

**Divergent Paths: The Ontology, Epistemology, and Pragmatics of
Community-Based Conservation in Locally-Managed Marine Reserves,
Fiji**

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Abstract

With many of the world's fish stocks on the verge of collapse, the creation of sustainable *marine* conservation initiatives is now imperative. The contribution of indigenous people to the success of conservation projects has only recently been recognised. Conservation programmes are now increasingly designed to enhance the role of local people, utilise their traditional ecological knowledge, their interests and their social and economic needs.

Initiatives such as the FLMMA network represent a new paradigm of conservation strategy. By developing a common *methodology* called the learning framework that formally sets out strategies, their underlying assumptions, objectives and the modus operandi, initiatives across the network are made more effective. With reference to the political ecology and environmentality literature we are able to understand how underlying political interests impact upon communities and their perceptions of, and their relations with the environment and through a critical appraisal based on three factors; ontology, epistemology and pragmatics we can examine some of the conceptual failures of conservation initiatives

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Introduction

A ritual

It is late in the evening in the Tavua district, Fiji. We are sitting around a Tanoa¹ bowl and kava² is being distributed around a small group of men; some farmers, some fishers and one priest. Kittune Ratuba or Kiti, as he is known, passes me a bowl. As I clap before taking it to drink, Kiti tells me; *‘we protect the fish in our MPA by patrolling in a metal boat. When we catch poachers we fine them and take their fish.’* Once the brown, bitter liquid of the Cassava root passes my lips I clap again, twice. As the bowl moves on around the circle of men, Kiti continues on his role as the head fish warden for his i qoliqoli³; *‘if they don’t pay I take them to the police!’* Kiti evidently takes the business of conservation very seriously. Once a dynamite fisher himself, an issue which has plagued the Tavua district, Kiti embodies the recent wave of ‘conservation converts’ with a growing awareness of the need to actively conserve their critical natural resources. Kiti is only one man, but he is integral to the network of community-based conservation projects in the Republic of the Fiji Islands, now known as the Fiji Locally-Managed Marine Area (FLMMA) network.

¹ Large wooden bowl carved out of *vesi* wood for preparing *yaqona*.

² ‘Grog’ (ceremonial drink made from *Piper methysticum*).

³ Traditional fishing ground.

The FLMMA network represents an oceanic conservation experiment, unique in its approach. It differs from previous approaches to marine conservation⁴ such as the marine protected area (MPA) based on the terrestrial conservation models of the national park. The MPA in FLMMA constitutes only one tool among many available to communities that are seeking to manage their marine environment. The communities are supported by a number of partner organisations who provide resources and technical assistance. These make up a network of practitioners who share information and learn from each other in an adaptive way (LMMA, 2004). Critical to the philosophy of FLMMA is that the projects are entirely community-led, highlighting issues and making decisions from conception, to design and implementation.

How best to achieve conservation is one of the critical puzzles of our time (Ostrom, 2001). It has been central to debates over environmental policy and management in academic and practitioner circles for many years. Conservation involves mediating the relationship between people and their environment (Robbins, 2004). This implication straddles philosophical understandings of nature and society, practical issues of environmental governance and equity issues of the distribution of power and capital. It is often small, indigenous communities who live in regions of the world most abundant in biodiversity that are most often adversely affected by conservation initiatives (West, et al, 2006). Narratives about indigenous people, their relationship with the environment and their propensity to conserve have shifted over time (Hames, 2007). These narratives dictate that some groups voluntarily or “culturally” conserve, while others must be coerced or “incentivised” to change potentially damaging activities. This can have significant symbolic and material effects on the implementation strategies of conservation initiatives (Escobar, 1998).

FLMMA has so far received regional, and increasingly, international recognition winning a plethora of awards⁵ (LMMA, 2005; 2007). In an age in which modernity has made

⁴ The name Locally Managed Marine Reserve (LMMA) was chosen specifically to differentiate itself from Marine Protected Area (MPA) initiatives.

⁵ Two recent awards include: World Summit Award (2007) for best in e-content and creativity; and the NOAA Walter B. Jones Award for Diversity in Coastal Management.

dealing with environmental problems increasingly complex (Appadurai, 1996; Mitchell, 2000), the FLMMA network has apparently been able to avoid many of these problems, quickly generating measurable levels of success. Critical to this apparent success is how FLMMA has infiltrated indigenous communities, but also negotiated the larger world of fishing conservation. FLMMA sits at the intersection between self-managing indigenous communities and global marine conservation. As such, it is an ideal site in which to analyse the interaction between traditional ecological knowledge (TEK), marine tenure, indigenous communities and global conservation narratives. The FLMMA network is still in its infancy and there may be problems and barriers which risk its future.

FLMMA is a network characterised by multiple connections through which knowledge and power flow, mediated by and between disparate actors. It is a network which deals with, but also constructs, the relationship between three interrelated factors which will constitute my framework of analysis. Firstly, the *ontology* of the marine environment and indigenous communities; of what, for example, does the ocean and community consist, what are its basic parts, and what therefore are we seeking to manage? Secondly, the *epistemology* of knowing and learning; how do we know and understand these worlds, what do we consider to be valid knowledge (traditional experiential knowledge or scientific knowledge), and how should this knowledge of the world be collected and recorded? Thirdly, *pragmatics* of decision-making; how do we act on and manage what we know and how does both the ontological and epistemological understandings of the marine environment and indigenous communities effect decision making processes?

There is already a small, but growing, body of literature on the FLMMA network, but it has yet to be interrogated from this conceptual perspective. I will apply this conceptual framework to the FLMMA network in order to analyse this potentially new and unique approach to marine conservation. I will do this by exploring the ontological, epistemological and pragmatic aspects of both indigenous Fijian communities and the FLMMA network to see how they interact and ultimately expose any failures which might constitute a threat to the success of the network in the future.

I will argue that the success of long term self-managing community conservation initiatives is dependent on the engagement and agreement of three critical factors; ontology, epistemology and pragmatics between partner organizations and local communities. If there is a discrepancy between indigenous communities and partner organisations as to what constitutes the marine environment and how we understand it, then pragmatic management decisions will be fraught with difficulties. By highlighting and understanding the discrepancies between the different partners within the FLMMA network we can begin to see how it might (re)engage with communities to (re)develop traditional practices and engender long-term sustainable conservation.

Methodology

Designing an appropriate methodological framework with which to investigate the network is inherently problematic. Any one methodological approach or technique is unlikely to suffice in allowing the specificity of the geographic, social and political to be explored (Fontana and Frey, 2000). From the outset, the FLMMA network was problematised in the Foucauldian sense (Pryke et al, 2003). The network was conceptualised not as a pre-existing object already established in the literature, nor as a new object created through discourses. Rather, through an ensemble of discursive and non-discursive practises the FLMMA network would be constituted as an object of thought. The principle aim being to induce uncertainty and destabilise any preconceived notions of how the FLMMA network has been conceptualised in the past and create a new space in which it can be (re)conceptualised in the present (Rainbow, 2005).

This problematisation had several important implications for the architectural design of the research. Firstly, the nature of the object of study, a network, would not lend itself to the coupling of opposites, simple binary units of analysis, such as inside and outside, global and local, etc. Secondly, traditional ‘master-slave’ models of social theory where abstract theory is tasked to explain and preside over empirical observations are no longer adequate (Ortner, 2006). Thirdly, any successful conceptualisation would ultimately be

forged through the relationships between the researcher and the object of study, the network, and the people who constitute it (Hunt, 1989).

To deal with these complications a series of ethnographic techniques based on a multi-method approach, termed triangulation, were employed to achieve a broader and more comprehensive set of results (Fontana and Frey, 2000). Working within time and financial constraints the three principle research techniques used were; semi-structured interviews, participant observation, and socio-economic data (Denzin and Lincoln, 2000; Crang and Cook, 2007, Clifford and Valentine, 2003 respectively). What follows is a brief description of the research process, plus an outline of the three methods including the problems faced during the implementation of each.

General information

The research took place from Wednesday 1st July until Friday the 5th August 2009 on the largest island in Fiji, Viti Levu. Time constraints and unreliable travel to and from the islands meant that research away from Viti Levu was impractical. Viti Levu, however sites the oldest LMMAs which was desirable. The time was divided between the capital city of Suva situated in the South East of the island and the district of Tavua, the second oldest FLMMA site, situated in the North West. The University of the South Pacific (USP), the Institute of Applied Sciences (IAS) and the offices of all the FLMMA partner organisations were based in Suva. Access to the University and the affiliate organisations, so as to conduct semi-structured interviews with key informants, was established through email correspondence and telephone calls with a gatekeeper in the FLMMA network. Access to the community located in the Tavua district was assisted by the FLMMA network and USP, specifically the project liaison officer for that district who arranged accommodation with a FLMMA community representative. Access was also granted on the condition that I presented my preliminary results to representatives of the network which I did on Monday 3rd August in USP, Suva.

Semi-structured interviews

Research on the partner organisations of FLMMA required a method which was both non-intrusive and as least time consuming for the participants as possible. Many of the people interviewed were high-level bureaucrats and elite members of a community – people accustomed to efficient use of their time. The directors of the partner organisations, while willing to participate, were extremely busy and could only dedicate a small amount of time. In situations where there is a single opportunity to interview a participant, semi-structured interviewing is best (Bernard, 2006).

While the type of data collected is opinion-based, semi-structured interviews allowed me to investigate issues which fall between or below analysis or surface-level comparison because their freewheeling, ‘conversations with a purpose’, style gave an authentic insight into the subject’s experiences and involvement within the network by allowing active participation (Longhurst, 2003). Semi-structured interviews provide the freedom to follow, and develop, interesting leads whilst also allowing me control of the agenda (Bernard, 2006). This was an inherently difficult task as Cloke et al (2004) notes; interviews are inherently strongly implicated in the construction of meaning between the researcher and the participant.

The quality of the data collected from these interviews was therefore dependent on the inter-subjective relationships between me and the researched (McDowell, 2001). In almost all cases ethical problems of power inequalities were mitigated by foresight and planning before each interview (Cloke et al (2004). Each participant was contacted prior to the interview by both myself and a representative from the FLMMA network who validated my status. The interviews were conducted in a place of the participants choosing, usually their office or a more neutral location such as a café. Before the interview, the participant was given a consent form (see appendix A) which outlined the obligations of the researcher and allowed the respondent to define their terms of engagement within the research. All interviewees remain anonymous through out the text, however an interview schedule can be found in appendix B.

Socio-economic data

All the socio-economic data is collected and owned by community members. In order to access this data permission was sought from the FLMMA community representative who asked the chief of the community. Once permission was granted the data was released to me. The socio-economic data is based on the categories defined by the Learning Framework (The Locally-Managed Marine Area Network, 2003). This includes factors related to the target, direct threats, indirect threats, and the project process.

Participant observation

Indigenous Fijian communities, like other post-colonial societies, have long been the object of research. Particularly during the early development of anthropological techniques such as ethnography, native and tribal peoples were considered passive objects of study from which local epistemological understandings of the world were extracted by a dominant and active researcher. Since anthropology became more reflexive, however (see Clifford and Marcus, 1986; Marcus and Fischer, 1986), methodological approaches in ethnography have taken on indigenous approaches to research which are more applicable to the specific region in which the research is done (Nabobo-baba, 2006).

These new approaches are, ‘based on the assumption that knowing and knowledge are not accultural, but are products of, and thus influenced by, particular cultures, and should be understood through research techniques which reflect that culture.’ (Nabobo-baba, 2006: 24). Nabobo-baba (2006) in her research on the Vugalei District in Fiji employs what she describes as ‘*vanua* research⁶’. This approach takes into account protocols of relationships, knowledge and ways of knowing and is framed so that an indigenous

⁶ Acknowledges all aspects of Fijian community life: a people, their chief, their defined territory, their waterways or fishing grounds, their environment, their spirituality, their history, and their epistemology and culture.

person can appreciate and trust the researcher ultimately increasing the accuracy of the data collected.

Thus, Fijian communities have a series of formal and informal protocols which any visitor to the community must adhere to and negotiate to be granted access to the village, the people within it and their knowledge. This provided me with several ethical obstacles which I had to negotiate, including; the giving of *Sevusevu*⁷ and the taking of *yaqona*⁸ with the chief, wearing of appropriate attire in the village and recognising the multiple roles I played as researcher, guest, friend and family member to the people I worked and lived with. This often required me to go beyond being a passive observer and participate in the daily lives of the community which included collecting firewood, sorting rubbish and attending church.

Generating knowledge within the village, therefore, involved a series of iterative negotiations (Whatmore, 2003) for access to information. Knowledge was co-produced through mutual relationships of understanding based on trust (Thrift, 2003). Research in the village involved a series of negotiated practices more often than not conducted informally during *Talanoa*⁹. The *talanoa* is guided by rules of relationship and kinship, shared ways of knowing and knowledge, and worldviews. Meetings invariably began with the presenting of a gift, usually *sevusevu*, which not only shows respect to the participants but also acts as a form of consent negating the use of consent forms. Notes were not taken during the *talanoa*'s, but on occasion and when it was deemed appropriate, some conversations were recorded. Time was also allocated at the end of each day for writing up observations and field notes.

⁷ A presentation of *yaqona* to welcome a visitor or make a request.

⁸ Plant of and drink made from *Piper Methysticum*.

⁹ Story telling or interview.

Situating FLMMA within the Literature

Indigenous communities: knowledge and practise

The potential adverse affects and scale of rapid global environmental change caused by anthropogenic forces is one of the defining issues of our time. Nowhere is this more acute than in the oceans. As global fishing effort and technology have increased during the last century, declines in fish stock catches have been significant in almost all fisheries (Roberts, 2007). At a global level, 52% of world fish stocks are fully exploited, approximately 16% are overexploited, 7% are depleted and only 1% is recovering from depletion (FAO, 2004). This has led some to predict the collapse of all commercial fisheries globally by 2048 (Worm et al, 2006). Despite this, some ocean areas are still replete with life.

Fiji falls within the top 10 countries or geographical locations with globally significant coral systems situated within the Coral Triangle, an area spanning 5.7 million km² encompassing much of the South Pacific. It is home to some of the most biologically diverse marine life in the world (WWF, 2009). In the face of unprecedented environmental degradation, however, is it possible to conserve these marine environments? To answer this we need to ask, what is the marine environment made of? How can we find out and understand the marine environment? These questions are notoriously difficult to answer and have proved to be a point of contention in conservation initiatives in a variety of different environments and between the multiplicity of people who inhabit them.

Efforts to conserve the environment are often frustrated by differences in the epistemological understanding of the world between and across different societies. This has highlighted the need for conservation programmes to encompass a broader view of the role of local people in specific areas including their traditional ecological knowledge and interests and their social and economic needs (Adams and Mulligan, 2003; Zerner, 2000). The potential contribution indigenous communities could make to conservation

efforts has only recently been recognised (Berkes, 2008). Indigenous communities have, however, often been framed as either a part of nature or separate from it, which has had significant implications as to whether indigenous people are considered able to conserve their environments (Hames, 2007).

There are numerous factors that have led to the framing of indigenous people as a global concept and encouraged their inclusion in conservation. Firstly, the United Nations' "indigenous peoples' decade" (1995-2004) (Dove, 2006); secondly, resource conflicts, sovereignty disputes, and co-management issues in protected areas, have seen the development of universal human-rights' laws, and the rise of identity politics in minority groups (Appadurai, 1996; Escobar, 1996; Niezen, 2003) and thirdly, the reality that many indigenous people live in biologically diverse areas which are a priority for conservation (Maffi, 2005).

Indigenous communities are often defined in terms of history and place. Popular use of indigeneity focuses on the idea of 'nativeness' (Williams, 1983). Formal international definitions centre on historic continuity, distinctiveness, marginalisation, self-identity, land and marine tenure, and self-governance, (see the International Labour Organisation, 1989 and the United Nations, 1986 in Dove, 2006). The term is usually attributed to communities with historical continuity in resource use on an area situated in non-industrial or less technically-oriented societies.

Traditional ecological knowledge (TEK), like indigeneity, is also an ambiguous term to define. Traditional can symbolise long-term dynamic adaptation but also has simple, static and savage connotations. Ecological knowledge has modulated between a narrow definition of biological relationships in the biophysical environment and a broader definition concerning living beings and their environment. Berkes (2008: 7) provides a useful starting point for TEK with the following working definition;

'a cumulative body of knowledge, practise and belief, evolving by adaptive processes and handed down through generations by cultural

transmission, about the relationship of beings (including humans) with one another and the environment.'

Berkes attempts to get away from narrow definitions towards a recognition that traditional and ecological knowledge taken as a whole focuses on the construction of meaning rather than the object of meaning itself. TEK is concerned with meaning as a way of life connecting the knowing and the doing that emphasises knowledge as process (Berkes, 2008).

TEK operates at multiple levels in a *knowledge-practise-belief* complex. Knowledge comprises of local and empirical knowledge on species identification and taxonomy, life histories, distributions and behavior. Practice is constituted from resource management systems made up from an appropriate set of practices, tools and techniques and social institutions that are represented by codes of social relationships. Beliefs are constructed by worldviews, which shapes environmental perception. Critical, however, is the question of whether of not this complex induces intentional conservation (Berkes, 2008)?

Intentionality in conservation is divided between epiphenomenal conservation; the inability of a population to cause resource degradation; and 'true' conservation involving knowledge and understanding, termed *cognition* (Levy, 1966: 217; cited in Burch, 2007), and some level of intent or active conservation ethic (Hunn, 1982). This can include, rational action: a conscious action where the subjective and objective are the same, the result of which can be measured and secondly, non-rational action: all conscious action other than rational action including motivations that are not empirical often based on 'magic' or 'religious action' (Burch, 2007)

Smith and Wishnie's (2000) review of the ethnographic literature suggests that most indigenous people will pursue enhancement of resources needed for the maintenance of their basic needs. Their choices reflect the social and economic welfare of individuals that often has the effect of conserving habitats and biodiversity, but have not necessarily been designed to do so and may at times have the opposite effect. Thus they propose a

definition for indigenous conservation such that, to qualify as conservation, any action or practise must satisfy two criteria. It should 1) prevent or mitigate resource depletion, species extirpation, or habitat destruction and 2) be designed to do so. The design aspect is broad and able to include both intentional (conscious beliefs and preferences) and functional (evolutionary processes either cultural or genetic) aspects. In order to achieve this however, communities need to overcome the problem of temporal discounting (short-term loss in order to reap long-term gain) and collective action (when action is individually costly but collectively beneficial [or vice versa]).

Whether or not conservation is likely to occur is therefore dependent on a multiplicity of factors such as the type and characteristics of resources and the nature of the groups that depend on the resources. This might include the institutional regimes through which resources are managed and the nature of the relationship between a group and external forces and authorities such as markets, states and access to technology (Agrawal, 2003).

Global conservation

Conservation in western science has several general definitions. Broadly it implies; *'using natural resources in ways that ensure they will be available to future generations.'* (Igoe, 2004:10). It usually involves the maintenance of genetics, species and ecosystem diversity through the mitigation of resource depletion, species extirpation, or habitat destruction and often requires a costly sacrifice of immediate rewards in the short-term in order to reap delayed ones (Hames, 2007).

Terrestrial conservation models have been traditionally based on the protected area as an integral component of conservation biology and a solution to environmental degradation (Borgerhoff Mulder and Coppolillo, 2005; Igoe, 2004). The protected area is historically situated within the development of the American idea of wilderness, pristine nature, and environmentalism (Cronon, 1995; Oelschlaeger, 1993; Spowers, 2002). These narratives conceptualise nature as separate from culture, and more importantly, humans (Leach and Mearns, 1996). Wilderness is perceived as a product of modernity and reinforces modern

binary distinctions between nature-culture, human-non-human, and wilderness-civilisation (Willems-Braun, 1997).

American-style protected areas, based on notions of wilderness have spread around the world, serving as models for conservation efforts in high biodiversity regions where a large proportion of indigenous people live (Guha, 1989; Spence, 1999). Articulated in conservation policy, it produces what has been described as fortress conservation. This narrative assumes that ecosystems are threatened by human activity and the best way to restore them is the removal of people from an area. It constructs the evicted as outsiders and non-indigenous (Brockington, 2002).

The global proliferation of protected areas reached its peak between 1985 and 1995 a consequence of the 1992 World Parks Congress' target of protecting 10% of the planet's surface along with the International Union for the Conservation of Nature (IUCN) global protected area database. NGOs became the new primary institutional vehicle through which the design and implementation of protected areas and conservation targets were achieved (Igoe, 2004; West et al, 2006). This was also extended to the marine environment when the 2002 World Summit on Sustainable Development committed to establishing a representative global network of marine protected areas by 2012 and when the 2003 5th World Parks Conference recommended that these areas should amount to 20-30% globally (Wood, et al, 2008).

These targets were formed during a series of liberalisation processes such as; the introduction of the free market, the implementation of multi-party elections, the strengthening of the NGO sector and the rise of civil society (Igoe, 2004). These factors encouraged international donor agencies and NGOs to privilege aid to projects which adopted participatory research and planning methods. These projects tended to combine conservation and development policies inline with a neo-liberal orthodoxy emphasising the empowerment of local, minority and marginalised people through market mechanisms and increased democracy (Ostrom, 1990; Woodhouse, 2003).

Indigenous communities and global conservation

What do indigenous people and their knowledge have to offer global conservation initiatives? Studies of indigenous, small-scale fishers' knowledge has been shown to improve science and management in fisheries and conservation. One of the biggest ambassadors of indigenous knowledge, specifically fishers' knowledge has been Bob Johannes who highlighted what indigenous, traditional, and ecological knowledge has to offer (Johannes, 1981), and convened a conference called 'Putting Fishers' Knowledge to Work' in 2001 (Haggan, et al, 2007). In the conference brochure Johannes wrote;

'Small scale traditional fisheries are often set in environments where the scientific knowledge is poor and conventional remedies are prohibitively costly...Understanding [their] knowledge, and how fishers act on it, can contribute substantially to marine resource management.'

Another argument for including, using and maintaining TEK is the maintenance of biocultural diversity. This focuses on the link between biological, cultural and linguistic diversity. Maintaining high levels of biocultural diversity increases human resilience and adaptive capacity to environmental change (Maffi, 2005). This requires us to use and record TEK in conjunction with western science and knowledge systems. This relationship has been uncomfortable because of differences in epistemological qualities. TEK and western scientific do not share the same lexicon of the ontological aspects of the world, which hinders their compatibility. Alcorn (1993: 425), for example, suggests that there is no easy translation of 'conservation' into non-european languages. It generally translates into "respecting nature", "taking care of things," or simply, "doing things right". Moreover, some indigenous people actually find it difficult to separate the western idea of conservation from their daily lives (Borgerhoff Mulder and Coppolillo, 2005).

Advocates of TEK have emphasised the differences between TEK and western science according to three major themes 1) substantive differences that include differences in the subjective matter and characteristics of TEK and science, 2) methodological and epistemological differences where the two different knowledge structures employ contrasting methods to investigate reality, and possess fundamentally alternate world views and 3) contextual differences where TEK differs because it is more fundamentally embedded in its spatial and temporal context (Agrawal, 1995).

Agrawal (1995) takes issue with this, suggesting that people who advocate the maintenance of TEK by emphasising its differences in opposition to western science, but who also wish to examine and store it using the methods and epistemology of this science, are exposing themselves to an inherent contradiction, one that is destructive and counter intuitive to the concept of TEK. This fails to recognise important power relations at play in how TEK is generated, organised, stored and disseminated. Moreover, the knowledge gained from TEK will be restricted to the same power relations of western science which inherently restrict the marginal poor, in short – indigenous people (Fairhead and Leach, 2003). If indigenous knowledge is going to be useful to global conservation there needs to be a greater understanding of its epistemological qualities.

Networks

As conservation initiatives become more decentralised in new co-management initiatives, the alignment of indigenous communities and global conservation becomes more difficult. The rise of new networks of epistemic communities could be conceptualised as a specific response to the problem of compatibility and coordination between the ontological components of community and epistemological understandings of knowledge production.

How we understand and define the community is critical. The role of community in expanding the strategies for achieving conservation would be better understood by *'focusing on the multiple interests and actors within communities, on the process of how these actors influence decision-making, and on the internal and external institutions that*

shape the decision-making process' (Agrawal and Gibson, 2001: 2). Moreover critical to questions regarding the use of TEK is whether it can be scaled-up into the international arena (Haas, 1992). Keck and Sikkink's (1998) suggest that networks expand the notions of community. They are multi-scalar phenomena, of actors and agents out of which, and against which, individuals and groups align and define themselves. Networks are political spaces where differently situated actors negotiate – formally or informally – social, cultural and political meanings of belonging and often share a centrality of values and principled ideas. Networks, therefore, provide channels of communication through which information can be shared, produced exchanged, and coordinated.

Critical to the success of these networks is whether they match up with already existing traditional networks with communities. For networks to be successful it is likely that their ontology will have to correspond. Networks aiming to coordinate the decentralised and co-managed conservation initiatives have to reconcile their structure with the already existing lines and networks of authority and decision-making of traditional small-scale societies.

Critiques of global conservation

Despite the recent recognition of the role of indigenous communities, and their inclusion into conservation initiatives, there are still many points of contention. Two highly relevant critiques which will speak to my analysis of the FLMMA network are political ecology and environmentality.

Political ecology emerged in academic literature during the 1980s at the confluence of various disciplines including political economy and anthropological ecology (Peet & Watts 1996). The analytical capabilities of these subject areas were considered unsatisfactory in negotiating responses to apolitical discourses. In response to neo-Malthusian and the “tragedy of the commons” narratives, political ecology seeks to describe, in a normative way through empirical explorations, linkages in the condition

and change of social and environmental systems, with explicit consideration to the relations of power-knowledge and politics over critical natural resources (Walker, 2005).

Political ecology focuses on several different research areas such as degradation and marginalisation, environmental conflict, conservation and control, environmental identity and social movement (Robbins, 2004). Political ecology appeals to both the symbolic and material production of nature and the ideas which surround it. Thus political ecology draws on post-structuralist and post-modern discourses in order to unsettle preconceived notions of human-environmental relationships (Darier 1999; Latour 2004; Peet & Watts 1996). As a result it has been significant in breaking down the dichotomies between nature and culture, environment and society and wilderness and civilisation which continue to inform many conservation policies (Biersack & Greenberg 2006). Thus it creates greater understanding of the union of different ideas, philosophies and cultures between western notions of conservation and indigenous ideas of the environment.

Environmentality was first coined by Luke (1995) which built on the influential philosopher Michel Foucault, and his work on governmentality and biopolitics (see Foucault, 1977; 1978; but also Lemke, 2001; Dean, 1991). Governmentality has been articulated succinctly by Foucault (1977) as the ‘conduct of conduct’ and constituted by a triad of sovereignty, discipline and government (Rutherford, 2007), that operate through power-knowledge relationships, institutions, and self-government or technologies of the self (Agrawal, 2005; Lemke, 2001). Thus, environmentality focuses less on the material aspects of environmental management like political ecology. Instead, it explores the potential shifts in the beliefs of indigenous communities in relation to the environment and associated environmental regulation.

This has been most explicitly addressed by Agrawal (2005:164) who combined new institutionalisms with Foucault’s post-structuralist work to ask ‘*when and for what reasons do socially situated actors come to care for, act, and think of their actions in relation to something they define as the environment?*’. In this instance the environment constitutes a ‘conceptual category’ that organises people’s thinking. It can be seen as a

domain in which people consciously perform specific actions. Alterations of the subjective relationships of people with each other and the environmental domain are analysed as part of changing relationships of power and governance (Lemos and Agrawal 2006). Agrawal (2005) does this using a triadic structure exploring shifting relationships between states and localities (governmentalised localities), the development of new regulatory spaces (regulatory communities), and the development of new ways of thinking and acting in relation to the environmental domain being governed (environmental subjectivities).

By focusing on ideas about how actors who are politically and materially motivated engender a conservation ethos, to develop in and among indigenous communities that allows for a better and more rigorous appraisal of the institutions which attempt to facilitate conservation. The way knowledge is produced and used in institutions is critical to the effective management of natural resources. The emergence of these institutions is thus a highly political affair. Whether institutions that emerge will be efficient for society depends on the extent to which the interest groups attempting institutional change intersect or overlap with those of the larger collective (Agrawal, 2003).

New environmental governance

Environmental governance is synonymous with interventions aimed at changes in environment-related incentives, knowledge institutions, decision-making and behaviours. It refers to the 'set of regulatory processes, mechanisms and organisations through which political actors influence environmental actions and outcomes' including the action of communities, businesses and non-governmental organisations (NGOs) as well as the State (Lemos and Agrawal, 2006: 298).

New forms of governance based on participation rather than exclusion are inherently vulnerable to human behaviour which hinders collective benefits. This can be defined broadly as the 'free-rider' problem which describes how rational individuals can produce irrational outcomes as a collective. It has been widely accepted that the fundamental

strategy for avoiding this predicament is the development of robust, self-governing institutions based on a preposition of solving problems by creating systems of governance that enable individuals to sustain long term productive use of natural common pool resources (Cooke and Kothari, 2001; Ostrom, 1990).

Community-based natural resource management (CBNRM) is one such initiative. It seeks to devolve authority and economic incentives to local communities to improve natural resource management and community development. It seeks to integrate TEK and western scientific epistemological worldviews, create environmentally conscious individuals through participation, and align objectives of global conservation targets and local livelihoods.

Predicated on an idea of “co-management” it encourages the appropriate sharing of responsibilities for natural resource management between governments, civic organisations and local communities (Leach et al, 1999). Local level solutions are derived from empowering local communities through devolution of authority from the centre ‘towards the people’ in order to encourage participation in decision-making. Institutional reform based on CBNRM focuses on creating legitimate and enduring community-level organisations for the responsible management of common-pool resources (Virtanen, 2003).

Despite efforts by academics and practitioners to reconcile conservation projects with the needs of indigenous communities, difficulties still prevail. For example, the institutionalised structure of CBNRM is still considered to be too top-down to be properly effective. How does FLMMA fit within the environmental governance framework? Is it able to transcend the shortcomings of traditional conservation models and its modern successor – CBRNM?

Exploring the Fijian Community

A game

It's lunch time. Two children sit in front of me. Smiles brightly lit in the sun. My view is framed by the sea which stretches out behind. I hear the sound of small carriages creaking over rail tracks which carry freshly cut sugar cane. We are playing a game. One person sits cross-legged and is a mangrove. They hide their hands under their knees. The hands are crabs. The other player is a fisher. The fisher tries to grab the crabs. The crab tries to repel them with bites. Eventually the crabs are caught. I am confused at first. The two children laugh. They make me put my arms out in front of me and symbolically cut them off in sections one at a time. They laugh more. When they reach the top of my arms the mangrove has disappeared and the crabs escape in a flurry of tickles. Surprised, I join in the laughter.

Many children's games in Fiji involve the environment. These games, while fun, embody important rituals passed down between generations. The game induces lots of laughter but its actions hold a deeper meaning. It engages children with crab fishing among mangroves, a pastime that will feature prominently for many in later life. The ritual also warns of the dangers of habitat destruction, cutting down mangroves, and the potential adverse affects it can have on their food source. It teaches a lesson in stewardship over their environment. Once the laughter had died down, I ask the girl what the game means. She says that cutting down mangroves will make the crabs go away. The crabs, she says need the mangroves and we need the crabs. She smiles. We both need the mangroves.

The philosophies and beliefs of a community define the nature of their knowledge and their way of knowing. They also shape environmental perception, effecting how people interact and learn to survive within their environment (Nabobo-baba, 2006). Knowledge, wisdom and experience are therefore valuable and relevant for people in developing countries. If sustainable development planning, contemporary development strategies and resource management arrangements are to be successful then they must incorporate an understanding of worldviews, resource management systems, social institutions, and the local empirical knowledge that constitutes indigenous communities (Veitayaki, 2002).

In this chapter I will suggest that rather than simple recognition and incorporation there needs to be a critical understanding of the ontological and epistemological assumptions upon which indigenous knowledge is based. In an environment where state policy, legislation and enforcement is weak and in some cases non-existent, aligning world views between indigenous people and civil society institutions such as FLMMA is likely to engender greater compliance and therefore success of any management intervention (Agrawal, 2005). Both indigenous communities and partners of FLMMA need to understand root assumptions about the world and each other.

Throughout history, indigenous people have survived by making difficult resource management decisions. Over time, a complex and sophisticated knowledge base has developed relating to food sources, farming systems, fishing practices, medicines, social relations and resource management contributing to the ability of communities to sustain their environment (Veitayaki, 2002).

The Fijian worldview is transmitted orally through dance, song, ritual and stories. Because they view everything to be connected, the land and adjoining fishing grounds are associated with spirits that protect them. The environment is not considered separate, but as an integral part of one's self, providing the physical manifestation of the link between the living and the dead (Siwatibau, 1984 cited in Veitayaki, 2002). Because the dead inhabit these areas, fishing is only done when the traditional priest (*bete*) grants

permission or when certain requirements are met. This association with the supernatural ensures fishing grounds are respected and protected at all times.

Religion has a significant effect on peoples' relationship with the environment Rappaport (2008). The Christian god, for example, is embraced in Fiji as part of the realm of traditional gods and spirits (Nabobo-baba, 2006). Kittune Ratuba (Kiti), the head fish warden in the Tavua District, is also of the *matanivanua*¹⁰. He is also a pastor and a religious man. Kiti considers himself to be a 'conservation convert' (SeaWeb, WWW) after he attended the FLMMA workshops in his village and realised the need to act as a steward over the environment. Recounting his previous job as a dynamite fisher, he told me;

"I stopped all this when I came to learn about looking after the environment and it filled my heart and I looked forward with my mind and thought this is the future for tomorrow. I have never looked back...I look forward."

Stewardship over the environment is a concept readily understood in Fiji. While there is no literal translation for conservation, there are several words and phrases which emphasise caring for the environment (Alcorn, 1993). Words such as *mamavoroi* (to look after or protect) are often used in relation to the environment. *Mamavoroi ni yaubula* (to protect ones natural environment) for example, is spoken in relation to *vakayagataka vakayalomatua* (to use your environment sustainably). These are used in Fijian culture in reference to their traditional *tabu*¹¹ areas. These are sacred marine areas where community members cannot fish. Thus, *vatatabu i waitui* is often used and literally means "stop what you are doing in this area."

These cultural worldviews are reinforced with the socio-economic data from the Tavua community. In the 'factors to measure' section of the learning framework, environmental

¹⁰ Herald or spokesman (one who represents a group or chief).

¹¹ No-take marine areas.

attitudes are defined as; ‘local stakeholders feelings towards the natural environment, their social customs or beliefs regarding resource management, and their perceptions as to whether they believe their actions either positively or negatively affect the environment.’ (The locally managed marine area network, 2003:4-47). The Tavua socio-economic data suggests that villagers’ environmental attitudes were moderate to high, otherwise understood as having positive to strongly positive environmental attitudes. These attitudes are clearly based on a Fijian world that is constituted from complex arrangements of physical, metaphysical, and sacred things which cannot be separated from each other. They are understood through a tactile and experiential understanding of their environment which is understood in relation to their actions and the subsequent environmental change.

Local knowledge and the fishing economy

Indigenous commercial and subsistence fishing activities play a pivotal role in the provision of sustenance and income for the rural coastal communities in Fiji. Many people still live hand to mouth. Fish are plentiful and easy to obtain in coastal areas. A person can catch enough fish to feed his family and sell what is left in only a few hours. A well informed academic at USP emphasised that every household had a family member who fished. Fishing, therefore, affects everyone. The rural population that constitutes over 50% of the population, gains an estimated 50% of household income from the marine environment and 75% of their dietary protein, from an average fish consumption of 40 kg/yr to 100kg/yr per head (Aalbersberg *et al* 2005).

The fisheries industry is the fourth largest sector of Fiji’s economy and the third most valuable export industry, with an export value of FJ\$98.4 million in 2001 that contributed 2.7% to the country’s GDP (Gillet and Lightfoot, 2002), the highest GDP per capita of any of the Pacific countries. In 2002, the domestic commercial catch of fresh and frozen finfish was around 6665 tonnes worth FJ\$27.9 million and for non-finfish approximately 4870 tonnes worth FJ\$6.2 million. The main species caught include several inshore finfish species, mangrove crab, prawns, bivalves and beach-de-mer. Fishing provides

employment directly and indirectly to most households. It is estimated that there are 895 fishing boats in the artisanal fishery and 30 commercial charter boats directly employing over 2000 people and supporting employees in municipal markets, processing and mechanical companies.

Most of the fishermen in the Tavua community had been fishing their whole life. Fishing is learnt through experience (Haggan, et al, 2007). Children learn from their fathers and grandfathers whose knowledge is passed down orally. Knowledge about when and where to fish, what gear and methods to use are learnt out on the boat. Fishermen use a variety of techniques, but mostly lines or nets. However, over the last few decades there has been a dramatic increase in fishing pressure. In Tavua one fisherman recounted the change in fish abundance since his childhood;

“At that time there were not many fishermen in Tavua with only a small number of boats, there were plenty of fish. Now, since the increase in fishermen, their use of nets with small holes and dynamite, fish numbers have decreased.”

This fisherman echoed the chief I spoke to who described the dramatic marine degradation since his childhood, highlighting the role new technologies, such as fish finders have had. These are sonar devices which map the ocean floor. Both the fisherman and the chief underlined the difficult choice fishermen face when deciding on appropriate fishing gear to use. Either they use less intensive methods and increase their fishing effort, or use more effective methods but risk damaging the environment and themselves.

Choice of gear type is, however, also dependent on the weather. Good weather means nets can be used whereas bad weather requires the use of lines. Wind is also a major factor. One fisherman described how he would watch the surface of the water and watch the ripples made by the wind. When this happened he would know that the fish would be swimming against the ripples and so he would fish there.

The weather also determines how far fishermen are able to travel out into the *i qoliqoli*. If the weather is fair, fishermen will go out further and stay out longer, sometimes up to three or four days. Fishing is generally done at night by the moon. The moon changes the size of the tides and through a lunar cycle, I was told, the fish bite differently. Fish move with the tides. Most fishermen fish over the low tide because fish tend to congregate in specific areas. Many have a good knowledge of where the fish move to during the subsequent ebb and flood.

Fishermen fish over or near the edge of reefs. Reefs are an oasis in the ocean, abundant with life. They vary in size and shape. Fishermen will fish round them, inside them and over the edge of them down into the ‘drop off’ depending on the type of fish they want to catch. The type of fish varies depending on whether the fisherman is fishing to sell what he catches at the market or if it is for personal consumption. However, I was told by a key informant that many fishermen will take everything they catch.

Fish are sold in the local market. A bundle of fish (usually 5 to 6) will fetch FJ\$5. This is often not practical for fishermen. As such there is a growing number of middlemen who buy fish from fishermen for about FD\$4 which is subsequently sold at market for FJ\$7. While there are inherent losers in this exchange, not least the fishermen and the customers at market, the middlemen are able to store the fish in coolers and save fishermen time and effort.

The practical aspects of fishing tend to govern fishing practises but are informed with knowledge learned from previous generations about specific fishing techniques and locations. The marine environment, for the fishermen I interviewed, is constituted from a range of different elements rarely defined in terms of scientific taxonomies or monitoring techniques. Instead, knowledge is constituted relationally through experience. At face value these methods seem ad hoc, but through time can form into highly accurate and robust knowledge bases.

Social institutions and resource management systems

The customary marine tenure systems (CMT) which in Fiji are known as *i qoliqoli* areas, or traditional fishing grounds, are under the control of local communities. There are currently 385 marine and 25 freshwater *i qoliqolis* in Fiji that cover the foreshores as well as the main rivers, smaller rivers, creeks, ponds, or lakes of the main islands. They originated from a host of cultural, historical, geographical, biological, legal and technical components and were traditionally based on oral claims from different, but closely related, social groups (*vanua* and *yavusa*) that regulate its use and exploitation.

Social groupings in Fiji are divided according to the *vanua*¹², otherwise known as a tribe; the *yavusa*¹³, which constitutes a clan. Within villages, the *yavusa* is divided according to *mataqali* (sub-clan) and *tokatoka* (extended family) which are subdivisions of naturally increasing families; and lastly *vuvale*, which are individual households. The rights to fish are controlled by a preordained clan, chief or family. The close-knit family units and hierarchical structure of the Fijian community creates a taboo system which demands that people strictly follow tradition and respect each other (see Berkes, 2008). The final decision of the group lies with the chief who commands authority and respect. The following is an extract from my field notes that describes my arrival in the village and my meeting with the community chief.

On arrival I was led by Kiti, the head fish warden to take *sevusevu* with the chief. While walking, Kiti instructed me on matters of conduct. Inside, Kiti said a few words of introduction and I was told to sit. Beside me were a group of elderly men sitting cross legged around a very large *tanoa* bowl. I had brought with me a gift, according to custom, of *yaqona*. The Chief sat apart at the front of the room. A number of prayers were said and I shook the chief's hand before taking *kava*. I was told later that the distribution of kava symbolised the lines of authority among the group. Kava went to the chief first. Kiti told me;

¹² The largest social grouping including all members belonging to a living soul, or the human manifestation of the physical environment.

¹³ People are divided according to blood and other kinship ties.

“in Fijian culture when you give the yaqona bowl to the chief you are actually giving him the whole territory, including the land and the sea and the coconut tree, the bird in the air, everything in the Tavua area.”

Authority to make decisions and enforce rules within communities is situated within the confluence of a diverse and dynamic socio-political structure. Indigenous communities traditionally have a strong culture of communalism, where the community has a sacred order. Individuals are not motivated by a personal greed but instead think in terms of ‘keeping the community’ on the path ordained by ancestral spirits. This is reinforced through ceremonial rituals that emphasise how individuals are embedded within their community (Brison, 2007).

Decisions made by the group are often conveyed through social channels of communication (Veitayaki, 2002). In the community the herald clan or *matanivanua* disseminates the word of the chief through the community. Once a week in Tavua, the chief’s decrees can be heard broadcast over the village on a load hauler. Dissemination is also made through the different groups. In Tavua there is a youth group, a women’s group and a church group. Every group has a leader who is able to inform the group of any decisions made.

Traditional practises are also embedded within management structures of the marine environment, with communal harvests and *tabu* areas which are collectively managed and reinforced by the community (Johannes, 1981). Traditional management of the *i qoliqoli* includes temporary closures of these fishing zones, limitations on the number of fishers or the amount of fish they could harvest, restrictions on using certain fishing practices and the imposition of a *tabu*, or prohibition on fishing for certain species and temporary moratoria on fishing.

Commercial fishers operating within the customary fishing areas in Fiji are required by law to have a license which is renewable every year. The licenses are non-transferable, and are issued by the Fisheries Division on receipt of approval from the head chief.

Licensing is presently the most widely used fisheries resources management measure used in the inshore areas.

These rules are reinforced by the fish wardens who enjoy official recognition from the state, recognised in the 1941 Fisheries Act. In Tavua, Kiti has developed a team of fish wardens dubbed the, 'Navy Seals'. They are trained by the fisheries department and are licensed to detain poachers and issue fines. Local law enforcement within the community can be enforced through physical punishment. I heard several cases where poachers had been beaten.

Threats to the Marine environment

There have been a series of complex socio-economic and political changes in Fiji over the last century all posing an increasing threat to Fiji's biodiversity. The threats are extensive and have been documented by WWF (2003) and Fong (2006). These factors constitute some of the potential threats to successful conservation within small-scale societies outlined by Smith and Wishnie (2000). Threats, however, are dependent on a multiplicity of perspectives and a number of differing factors where each community is faced with problems which may be particular to that area (Wells, 1992). In Tavua, specific threats include; dynamite fishing, mines, flushing cyanide and chemicals into the rivers, excessive land clearing from slash and burn techniques and the resultant soil erosion which creates turbid water, and other destructive fishing methods.

Thus, risks and threats are constructed through experience. In Tavua I met Lukecala, an ex-dynamite fisher. Dynamite had blown off his hands and left him permanently blind. He told me that he had understood the dangers of dynamite fishing but was enticed by the easy returns for his work. Dynamite could reduce his fishing effort from 5 to 6 hours to only 1 or 2. He claimed that it was the fall in fish prices that enticed him to get more to support his family. Lukecala is very independent and still works looking after cows for a living. He is not marginalised, but rather used as an example to warn other people of the dangers of dynamite fishing. Other risks are less prevalent, particularly intangible risks

such as climate change. When I asked fishermen about it they said that there was no talk of that in the village. One claimed that, *'people do not understand these things.'* Another group of fishermen described weather changes and the impact on the amount of fish caught but that, *'they don't know why.'*

Government involvement in marine management

Under the Ministry of Fisheries and Forests Strategic Development Plan 2005-2007 (2003:3), the objectives of the Department of Fisheries are to promote marine biodiversity through better conservation and management of resources but also to explore market access and opportunities for products developed from resources targeting the retail end of the market chain and creating employment in rural areas through resource development, whilst improving food security (Fong, 2006). Despite these aspirational goals, government involvement in fisheries management has been weak. In Tavua I was told that;

'The fisheries departments help with enforcement but don't have any money so only come on patrol with the Tavua Navy Seals, and only in the daytime because they work from eight until four. This limits their effectiveness.'

There have been a series of government policy and legislative documents on fishing in recent times. The first of these was the 1941 Fisheries Act. Much of this law is still binding today, but is archaic and no longer appropriate to modern day Fiji. A key informant highlighted that the law still allows anyone to fish anywhere with certain fishing gears which goes completely against the community rules. Moreover the penalty for illegal fishing in Fiji is only FD\$50. The informant suggested that this needs to be at least FD\$50,000 to have any effect. As a result many of the poachers brought to the police are let go because the cost of prosecution is not justified by the fine. As a result no one has ever been prosecuted for poaching.

Most of the marine and fishing laws¹⁴ are drafted in departments organised around extraction and economic development and as a result have been found wanting. Furthermore, since the 2006 governmental coup, which abolished the constitution, their effects have been weak. In recent years there have been many development programmes which have attempted to fill this void. Among them the FLMMA network works to negotiate international targets on development and conservation with the needs of communities.

¹⁴ The 1941 Fishing Act was intended to protect local fishing rights and saw the creation of the licensing system and restriction of certain fishing practices. The Marine Spaces Act (1977) is responsible for management of fisheries within Fiji's economic exclusion zone (EEZ), and the Fisheries Regulations (1965) which prohibits certain areas and destructive fishing methods. The Environmental Management Act (2005), which is the latest legislation to be passed in Fiji, looks at environmental management and sustainable development in a more holistic manner.

Assumptions of the FLMMA Network

An interview

On Mafu Street in central Suva there is a line of large houses which have been converted into offices. These house a number of international NGOs and intergovernmental organisations. Sitting in one of them, a director is describing to me how the successful implementation of a management intervention is dependent on the negotiation of internal barriers. *'There has been huge pressure'*, she says, *'from the church conference gatherings to harvest fish which often results in over exploitation of fish resources.'* This also happens when communities open their *tabu* areas following the death of a local chief or when the community is trying to raise money. *'They took the amount they needed...on the first day but were getting so much money that they kept it open for five weeks and made about, we estimate, over two hundred thousand dollars on the amount of fish {they} sold.'*

Today, Fijian communities manage their resources with external parties. This partnership should ideally service the community's needs whilst progressing the NGOs' objectives for conservation. It is often the case however, that the relationship is uncomfortable. More often than not the partner organisation has more power in terms of finances and resources which effect the stability of the relationship. One interviewee confided in me that, *'protected areas are being passed around as if they belong to the conservation organisations.'*

Development of FLMMA

The FLMMA network developed out of the community-based natural resource management initiatives and a lack of governance in the marine environment. Understanding its historical background can help us to understand the ontological, epistemological and pragmatic assumptions upon which it is based. How the network is conceptualised and manifest in practise by those who developed it is important when comparing it with existing networks in indigenous communities. This chapter will explore the development of FLMMA and its preconceived assumptions. The following information has been generated from key informant interviews and FLMMA documents.

The FLMMA network was born out of a pre-existing project known as the Biodiversity conservation network (BCN), an element of the Biodiversity Support Programme (BSP) initiated in the early 1990s. It used enterprise tools for biodiversity conservation in 39 sites worldwide and sought to determine whether natural resource products or bio-prospecting initiatives could foster conservation among communities by demonstrating its potential financial benefits. The principle environmental officer in the Fijian environment department at that time, Sefanaia Nawandra, nominated his community, Ucunivanua Village in Verata district, to conduct the trial.

This project allowed academics at USP and others at the Packard and MacArthur Foundation to generate environmental awareness and experiment with a new participatory methodology in conservation planning. When funding for the BCN projects ended in 2000, donors from the World Resources Institute (WRI), and Packard and MacArthur Foundations, saw the potential for this new model to be scaled-up across the Pacific.

The practitioners of the BCN projects were persuaded to come together by Foundations of Success (FOS), a private environmental consultancy, who realised that any comparative analysis across the different projects was limited because each project operated independently and subsequently implemented and monitored their sites

differently. It was agreed that an umbrella network would facilitate government and community engagement and align their needs and objectives with their activities. Attention was focused on the South Pacific specifically because of the no-take zones that were introduced during the BCN projects.

In August 2000, a meeting called 'fish for the future' saw 40 representatives from 10 South Pacific-based projects convene in Suva to discuss how partnering conservation groups with local communities to establish and manage 'marine protected areas' might work in practice. The practitioners present at the meeting envisioned a sharing of information, collected using similar methodologies, between projects supported by partner organisations (LMMA, 2003).

Cross-site comparison was to be based on a Locally-Managed Marine Areas (LMMA) strategy used by all project representatives at their project sites (Locally-managed marine areas network, 2003). The aim was to improve resilience and the capacity of communities in the adaptive management of critical, natural resources (LMMA, 2004) to produce self-sufficient communities able to enact their own management interventions within the *i qoliqoli*'s and a group of practitioners to amalgamate, interpret and coordinate data across the network.

The FLMMA network can therefore be defined as a collection of projects and practitioners that use the same strategy to achieve common goals; 1) to implement more effective projects; 2) to systematically learn about the conditions under which this strategy works best and why; and 3) to improve the capacity of network members to use adaptive management as an approach to improving project outcomes. Adaptive management is a learning approach focused on improving policy and practice in the face of uncertainty. This is often prescribed as a tool to frame the philosophical, methodological, and practical challenges associated with the management of natural resources. Management strategies and policies are considered experiments and learning is encouraged through both structured experimentation and management flexibility (Armitage et al, 2007).

Ontological and epistemological aspects of FLMMA: The Learning Framework

Probably the most revolutionary thing to come out of the FLMMA network has been its development and use of the Learning Framework (LF). The LF is a new paradigm on the way conservation strategies can be undertaken. It has developed a common language with which to streamline conservation initiatives across the network. As such, the LF formally details in advance how strategies, their underlying assumptions and the information needed to enact them, will be attained. The ontological and epistemological assumptions about the world and how it should be understood are agreed *a priori* to the start of projects. It defines what is out there in the world, what knowledge it is possible to collect and represent and how this should be reconciled with pragmatic decision-making within communities. Thus the FLMMA network through the implementation of the LF projects its own ontology, epistemology and pragmatics upon Fijian communities.

The LF constitutes a basic planning tool for the FLMMA network. It describes typical conditions at sites where projects are being implemented, the types of LMMA strategies that are being used and assumptions about how using certain strategies will change prevailing conditions, as well as determining what information is needed to collect and test these assumptions. To do this the LF has developed a conceptual model. This model is, '*shows the relationships between certain factors that are believed to impact or affect one another*' (Parks and Salafsky, 2001). It provides an outline of the progression of causal factors and relationships that lead to environmental degradation and the tools that can be applied to solve these problems.

The constituent parts of this model include; a target, direct and indirect threats, strategies and assumptions about how each of these factors impact upon each other. The principle target is the health of the marine environment, which, it is assumed, benefits human well-being. Threats are linked to human activities and not natural processes. Strategies and tools include, for example, a full reserve, a species-specific harvest refugia and behavioural restrictions.

Implicit in this model is the removal of people from the LMMA area. This is evident in the assumptions made about the effect of management intervention – that it will lead to improved marine environmental health and enhanced resource yields (Leach and Mearns, 1996; Brockington, 2002) The LMMA is considered to be a ‘safe haven’ serving as a sanctuary for biodiversity allowing for ‘seeding’ of eggs and larvae, ‘spill-over,’ and ‘successional yield.’ where it is implicit that fishing pressure must be reduced.

The LMMA is defined by the habitats and resources present in an area as well as any adjacent community whose members use or impact on resources. Defining the area is done through hand-held global positioning systems (GPS) or simple mapping techniques. This delineates the overall marine area the community utilises and the location and size of specific habitat types, the political jurisdictions and traditional tenure boundaries, fishing and marine resource use areas, and other physical and oceanographic boundaries.

Initial biological and socio-economic assessments are carried out by partner organisations according to simple scientific methodologies. The LF outlines over 30 factors that subdivide around the conceptual model. It assumes that to understand the environment we need to collect and record data based on predefined assumptions about it. The methods used are described as ‘simple monitoring methods’ using ‘basic ideas of sampling and statistics.’

The FLMMA network engages communities through a series of three workshops; management and action planning, biological monitoring, and socio-economic monitoring. The workshops serve a dual purpose, of exploring and identifying resource management issues and developing confidence within the community to tackle issues in their marine environment. These are followed by a focus that identifies resource use, threats and root causes of environmental degradation with the aim of producing a community management action plan and training in scientific data collection methodologies, the objective being to enable communities to collect data themselves thereby encouraging engagement and participation. Importantly, the community doesn’t process the data. It is

sent to partner organisations that analyse and interpret it and subsequently present it back to the community.

Unfortunately, the ideals espoused by the LF are often unattainable in practise. Different partner organisations maintain their sovereignty by implementing projects in their own style and on their own terms (Igoe, 2004). Similarly, community engagement is not always commonly understood and that affects the level and type of participatory strategies implemented (Agrawal and Gibson, 2001). This makes cross-site comparison challenging.

This diversity has created tension despite being devised to promote unity. From the outset, there were disagreements among the practitioners of the partner organisations on the primary objective of the network - conservation or community-development. Initially, there were some among the practitioners who saw the network as a framework through which to employ conservation tools (such as MPAs), monitor success and devise adaptive management strategies.

This led a key informant, a self confessed 'community development person,' to suggest that it would be very difficult to, '*get a community involved by conserving something that is of no importance to them*' and rather, '*any conservation that involves communities has to meet community needs first*'. While '*some de facto conservation objectives will be met*', the most important thing is, '*just having the community organised and feeling good about what they are doing,*' which will ultimately make them more receptive to conservation interventions in the future.

Whilst the FLMMA network is useful for the partner organisations, many of which are pursuing conservation objectives, it does not necessarily equip communities themselves to deal with environmental degradation and resource depletion. Moreover, the FLMMA network is predicated on ontological and epistemological assumptions that reflect a scientific worldview and not that of the indigenous communities (Fairhead and Leach,

2003). This, as we will see, has a significant effect on the future success of the projects in the FLMMA network.

Event Ecology

An event

In the community of Tavua, the head fish warden issues licences and fines locals who break the agreed fishing rules. In 2008, an increasing number of fishermen voiced concerns about the head fish warden, Kittune Ratuba (Kiti). They believed he made too much money from the issuing of licences and fines. This money, Kiti told me, was used to provide food and fuel for the fish wardens. This opposition mobilised and went to the chief. As an avid supporter of conservation issues, the chief backed Kiti, offering to provide anything he needed to ensure the continued protection of the *i qoliqoli*.

The death of the chief in January 2009 presented an opportunity for the opposition group to rally support within the community and challenge Kiti's authority as the head fish warden. Kiti was unceremoniously sacked at the next community meeting. In his recounting of this story to me, Kiti got angry. He clenched his fist and growled; "*In Fiji today, if something come good. They try to break it!*" Kiti was taken to the police station and locked up. He was eventually released after four days.

Kiti proudly described how this group of people were unable to defeat him. Now Kiti works with the new chief. There are those who still oppose him. Kiti, however, says he doesn't want enemies. He tells these people; '*if we are going to protect the MPA and the i qoliqoli we need to come together and work together*'.

Kiti's story is an example of the unpredictable events that can undermine natural resource management. Many communities have multiple and diverse views which differ across the social strata. It encapsulates the dangers of conceptualising small-scale societies as a homogenous social unit. The long-term sustainability of management interventions are dependent on a whole range of unforeseen events, which are both hard to predict and hard to negotiate.

In Fiji the FLMMA network sits within a well established indigenous society. It has its own complex social, political and economic structures based on specific ontological and epistemological understandings and pragmatic institutions through which difficult resource management decisions are made. It also operates within a global conservation arena with its own discourses and received wisdoms that inform national and international targets, civil society and the funding structures that underpin them (Leach and Mearns, 1996; Igoe, 2004). The FLMMA network is a cross-scale network operating at the local, regional, national and international level (Keck and Sikkink, 1998). It is constituted from a plethora of actors and stakeholders each with their own prerogative and agenda (Robbins, 2004). Each is influenced by their individual worldview and pragmatic contexts. For FLMMA, negotiating these multiple factors is an unprecedented challenge.

It is widely considered, and was told to me by a key informant, that FLMMA's crowning achievement was, '*mapping the process of engaging the community and process of working with communities.*' Despite this, there are still elements that threaten the network and its longevity. These pressures are based, fundamentally, on the conception of the community. As outlined in chapter three and four there is a significant mismatch between the ontological, epistemological and pragmatic assumptions under which the community and the partner organisations operate. Moreover, the community is not and cannot be defined as a homogenous whole (Agrawal and Gibson, 2001). This chapter will describe, with reference to the Tavua community, some of these problems and explore the success and failures the FLMMA network faces and is likely to face in the future in relation to three critical factors; pragmatics, epistemology and ontology.

Pragmatics and epistemology

The Tavua community is one of the FLMMA success stories. The community chief, Ratu Ovini Bokini, was also Fiji's Fisheries' Minister. He heard about the success of the first project run in the early 1990s and wanted to repeat the success in his own community. He had previously attempted to implement a MPA, but failed because it was too top-down

and the population did not accept it. He therefore wanted to use the bottom-up participatory approach of the LF. The LMMA was subsequently established in 2002 and as a result, the first workshop to be hosted by FLMMA, through IAS, was established. At a Management Planning workshop in 2002, the following vision was outlined;

‘To have permanent closure of the waters surrounding the small island of Manava, which is enclosed by the Nasalisali reef. This is to ensure that future generations of the Tikina Tavua will have fish and other edible marine resources to eat.’ (LMMA site report, 2008).

Following the workshop, the closure of the MPA around Manava Island and the Nasalisali reef was declared. Along with the no-take area the use of dynamite fishing, illegal fishing net sizes and cyanide fishing was banned. The blessings of the chief and the people were bestowed upon the project. A key success of the FLMMA initiative was how it had reconciled the development of LMMAs and management plans with the already existing community lines and networks of authority, specifically engaging the chief and other representative groups within the community. When developing FLMMA initiatives, one key informant suggested that, *‘getting the support of the chief is critical’*. FLMMA has also based new institutional structures on preexisting authority lines within the community. This included the i qoliqoli committee whose structure was similar the community groups (youth, women and church), enabling dissemination of management decisions and facilitating participation and communication.

Other reasons for FLMMA’s success in the Tavua community can be attributed to a series of unforeseeable factors and events. The head fish warden, Kiti, for example was a farsighted and ambitious individual, who, with the consent of the chief, established the ‘Navy Seals’, a dedicated group of individuals who volunteered to protect the management intervention. Kiti also played a crucial role in the development of the management plan and his research into the Fisheries Act allowed him to identify that he had the autonomy and authority to impose fines on poachers. Kiti told me;

‘I compared the Fisheries Act (1941) to our management plan. I looked to see what would work in our village and I saw that putting a charge would be the best way to deal with the problems.’

Leadership from Kiti was made possible by the hierarchical structure of the community and the power devolved to him from the chief. This enabled Kiti to enact rules that the community followed in allegiance to the chief. By providing the framework, the FLMMA network has infiltrated and engaged with the community networks through which the pragmatics of decision making flows (Keck and Sikkink, 1998).

The FLMMA network has also reconciled indigenous and scientific epistemological understandings of the environment. This is evident in the biological monitoring workshops that train and equip local people to monitor their own environment. Rather than conceptualise TEK and scientific knowledge as situated at the opposite ends of a spectrum, the network has blurred the distinction between knowledge as object and knowledge as process allowing the two to be combined. Breaking down science into its simple constituent methodological parts and rendering it applicable to indigenous cultures has allowed for a co-production of knowledge. By providing the tools with which to amalgamate TEK with scientific knowledge, indigenous communities are able to address environmental problems in an adaptive capacity. Thus, scientific methods have been applied to indigenous epistemological ways of knowing the world.

This seemingly neat process, however, is threatened by several factors. Many of the people who are trained by the FLMMA network in the biological monitoring techniques are not actually fishermen and so may not hold any relevant ecological knowledge. Instead, participants often do not have any critical TEK and do not engage directly with the marine environment.

Another threat to the potential for combining epistemological assumptions and worldviews is that much traditional ecological knowledge is disappearing. One key

informant, when discussing the erosion of traditions, suggested that, '*traditions are from a time in the past.*' Another recounted a story his grandmother had told him:

In the Bua district every year there would be the arrival of a sacred fish in the river adjacent to the village which only women would be allowed to harvest. At a specific time some of the women would enter the water and search for the fish while others would stand on the bank and recite chants calling the fish to them. When the fish were found everyone would chant in unison to the spirits before the fish were harvested. The arrival of this fish was said to be conditional that the village did not distribute it to neighboring villages. This ritual however receded and the fish lost its sacred place among the villagers and began to be distributed more widely. Today the fish does not arrive back and has not been seen for a long time. The young people of the village no longer remember the ritual or the chants that go with it. The elders blame the enticements of modern life that are now creeping into the district.

Despite this apparent erosion of TEK, attempts to reconcile epistemological understandings would still seem prudent. This is because international conservation NGOs and the network more generally have equipped themselves to, on the one hand, combine TEK with scientific monitoring methods allowing for the generation of accurate and comparable data, and on the other, create a framework which is cogent with international conservation targets. In a discussion with a key informant about FLMMA's response to global conservation targets I was told that, '*our goals and objectives are broad enough to deliver.*' There is, however, disagreement among the partner organisations on this issue. Another told me on the same subject, '*No! We just stick two fingers up to that and get on with our own thing. One of the problems in FLMMA is that some partner organisations operating here are controlled by mother ships and they can't stick two fingers up at it.*'

The distinction between the FLMMA networks principle objective as either a conservation model or a livelihood's model is split among the partner organisations. The LF has defined its primary objectives in the following way;

'If health is maintained or improved, then human well-being will be maintained or improved. The LMMA Network is choosing to focus on factors of human well-being linked to marine environment health. While human well-being may be considered the ultimate goal, marine environment health is the primary conservation target that participating projects are focused on improving. For the purpose of this framework, we will only focus on the ways in which an LMMA strategy affects marine environment health. We will not be considering other factors that might affect human well-being.'

There is clearly ambiguity here as to what the principle aims and objectives of the FLMMA network are. This has left its precise meaning open to interpretation, which is something that is exploited by all of the partner organisations. This inability to agree and prioritise on a cogent vision of the network begs the question as to whether communities are able to properly understand the network's purpose and aims and not to inhibit their correlation.

This is reinforced by the partner organisations that have markedly different epistemological understandings of the world, independent of the LF and indigenous communities (Luke, 1995). While all accept the importance of local knowledge, many often only employ it in the development of management plans as a tool for achieving their own ends. Often the furthest extent to which TEK is collected and engaged is through resource mapping with local fishers asking them to depict graphically, harvest sites using maps. Opinions about resource abundance are also collected, but are not considered robust unless they are validated with scientific monitoring techniques. A director of an NGO suggested;

“People perceived that things were going downhill in 2005 but in 2008 people thought that everything was going well. The categories defined [in the survey] included; live coral abundance, fish abundance, fish size and fish diversity. In all cases the vast majority [of people] thought that there were increases in all of these categories...This needs to be matched up to biological reality.”

This worldview situates science at the top of a hierarchy of knowledge demoting TEK to ad hoc and anecdotal (Agrawal, 1995). While this view does not represent the view of all FLMMA partners, science and scientific methods take pride of place in both the design and implementation of the management interventions.

How epistemological understandings about the world are viewed by partner organisations will affect the implementation strategy in communities and the potential success or failure of these projects in the eyes of the community and the partner organisations that often have different opinions on what constitutes success. This difference runs even deeper among the partners. One NGO director, when asked if there had been any crisis events at their sites, replied, *‘there have been disasters from our perspective but not from their perspective.’* Similarly another manager from a regional NGO said;

‘What is a problem with us may not be a problem with the community. For me, I am trying to acquit a project which for me is a problem, but for the community it is not a problem. The challenge is making sense of what is in the communities mind and asking what you are really leaving behind. I can go into a community and complete a project and tick it off as a success but in the communities it is a total flop because you didn’t meet certain criteria they were expecting.’

These issues illustrate the threats of global scale conservation initiatives on the FLMMA network. There are clear power-knowledge relationships at play here (Agrawal, 2005). I was told that many partner organisations, *‘prescribe conservation’* as a solution to

community problems, when in fact there may be other issues responsible (Leach and Mearns, 1996). A NGO director who had recently left the FLMMA network highlighted this point, claiming that the network did not always address the needs of the communities. Power-knowledge relationships are also evident in the decision-making structures of the FLMMA network. While the community has the voting rights at the higher level, the partner organisations often put forward motions and act as powerful lobbyists imposing their global narratives of conservation upon communities and pressuring them to vote their way.

The death of the chief in the Tavua community undermined much of the work FLMMA had done and threatened to undo much of the pragmatic success they had achieved. The management interventions were severely put at risk because there was effectively no rule of law. This period of political instability was an opportunity for other chiefs to gain political power and make new community rules. These chiefs saw it as the moment to get rid of the management intervention with the support of others in the village that were unhappy about it. The events in the Tavua community have been repeated around Fiji and it is a common feature in many coastal communities where an MPA has been implemented. Also, after one or two years community members become disappointed that there is only an increase in fish abundance inside the MPA and no ‘spill over’ into the surrounding areas. A key informant said;

‘One of the issues for communities is you usually have to wait five to ten years to see spill over benefits from MPAs. This is a bitter pill to swallow for some communities. One of FLMMA’s potential miscalculations is not being completely open and realistic about how long the benefits will take. One of the consequences therefore is that communities often reopen the area and take it back to stage one.’

In the Tavua community, a fisherman told me that there were many fish in the Manava reef and that he would be able to catch lots of fish if he was only able to go there. Many people in the Tavua village were unhappy about the MPA, the closing of the Manava reef

and the privileged role Kiti was given by the chief to manage the area that ultimately resulted in the events described above.

Failures in the community; the importance of ontology

Threats to the long-term sustainability of the FLMMA network include; its fundamental ontological assumptions of the community and the marine environment. Community participation, that is participation within FLMMA workshops, is based on a preliminary stakeholder analysis outlined in the LF where key individuals and groups are identified. Stakeholders are defined as, *'People who impact or influence the overall marine managed area,'* but are identified through a series of arbitrary or subjective decisions with key informants and site maps within the indigenous community (LMMA network, 2003:3-1). This has led to a failure of accurate community representation especially across gender, age and racial lines. It is a predominantly matriarchal society. This extract from a key informant, describing the inclusion of men and women in meetings, highlights some of the issues and tensions that this can cause (MacCormack and Strathern, 1980);

A woman in a meeting asks the men, 'do you engage women in this management planning, this FLMMA work?' A man said, 'we engage the women they are the ones who prepare the tea and the lunches for us.' The woman replied, 'is that all that we are good for, just serving tea and cooking lunches? Do you know where we are getting the lunch and the dinner from, we go out and fish. We are more involved in the fishing than some of the men and yet we are not involved in the process.'

There has also been a failure to ensure proper dissemination of knowledge. Although the community structures have facilitated the distribution of decisions made by the chief to the community, there is a distinct failure to ensure that people who attend workshops disseminate what was discussed and decided. A key informant told me that;

‘In Fiji a system of representation is still evolving. FLMMA works on the assumption that people that represent communities go back and relay all the things they have learnt, but it hardly ever happens. [There are] still a number of people [within communities] who do not know the management and do not know where the LMMA area is.’

Moreover the structures that have been utilised are designed to facilitate the flow of information from the top-down. Thus, the transfer of knowledge and opinions from the bottom-up by community members to the chief is ineffective. The head of the youth group in Tavua told me, *‘we do not have democracy here.’* Whereas pragmatic issues of tapping into community structures has useful advantages it could also inhibit participation from the least powerful within the community. Unless there is a continued monitoring or assessment by FLMMA to identify the disparate and dynamic interests and changing power dynamics present within communities, the community will continue to be dealt with as a unified homogenous totality.

The FLMMA approach has also been unable to reconcile the ontological characteristics of the community with the marine environment. In the LF, the sites are defined as, *‘the overall marine area being used and actively managed by local stakeholders.’* (LMMA network, 2003:3-2). In this instance, the management intervention is defined according to a unit area, a discrete bounded site that needs to be monitored and controlled. This does not, however, fit comfortably with the ontological structure of the community. The community is not a single entity. If an area is defined and closed by those at the workshops and agreed by the chief, this does not mean the community agrees or will abide by it (Agrawal and Gibson, 2001). This has proven to be the case in Tavua where many people within the community are known to poach from the MPA. A director of an NGO described the situation in her managed area;

‘And then we asked people about poaching. This is a major issue for them. 83% said that there were poachers. The reason they are there is

because you actually can't see them from any of these villages. It is therefore mostly a poaching story about why it's not working.'

On this basis, does the community with its own rights, rules, regulations and traditions that constitute its ontological components (community groups etc) provide the capacity to design, implement, monitor and enforce this management intervention? This sort of question must be addressed if the management interventions are to be sustainable in the long term. If they are not then what else is needed to ensure that effective management is realised? These issues require the FLMMA network to (re)assess its basic ontological assumptions about the community. What are, for example, the basic building blocks that make up the community? Who is inside and who is outside the community? How can those who fall outside be included?

The FLMMA model conceptualises the community as separate from larger socio-political and economic forces. In the Tavua community there is a rapidly rising market economy in fishing which has been partly stimulated by modernisation, its associated culture of individualism and technological advances (Zerner, 2000). These pressures have changed the way fishing works in the community. Today subsistence hand to mouth living runs in parallel with a fishing economy changing the social and political structure of communities (Wilk, 2006). Most of the community groups are involved in economic, as well as social activities, such as farming and fishing. Even the chief of the community told me that they are changing the structure of their community to incorporate business ventures to compete with wider economic forces. Activities such as fishing and farming are therefore an economic investment as well as a social capital investment. The middlemen who are key to this new economy act as critical players within these communities and it would therefore seem prudent to include them within the decision making process.

The FLMMA network has had some success. It has integrated the community with its objectives by aligning its workshops and decision-making processes with pre-existing lines of traditional authority and community networks. It has also reconciled its

worldview with that of the communities by making its objectives broad and its techniques simple and understandable. These positive aspects, however, mask some of the underlying and emerging difficulties. Many of the traditional community structures actually inhibit representation, engagement and the flow of information from the bottom-up and the worldview of the communities and partner organisations do not always coincide. Moreover, the FLMMA network has misplaced the ontological assumptions about the community that works against the empowerment of the community in relation to other partner organisations and this ultimately affects the ability of the community to manage their own resources effectively.

Conclusion

A silent voice

It is late in the evening in the Tavua district, Fiji. We are sitting around a Tanoa bowl and kava is being distributed around a small group of fishermen. These men are Other. As first and second generation Indo-Fijian they do not belong to the Tavua community. Some of these men have lived in the district for over forty years and many were born there. They have been fishing the waters with their fathers since they were children. Their knowledge of i qoliqoli is unmatched. They offered me detailed information about where to fish, at what times and using what equipment. These men and their families depend on fishing for their livelihood and income. Their voices are not heard at village meetings. Their voices are not heard at FLMMA workshops. Their voices are not heard because they are not part of the community in which FLMMA operates and their knowledge and opinions go unregistered.

Efforts to protect the marine environment have reached a critical mass. With many of the world's fish stocks on the verge of collapse, the creation of successful and sustainable conservation initiatives is now imperative. Conservation involves mediating the relationship between people and their environment. It is often indigenous communities who live in the regions of the world most abundant in biodiversity that are most adversely affected by conservation initiatives. The potential contribution by indigenous people to the success of conservation projects is only recently being recognised. This contribution is often, however, frustrated by the differences in the ontological and epistemological worldview between and across different societies and their representatives. Conservation programmes are now attempting to establish a broader view and to enhance the role of local people in specific areas and to utilise and value their traditional ecological knowledge, their interests and their social and economic needs.

Initiatives such as the FLMMA network represent a direct response to globalisation of information and resources, the liberalisation of financial capital, the decentralisation of power from the state to 'the people'. The network approach represents a new paradigm on how conservation strategies are undertaken. By developing a common language through the learning framework that formally details in advance how strategies, their underlying assumptions and the information needed to enact them is to be achieved, conservation initiatives across the network are streamlined.

Whilst coordination of these factors increases the efficiency of conservation initiatives, the assumptions which underlie the network can actually work to undermine its effectiveness. With reference to the political ecology and environmentality literature we are able to better understand how underlying political interests impact upon communities and their perceptions of, and their relations with, the environment. This crystallises the conceptual failures of conservation efforts which can broadly be categorised according to three critical factors; ontology, epistemology and pragmatics.

The FLMMA networks ontological characterisation of the indigenous Fijian community as a discrete and cohesive unit does not take account of the multiple and diverse socio-

economic and political interests that constitute it. The network has so far been blind to this issue. It is clear that engagement within the community based on the traditional hierarchical structures can be tenuous because it does not capture the conflicts that arise within it. This leads to the sustainability of management interventions being vulnerable to a variety of localised socio-political factors, which are often hard to predict.

The epistemological worldviews of the FLMMA network and the indigenous communities with which it engages are fundamentally different. On the one hand, FLMMA draws on western science, characterised in the Learning Framework, which emphasises the Cartesian division between humans and nature where humans are dominant. It relies on abstract and analytical representations of the world, constructed through systematic, objective and analytical research. On the other, the Fijian communities and their knowledge about the environment are integrated intimately with the lives of the people that make up that community and has a direct correlation with the practises embedded within it (hunting, fishing, agriculture). Their knowledge is constituted by pragmatic and traditional methods that have developed across generations and specific to their spatial context.

We can see that the effects of (mis)conceptualising epistemological understandings of the Fijian worldview and the ontology of the basic components of the Fijian community has had significant and detrimental pragmatic consequences. The traditional hierarchies within the local communities have been useful for FLMMA in gaining access, establishing trust and making progress with conservation projects. The imposition of FLMMA infrastructures only really allows for the transmission of knowledge downward. This is fundamentally counterintuitive to the aims of FLMMA and it hinders the ability of the network to respond to socio-economic and environmental change in a fluid and adaptive way.

We need to continue to develop an understanding about how all of the stakeholders that are involved in the FLMMA network engage with and understand each other, to consider

whose voice has been left out and on what basis so that the model can be adapted and improved for the benefit of long-term sustainable conservation in Fiji.

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Appendix A

Masters dissertation research consent form

July 2009

Dear Participant,

You are invited to participate in a study, entitled “Divergent paths: the political ecology of community conservation in locally managed marine reserves, Fiji.” The project involves a researcher from The School of Geography and the Environment at Oxford University (Tom Leveridge) in collaboration with the FLMMA network.

The aim of the study is to analysis the extent to which the FLMMA network facilitates the co-production of knowledge both indigenous and scientific. Using historical records, semi-structured interviews, and participant observation, I will: 1) develop a in depth historical account of the development of the FLMMA network; 2) conceptualise the FLMMA network as a conservation model exploring the conditions under which it allows conservation to develop and the extent to which the network allows for the co-production of knowledge both local and scientific; 3) Determine the threats to the success of this model specifically highlighting the causes of these threats

The results of this study will be used for my master’s dissertation and potentially for the FLMMA network. The results will be shared with participating local communities, FLMMA network members, relevant stakeholders, and in publications. Individual and/or group interviews will be conducted at a place where individuals feel comfortable.

Your signature indicates that you have read and understand this form and agree to take part in this study. Please understand that by signing, you are not waiving any legal claims, rights or remedies. In addition:

1. The researcher will not record any information you do not want recorded. You may also restrict access to your recordings. If you agree to be audio-or video-tape recorded or photographed, copies of the original photographs, recordings and transcripts will be held by researchers at Oxford University for at least three years. We will keep your interview confidential if you wish. We protect your confidentiality by coding the interview materials with pseudonyms such that your identity is not directly linked to your words in transcripts or publications. You may also request to read and edit transcripts before they are finalized.
2. The researcher(s) may use the information collected from this interview to produce academic articles and/or books. In cases of doubt, the researchers will try to check interpretations and conclusions with you, but will acknowledge their responsibility for any errors.
3. You understand that participation is voluntary. You may either refuse to participate or withdraw from the study at any time.
4. You understand that your information may be used in future publications.
5. You understand that you will be given a copy of this Informed Consent Form.

If you have questions about the study itself, contact:

Tom Leveridge

Email: tom.leveridge@ouce.ox.ac.uk

Telephone: (+44) 07886611853.

_____ Date _____
Participant signature

Please indicate consent by initialing each statement below.

I agree to participate in this study by _____ being interviewed.
_____ being audio- or video-tape recorded.
_____ being photographed.

Please circle the appropriate answer.

I would / would not like to be identified by name in publications.

I would like the materials to be deposited at _____ (indicate where).

State conditions under which material related to your interview could or could not be released:

As researcher, I agree to abide by your wishes as outlined on this form.

_____ Date _____

Appendix B

Interview schedule

Date	Time	Participant	Organisation
06/07/2009	09.00	Participant A	Institute of applied sciences
07/07/2009	10.30	Participant B	Conservation International
08/07/2009	10.45	Participant C	Institute of Applied Science, USP
08/07/2009	15.00	Participant D	Foundation for the peoples of the South Pacific International (FSPI)
09/07/2009	10.00	Participant E	Wildlife Conservation Society
09/07/2009	14.30	Participant F	Institute of Applied Science, USP
13/07/2009 until 20/07/2009: Visit to the Tavua community in Ba Province - conducted a semi-structured interview with the FLMMA community representative for the Tavua District. I also had informal interviews with the chief, fishermen, women, youth and religious groups.			
22/07/2009	14.00	Participant G	Institute of Applied Science, USP
23/07/2009	10.00	Participant H	Partners in Community Development, Fiji (PCDF)
23/07/2009	14.30	Participant I	WWF
23/07/2009	16.00	Participant J	SeaWeb
24/07/2009	14.00	Participant K	Institute of Applied Science, USP