lived (Gupta 1998).

LOCAL AND TRADITIONAL KNOWLEDGE

In Tuvalu traditional knowledge may indeed provide hope not least because it is a 'resource' which is wholly sourced within Tuvalu. Therefore, 'all that is required is to find the proper balance between the need for external assistance and the capacity of local people to deal with the situation' (Bankoff 2004:33). Moreover, traditional knowledge, by its very definition as a place-based and experiential form of knowledge, carries with it a sense of place (Berkes 1999). As cultural and physical attachment to place becomes increasingly tenuous in the

face of global climate change, the GOT may also legitimize a collective Tuvaluan attachment to place by incorporating TEK into national policy under the rubric of an international development initiative.

Not all place-based knowledge is traditional, indeed all knowledge has a place of origin and is in some sense local, from the field to the laboratory or boardroom. Nor is all traditional knowledge ancient. According to Hunn, 'new ideas and techniques may be incorporated into a given tradition, but only if they fit into the complex fabric of existing traditional practices and understandings. Thus, traditions are enduring adaptations to specific places...Traditions are the products of generations of intelligent reflection tested in the rigorous laboratory of survival. That they have endured is proof to their power' (1993:16). This form of local knowledge is as much about the creation and maintenance of social relations, authority, and cosmology as it is about specific phenomenon.

Berkes (1999:8) offers a definition of traditional environmental knowledge as 'a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.' Broadly, traditional environmental knowledge is understood to have components of practice as well as knowledge, linking perceptions of the environment to systems of resource management, land tenure, and sacred practices. A cosmological component of belief about people's role in relation to their surroundings is encapsulated in the worldview attached to traditional knowledge (Berkes 1999: 6).

In line with Scott's argument mentioned earlier, Sillitoe has upheld the 'anthropologically self-evident point that effective development assistance benefits from some understanding of local knowledge and practices' (1998). However, in many instances where this has occurred, the process has been far from unproblematic. The institutional context of government and NGO policy-driven research and concomitant claims to authority compels examination of underlying power dynamics, and the generalizability of place-specific knowledge (Sepez 2005).

In their study of forestry development in Guinea and Trinidad, Fairhead and Leach use the metaphor of a vortex to capture how place-based environmental knowledge (both Western scientific knowledge and TEK) is decontextualized – removed from the specificity of place –

and drawn up into a globalized realm of general policy. By the metaphor of a vortex the authors are referring to the processes by which 'the production and incorporation of 'locality' is structured and circumscribed to generate consensus and conformity in knowledge and approaches to management...in ways which are beyond the influence of any individual or organization' (2003:49). These processes entail the 'globalization of the local' in so far as places and populations are reproduced as tropes, for example, in the way that small island states have become *cause célèbres* of climate change and accelerated sea level rise. The situations, ideas, and types of knowledge embodied in tropes become a kind of common currency for both scientific and policy arenas with influence on agenda setting and national policy.

PROBLEM FRAMING

An important insight from anthropological studies of disaster is what is revealed by how problems are experienced and framed. Today's world is cast as ever more risky, with increasing potential for disasters (Beck 1992, Oliver-Smith 1996). Disasters were considered to be unpredictable and discrete phenomena caused by geological, climatological, and other physical processes until relatively recently. An initial sea-change in the theorization of disaster in the social science came alongside critiques of ecological functionalism as epitomized by Rappaport (1968). Vayda and McKay (1975), for instance, argued that disasters are as much the outcome of processes in the social world as the natural one. Subsequently disasters have been understood as part of the 'normal' functioning of ecosystems (Torry 1979) and conditions of inequality and subordination in society (Hewitt 1983). Such insights allowed disasters to be taken into account by development projects and environmental management (Glantz 1987). The impacts of climate change in Tuvalu underscore current anthropological understandings of disasters as processes which entail a human population and a potentially destructive agent embedded together in a mutually constitutive, systemic relationship that unfolds across space and over time (Stonich 1993, Oliver-Smith 2004, Wisner et al. 2004).

At the societal level, disaster paradigms have focused to varying degrees on risk (Douglas and Wildavksy 1982, Kasperson and Kasperson 2001), resilience (Gadgil et al. 1998, Palsson 1998, Alcorn and Toledo 1998, Adger and O'Riordan 2000), vulnerability (Chambers

1989, Bohle et al.1995), adaptation (Berkes and Jolles 2001), and making predictions. How disasters are framed depends on the paradigm to which the actor doing the framing subscribes and their position in relation to the problem (Kempton et al 1995). Perspective and experience are particularly important in the social framing of knowledge and science (Forsyth 2003).

Problem framing is deeply embedded in social process (Kuhn 1962, Bloor 1976). What is revealed to local actors living through or expecting a disaster (such as adverse impacts of climate change) will influence how they frame a problem. Comments from Tuvaluans about the threats of climate change frequently appeal to cultural attachment to place and place-based experience:

‘I just don’t want to believe that I’ll have to leave the country one day if Tuvalu was to sink...I would not wanna have to leave my home island. I love Tuvalu...and I...want to be here all my life...’ (Lina Timala in Horner and le Gallic 2004)

‘A big wave came ashore and covered the land. Since then people aren’t planting so much anymore. The fruit is smaller and doesn’t taste good. Sometimes it’s rotten’ (Siaosi Finiki in Levine 2002).

‘Islets that used to be my playing ground when I was ten or eleven years old have disappeared, vanished. Where are they?’ (Koloa Talake in Levine 2002).

Tuvaluan politicians speak of climate change in terms of a national crisis. In the words of one government official: ‘We don’t know what will happen in the future. We may lose our culture and our identity as Tuvaluans. It will take time for our people to accept that, once we’re in another country’ (Nelisoni cited in Lynas 2004). Framing the problem of climate change as one of national sovereignty and security is reminiscent of other developing countries in the Montreal Protocol negotiations when arguments were made in terms of equity and sovereignty (Litfin 1994). This justification itself, however, can be reframed in the argument that climate change provides developing countries with a ‘Trojan horse’ to sneak onto development agencies’ agendas and receive more aid:

‘Of course they could take a hint from the Dutch and start building dykes - if they really believe that sea levels are rising. I mean, a meter

high dyke could be built around every atoll in a matter of weeks. But that isn't the point, is it? This is really all about squeezing out more aid' (Smyth in Hays 2005).

This may be a cynical reference to what Moss means by the advantages afforded by collusion between local and global framings of a problem. By making outsiders know the author of the problem's history, it can become 'the kind of history where causal chains lead back to managed budgets' (2004:232). According to Fairhead and Leach, it is also by virtue of shared problem framing between global and local interests that even the most 'distantly local actors' in both their everyday and extraordinary circumstances may be drawn into the 'vortex' of global debate (Fairhead and Leach 2003). For instance, framings of the problems in Tuvalu which focus on the potential for traditional environmental knowledge to inform adaptation and provide resilience to environmental change come from both global and local actors. Local actors seek legitimacy in global resource management paradigms that have adopted a discourse which values traditional knowledge. Global actors in turn legitimize their framing of the problem by emphasizing the autonomy of Tuvaluans to incorporate their knowledge in management policy.

THE NATION AS INTERMEDIARY

Fairhead and Leach (2003) retain a role for the national government – in the face of increasingly powerful administration both above and below the state level – as an intermediary between globalizing and localizing forces. Martello and Jasanoff (2004) also define an intermediary power in governance but which exists for them between market and state, and therefore can include both supra- and sub-national powers. Either way, these identifications of intermediary power are a useful way to think about how the GOT has responded thus far to the challenges of climate change, uncertain science, and political debate.

In the face of impending and potentially devastating effects of climate change the GOT has initiated both short and long term responses. Considering the longer-term and possible worst-case effects of climate change on the atolls, the GOT has negotiated migration rights for a limited number of Tuvaluans to New Zealand on an annual

basis. Already, Tuvaluans comprise one of the fastest growing Pacific Islander diasporas in New Zealand. According to the 2001 NZ Census, 1,960 Tuvaluans are residents of New Zealand, approximately 6% of the total Tuvaluan population. Implied in this agreement is the GOT's recognition of the possibility that the continued viability of human habitation of the atolls is in peril. However, especially crucial because of Tuvalu's geopolitical position as a remote atoll nation with limited resources and its vital dependence on international aid, the migration agreement with the New Zealand government potentially undermines Tuvalu as a sovereign nation-state in the eyes of other nations and as a viable investment in the eyes of international donors and aid agencies (Barnett and Adger 2003).

In response to shorter term needs, the GOT has engaged in the iterative process of implementing a National Adaptation Program of Action (NAPA). NAPAs, funded by the Global Environment Facility (GEF, as the entity operating the financial mechanism of the United Nations Framework Convention on Climate Change, UNFCCC) and executed under the auspices of an Implementing Agency (the World Bank, UNDP, or UNEP) are to be integrated into the mainstream national policies of LDCs. The NAPA is primarily a sustainable development initiative intended to promote sustainable practices while diminishing vulnerability and fostering adaptation to local climate-related environmental change in LDCs.

One of the chief guiding principles of the NAPA is that only information derived from currently existing or ongoing studies and research and traditional knowledge be utilized. To date, very limited Western scientific research has been conducted to describe environmental baselines and rates of change in Tuvalu. Data which do exist is temporally shallow and cannot adequately describe long-term trends in the environment (NTF 2002, Faavae 2004, Laupepa 2004, Vavae 2004). The GOT is therefore extremely reliant on traditional knowledge about the environment, including the specialized knowledge of skilled individuals as well as the social knowledge held widely by members of a community, which may indicate crucial adaptation strategies in addition to providing imperative information about changes in the environment (Faavae 2004, Laupepa 2004). This particular national strategy to confront the challenges of climate change intersects with modes of adaptation occurring at the household level and reflects strategies employed by individuals whose

livelihoods are dependent on natural resources. Important opportunities are opened up when acceptance of the knowledge and concerns of land users, especially the 'poor' and 'marginalized,' are institutionalized at national and international levels, particularly when funding may actually depend on the incorporation of these perspectives.

As an independent nation-state, Tuvalu is in a unique position regarding its large dependence on development aid. On one hand Tuvalu seeks donor aid in support of government, education, health, and food programs. These needs are only likely to increase as uneven urbanization and climate change exacerbate existing health, waste, and food shortage problems (though the dependence could possibly be eased by other routes less reliant on international markets and politics). On the other hand, the bilateral migration agreement that exists between Tuvalu and New Zealand potentially undermines the confidence of foreign investors, aid agencies and Tuvaluans themselves in the viability of Tuvalu as an independent nation and the ability of the atolls to sustain future human occupation (Barnett and Adger 2003:329).

These actions, alongside a discourse of threatened national sovereignty, illustrate how the GOT may be negotiating between localizing and globalizing forces of science and governance to embark on an important statemaking project, advancing its own legitimacy by claiming the right to unthreatened sovereignty while at the same time focusing on the threats themselves: '[Tuvaluan] sovereignty would not be threatened....Under the Law of the Sea,...rules would apply and it would remain Tuvalu. Of course it would be mostly sea, but it would be Tuvalu land area. So we would have our claim maintained on this spot in the Pacific Ocean' Saufatu Sopo'aga (in Field 2004).

The GOT can be seen to play an intermediary role between local level resource management and global environmental governance. Through the NAPA in Tuvalu, an alliance is formed between the national government and an implementing agency, in this case both the UNDP and UNEP, while funding is provided by a globally oriented institution. Such participatory approaches can mean that 'no longer seen as merely victims of ecological breakdown, local communities and groups are instead assumed to hold some part of the solution to these problems' Martello and Jasonoff 2004:8). While these processes are political to the core in the ways that they frame policy

problems and set political agendas (Jasanoff and Marengo 2004:342), they also occur in necessarily ambiguous space of governance. Providing a more optimistic perspective to Scott's argument about simplified ideas of people and environments mentioned earlier, Moss puts forth that ambiguity in policy – for example in 'participatory approaches' – serves to conceal prohibitive ideological differences, allow compromises, and leave room for differences of opinion and multiple different criteria of success in order for all the various people and institutions involved to define their own success of the project (Moss 2004:230).

CONCLUSION

Globalization and global governance have somewhat paradoxically served to bring a more diverse array of types of knowledge to the policy drawing board and this may turn out to be exceedingly important as challenges to justice, national sovereignty, and human and natural security increase. Global and local are not self evident categories, especially given the variety of ways that each supposed category is constituted through the beliefs, decisions, actions, and practices of even the least involved actors. Given this, it makes sense that effective governance requires dynamic interaction between what is considered global and local. Importantly, inserting standardized packages of local knowledge into complex decision making processes is not a substitute for 'repeated mutual questioning between global and non-global actors' or a place holder for real dialogue (Jasanoff and Martello 2004).

Through shared problem framing and state intermediaries between local and global knowledge and practice, the effective boundaries which separate authoritative science from other forms of knowledge can be diminished. Moreover, because environmental politics are inherently place-based and gain emotional force from people's attachment to particular places, landscapes, and livelihoods (Ostrom 1990), it is important to understand that 'how people know their ways of life must be reckoned with in building the new global order' (Jasanoff and Marengo 2004:335).

Finally, understanding the role of knowledge in the governance of global climate change has theoretical as well as practical significance to the interdisciplinary effort to define dangerous levels of climate change

referred to by the UN Framework Convention on Climate Change. The ultimate objective of the FCCC is 'to stabilize greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system,' although as of yet no definition of dangerous has been agreed upon.

Because processes of knowledge making and legitimation occur hand in hand with processes of social ordering, considering knowledge of climate change across multiple scales, from local livelihoods to global scientific meetings, will elucidate an avenue along which norms of international justice, national sovereignty, and human and national security may be operationalized.

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