Operationalising resilience and getting culture back in

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Abstract:

It is increasingly suggested that societies must be resilient to be safe and sustainable. While there are many approaches to resilience available, not all of them operationalize the concept to the extent of guiding what to look for when observing actual communities. This is a requisite for linking the conceptual and the actual, and vital for our ability to develop societal resilience. Drawing on research in two coastal communities in Fiji, the purpose of this paper is to present one way of operationalizing resilience that makes that link and accentuates culture as an explicit contributor to resilience.

Introduction

Our world is in a precarious state and disasters disturb, disrupt and destroy the lives and livelihoods of many. Although the global death toll is lower today than a century ago (CRED 2013) and all human development indicators have largely improved since then (*Gapminder,* 2013), our expectations have also been adjusted at the same time as the number of disaster events and affected are growing (CRED 2013). We have come to realize that our future is uncertain and that our world is complex and dynamic, making much of our traditional ways of grasping and addressing issues of safety and sustainability inappropriate in our contemporary world. It is in this context that the concept of resilience comes in, as it is repeatedly suggested that communities must be resilient to be safe and sustainable (e.g. Levin *et al.* 1998; Perrings 2006; Becker *et al.* 2011).

There are many approaches to resilience, coming out of a wide range of disciplines from psychology (e.g. Cohen *et al.* 2011) to engineering (e.g. Petersen & Johansson 2008). While the exact meaning of the concept differs (see Pendall *et al.* 2010), there has been a proliferation of publications focusing on the importance of resilience for safety and sustainability (Comfort *et al.* 2001; Hollnagel 2006; Perrings 2006; e.g. Coaffee 2008; Rockström *et al.* 2009a; Cutter *et al.* 2010; Duit *et al.* 2010). Many of these approaches to resilience focus exclusively on the conceptual, with little or no emphasis on actual conditions in communities. Others attempt to identify factors for resilience in practice, while paying little attention to how they link to theoretical notions of resilience. Though there are notable exceptions attempting to provide a link between the conceptual and the actual (e.g. Cutter *et al.* 2008), most approaches to resilience either do not give much guidance what to look for when studying resilience in practise, or any clear framework for linking observations to theory.

Numerous scientific disciplines contribute to the increasingly prolific literature on resilience in relation to safety and sustainability, but many are influenced by the instrumental work of ecologists (e.g. Oliver-Smith 2013). There is nothing wrong with that, as long as each discipline maintains its own raison d'être. It is therefore interesting to note the relative absence of the fundamental concept of culture in the resilience focused literature that seems to be gradually overtaking the more disaster focused literature of the past. In other words, it is time for applied anthropology to reclaim its

central position in the scientific endeavour to promote safe and sustainable communities.

The purpose of this paper is thus to suggest one way of operationalizing resilience to link the conceptual and the actual, and to show that culture is fundamental for explaining, understanding and improving the resilience of vulnerable communities.

Concepts of resilience

The concept of resilience is not in any way a new concept just because it rose to fame relatively recently. It is much older than commonly held and neither originally conceived by engineers to describe the performance of objects they bend, stretch or compress (e.g. Rankine 1858:273), nor by ecologists to describe stability and complexity of ecosystems (e.g. Holling 1973; Pimm 1984). In fact, the word was used as early as a few centuries AD by the Archbishop of Constantinople and found its way into scientific English in the first decades of the 17th century, when Sir Francis Bacon used it to describe the strength of echoes (Alexander 2013). However, the use of the concept of resilience has literally exploded in recent years.

When looking at how the concept of resilience is used in various scientific disciplines, it appears to have three main categories of definitions (Pendall *et al.*2010). First of all, there is a large group of definitions describing resilience in different ways as ability to "bounce back" to a single equilibrium (e.g. Pimm 1984; Cohen *et al.*2011:14). This means that the system of interest is conceived as having one stable state (Figure 1) and its resilience is defined in relation to the "resistance to a disturbance and the speed of return to the equilibrium point" (Berkes & Folke 1998:12). These approaches to resilience might be applicable in a whole range of context, but not if interested in vulnerable communities over longer time periods than the immediate. Critical infrastructure systems may have a preferred stable configuration, but anthropologists have pointed out for decades that human societies are dynamic (e.g. Malinowski 1945) and cannot be conceived as having any stable states over time.

Secondly, another substantial group of definitions describes resilience in different ways as a measure of robustness or buffering capacity before a disturbance forces a system from one stable equilibrium to another (e.g. Holling 1973; Berkes & Folke1998:12). This means that the system of interest is conceived as having multiple possible stable states and its resilience is defined in relation to how much stress it can absorb before shifting from one state to another (Figure 1). Again, such approaches have been fundamental in explaining key phenomena in several disciplines, but are generally not suitable for describing the resilience of communities for the same simple reason as above.

Finally, the third and perhaps youngest group of definitions describes resilience as ability to adapt in reaction to a disturbance (e.g. Pendall *et al.*2010:76). This means that the system of interest is conceived as not having any stable states, but instead a state of constant adaptation to maintain its coherence in our changing world. Such systems are generally referred to as complex adaptive systems (Figure 1) and it has been repeatedly suggested for almost half a century that society, in full or in parts, can be perceived as such system . However, applying this notion of resilience on systems that includes human beings ignores two of the most fundamental qualities that distinguish such systems from all others. Human beings are not only reactive agents in relation to actual situations, though such input seems to be most persuasive (Tversky & Kahneman 1973; Johnson & Levin 2009:1594-1596; Slovic 2010:95-96). We are also proactive agents

with the ability to anticipate potential disturbances, as well as endowed with the ability to learn from the experiences of others.

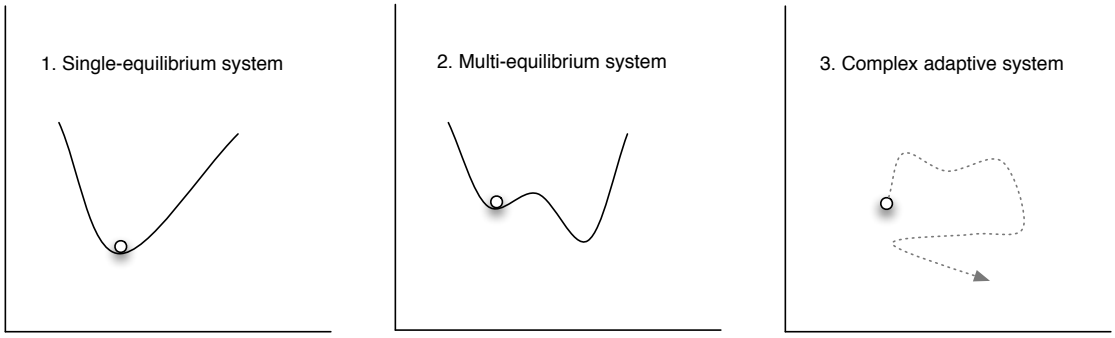

Figure 1. Three common categories of approaches to resilience (based on Pendall *et al.*2010).

To summarize, these three main categories of definitions of resilience all have their strengths and shortcomings. Although they are useful for their intended purposes, none of them are sufficient for explaining, understanding or improving community resilience. The first two categories disregard the dynamic nature of communities, while the third ignores our very human aptitude for anticipation and learning. However, we can still build on these contributions and I believe it might be fruitful to approach vulnerable communities as complex adaptive systems, with abilities to anticipate and learn.

Operationalizing resilience

Stockholm Resilience Center defines resilience as "the capacity of a system to continually change and adapt yet remain within critical thresholds" (Stockholm Resilience Centre 2012). This definition belongs under the third category presented above, and was originally conceived in relation to the influential work on planetary boundaries by leading earth systems scientists (Rockström *et al.* 2009c; 2009b). Raworth (2012) later expanded this framework with social boundaries to define a safe and just space for humanity. Resilience can thus be seen as the capacity of a community to continuously develop, while remaining within human and environmental boundaries (Figure 2). However, the main question is what capacities we need to be able to do that. It is important to note that the human and environmental boundaries, as well as our preferred expected development trajectory within them, are all social constructions and equally based on our empirical understanding of the world and on our value preferences.

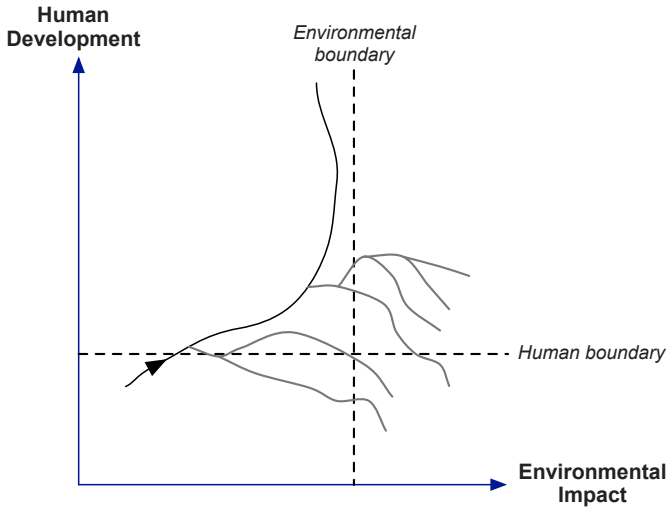

Figure 2. A preferred expected development trajectory, with potential deviations crossing human and environmental boundaries.

In other words, the resilience of a community is not absolute and objective, but relative and contextual. It is determined by internal attributes and is an emergent property of that community in the same way as Pariès' (2006:48) organisational resilience of complex organisations. This means that resilience is not a simple aggregation of various factors, but a manifest quality grounded in the complex interaction of these factors. To grasp such emergent property it is helpful to approach our community as a human-environment system, and to structure this system in a functional hierarchy from purpose, through increasingly concrete levels of function, to the perceivable forms of the system contributing in the real world to meet its purpose (Rasmussen 1985). In other words, to operationalize the resilience vulnerable communities, it helps to approach them as human-environment systems with purpose, function and form.

Purpose

Oxford English dictionary defines purpose as "the reason for which something is done or created or for which something exists" (New Oxford American Dictionary 2011). It is in other words the overall rationale for the human-environment system constructed to grasp and address the resilience of communities. Purpose is the most abstract level in Rasmussen's (1985) systems hierarchy and is helping us think about the system and focus on what is relevant for our particular purpose. If resilience is the capacity of a human-environment system to continuously develop along a preferred expected trajectory, while remaining within human and environmental boundaries, then the purpose of this system must be to protect what human beings value, now and for the future.

For a human-environment system to meet the stated purpose of protecting what human beings value, it must have the ability to perform a number of requisite functions. These functions can in themselves be conceptualized on different levels of abstraction, and though there is an infinite number of ways to describe these functions, I present one way that provides structure and rigour.

Function

The next main level of abstraction under purpose is function (*Ibid.*). It is in other words about what the human-environment system does to meet its purpose (Brehmer 2010). It has been suggested that human-environment systems must have the ability to

anticipate, recognize, adapt to and learn from variations, changes, disturbances, disruptions and disasters, for them to be able to protect what human beings value (Becker *et al.*2011; 2014). These four fundamental functions are interdependent on each other in such a way that the output of one is a requisite for another (Figure 3). For instance, the ability to adapt requires input concerning what is anticipated to have a potential to become a problem in the future, what is recognized as critical or soon to be critical in the current situation, or what is learnt to be a problem from experience (*Ibid.*).

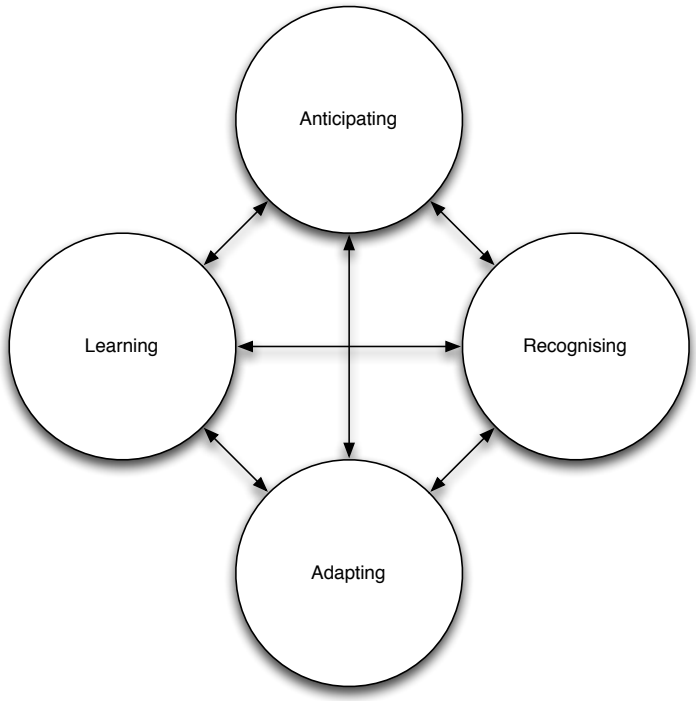

Figure 3. The nexus of fundamental functions for resilience.

The function of anticipating potential deviations away from the preferred expected development trajectory is a fundamentally proactive function in the sense of focusing on what has not yet happened. Even in the midst of calamity, anticipation is continuously providing input regarding what might happen at various future points in time, although the periods to these points tend to be shorter the more precarious the immediate situation is. Such anticipation can be implicit or explicit, and formal or informal. It can comprise not only technical risk assessments and weather forecasts, but also indigenous knowledge concerning foreboding signs in the nature, etc.

The function of recognising imminent or actual deviations away from the preferred expected development trajectory of the human-environment system is also a fundamental function for its resilience. It has both a proactive part and a reactive part, which constitute functions on a lower level of abstraction. The first constituent function for recognition is monitoring (Figure 4). This function focuses on proactive and continuous monitoring of a critical parameter in the human-environment system that is or could in the near term be causing deviations from the preferred expected development trajectory. The second and reactive constituent function is focusing on assessing the consequences of actual deviations from the preferred expected development trajectory (Figure 4). The utility of such assessment is to provide input during or right after a specific disturbance, disruption or disaster to inform reactive adaptation efforts addressing the immediate consequences and restoring the system back to the preferred expected development trajectory.

The function of adapting the human-environment system to maintain its preferred expected development trajectory regardless of what happens has also proactive and reactive parts (Figure 4). First of all, a human-environment system adapts to anticipated potential deviations from the preferred expected development trajectory by reducing the likelihoods of the deviations in the first place. This is referred to as preventing and is the preferred adaptation function if possible in relation to the characteristics of the anticipated deviation, and feasible in relation to social, technical, administrative, political, legal, economic and environment constraints (Coppola 2007:202-205). Secondly, the human-environment system adapts to anticipated potential deviations by reducing the consequences of such deviations on beforehand. This is referred to as mitigating and is the next proactive adaptation choice after prevention. In contrast to preventing, there is not a single event that cannot be mitigated as long as it can be anticipated and the activities are socially, technically, administratively, politically, legally, economically and environmentally feasible (*Ibid.*:202-205). Thirdly, the human-environment system adapts to anticipated potential deviations by preparing on beforehand to respond to and recover from them when actually occurring. This is referred to as preparing or preparedness and is the last resort in terms of proactive adaptation choices after preventing and mitigating. Fourthly, when a deviation from the preferred expected development trajectory is actually happening, the human-environment system adapts by addressing its immediate consequences. This is referred to as responding and is an inherently reactive function. Finally, the human-environment system adapts to actual deviations by restoring the system back to the preferred expected development trajectory. This is referred to as recovering and spans over all possible segments and sectors. Recovering is by far the most resource intensive function for adaptation, and should by definition be the last link of a chain of adaptation functions.

The last fundamental function for resilience is learning. Both in the sense of evaluating what happened in an actual event to inform anticipation, recognition and adaptation in relation to potential future events, as well as of learning how the human-environment system works in general. Learning is in other words a reactive function (Figure 4) driven by a continuous cycle of action and reflection (Dewey 1933; Kolb 1984; Gibbs 1988). In other words, a human-environment system experiences a concrete event, ordinary or exceptional, makes observations of what happened and reflects on them, forms abstract ideas explaining and understanding what happened, and utilises these ideas when anticipating, recognising and adapting to future events.

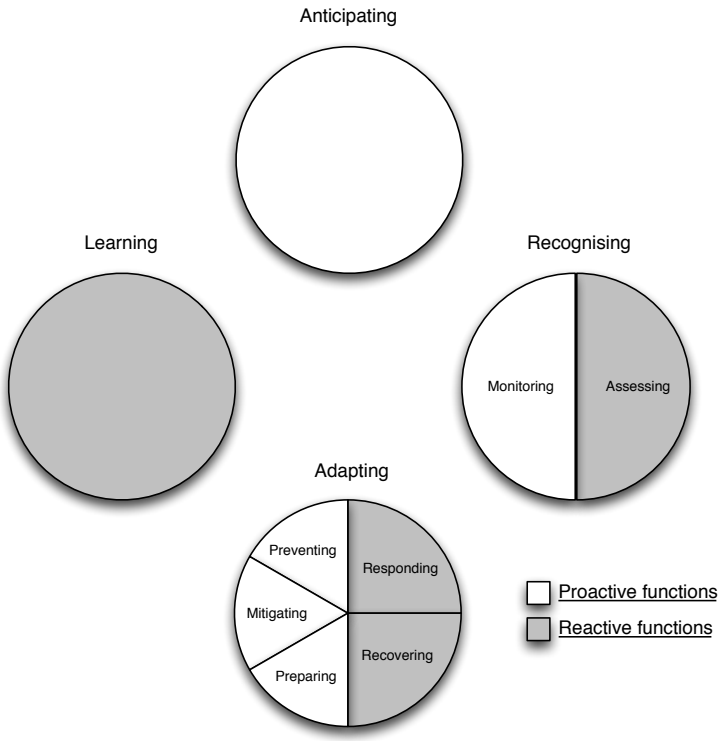

Figure 4. Four fundamental functions for resilience and their constituent functions.

To summarize, if resilience is the capacity of a human-environment system to continuously develop along a preferred expected trajectory, while remaining within human and environmental boundaries, then resilience is an emergent property determined by the ability of the human-environment system to anticipate, recognize, adapt to and learn from variations, changes, disturbances, disruptions and disasters that may cause harm to what human beings value.

Form

Form is the most concrete level of abstraction in Rasmussen's (1985) systems hierarchy and entails the myriad of interconnected elements that make up the observable dimension of human-environment systems. It is this nexus of elements that constitutes the functions to meet the purpose of the human-environment systems in question. However, it is important to note that several elements may be required for one particular function, and that one specific element may contribute to several functions.

There are numerous ways to categorise form (e.g. Becker *et al.*2011; CADRI 2011), but to facilitate the identification of what constitute the functions presented above, I suggest a general typology with four catagories: (1) Knowledge, skills, tools and other resources; (2) Organization on all levels; (3) Rules, regulations and other formal institutions; and (4) Norms, values and other informal institutions.

First of all, without knowledge, skills, methods, tools, funding, etc, purposeful activity is simply not conceivable. Fortunately, though there are always resource constraints, human beings are incredibly resourceful. The necessary human- and material resources are often seen as including formal education and technical skills and equipment, financial capital, etc. However, human beings are also endowed with other resources that have proven central for resilience for millennia. Knowledge, skills, tools and various other resources are inherent parts of culture (Tylor 1871/1920:1), regardless if you view culture as a tool (e.g. Rappaport 1968/1984:233) or as a cognitive aspect (e.g.

Geertz 1973:89). In other words, culture bestows exceptional flexibility on human-environment systems to cope with boundless diversity of social and natural settings (Halstead & O'Shea 1989:1), irrespective of access to the more formalised resources of modern industrial society. However, the increasingly dynamic character of our world, in relation to the generally slow changes in culture, might demand further integration of the two.

Secondly, the ability of a human-environment system to perform the functions for resilience is also partly determined by the organisation of the resources on relevant levels. In other words, it is not enough for a community to have hundreds of well-trained and equipped individuals if they cannot work together in any way. Such organisation comes in many forms, spanning from formal organisations, such as authorities, companies or NGOs, to other forms of social organisation along kinship, ethnicity, faith, interest, etc. In addition to individuals organizing into groups, multiple groups also organize amongst each other into an organizational hierarchy all the way up to global institutions. While all social organization is fluid and continuously reconstructed (Sztompka 1993:9-10), many formal organisations and forms of social organisation persist over years or even millennia. On the other hand, there is also organization that occurs to address a specific situation at a specific point in time, and then most often dissolves again (Dynes 1970; Quarantelli 1994). Regardless of which, all organization is the manifestation of sets of underlying formal and informal institutions (Handmer & Dovers 2007:30).

Thirdly, the ability of a human-environment system to perform functions for resilience is also partly determined by its prevailing rules, regulations, legislation, policies, etc. Such formal institutions can be codified or customary and serve to provide persistent and predictable guidelines for behaviour and interaction among individuals and organisations that facilitates coexistence and collective activities by reducing the need for constant negotiation (*Ibid.*:30). Formal institutions are actively implemented through coercion, cooperation, exhortation or a combination of more than one of the three (*Ibid.*:110-120), and are formally sanctioned by some level of organization of the human-environment system. Moreover, formal institutions are rooted in the norms, values and other informal institutions of that system.

However, the ability of a human-environment system to perform the functions for resilience is also partly determined by the norms, values and other informal institutions of that system more directly. Although informal institutions have the same purpose as formal institutions and are underlying their existence, they are without formal sanctioning and implementation. That said, informal institutions discourage deviant behaviour through various social sanctions (Helmke *et al.* 2004), such as criticism, ridicule, shame and disregard. These sanctions may be addressed directly to the deviant individual or group, or to a larger social entity they belong to, adding another dimension of social control. Again, norms, values and other informal institutions are inherent parts of culture (e.g. Tylor 1871/1920; Geertz 1973) and comprise a central part of the social structure that is both directing and being directed by human agency (Giddens 1984). They underlie formal institutions, set boundaries for and shape organization, and influence what knowledge, skills, tools and other resources that are deemed practical, preferable and even possible. Although entirely fundamental for the resilience of a human-environment system, informal institutions are notoriously challenging and slow to alter, and too often overlooked or ignored in efforts to build resilience.

Getting culture back in – resilience in two coastal communties in Fiji

Although it is most often ignored, culture is fundamental for all approaches to the resilience of vulnerable communities. I believe that most approaches are simply not designed to link between the conceptual and the actual to highlight what is essentially contributing to resilience in practice. Approaching resilience as an emergent property determined by the ability of the community to anticipate, recognize, adapt to and learn from variations, changes, disturbances, disruptions and disasters, provides such link. It does so by offering a framework for finding what observable aspects of a community contribute to performing these fundamental functions to meet the purpose of protecting what the members of the community values.

To exemplify the role of culture for the resilience of vulnerable communities, I draw on empirical research in two coastal communities in Fiji: Solevu and Dravuwalo. These communities were deemed similar at independence around 40 years ago, but have experienced very different development since then. Solevu being located on an island with intense tourism and considered more modern, while Dravuwalo being located in the periphery of the islands and considered more traditional. I do not have room in this paper to present the full comparative studies, but limit myself to draw on data from 27 semi-structured interviews (10 women and 17 men), four focus groups and observation to identify a few examples of when culture influence the form constituting the ability to perform functions for resilience of these communities.

Knowledge, skills, tools and other resources

The data from both communities are ripe with examples of knowledge, skills, tools and other resources that are based in culture, though these are generally more frequently utilized in the more traditional community of Dravuwalo. For instance, agricultural knowledge and skills are passed on from older to younger generations without the mediation of formal education, including aspects of risk management. In Dravuwalo, many families have two plantations as a precautionary measure against landslides that at times of heavy rains may destroy parts of or entire harvests. Cyclones and floods are otherwise the two most common disasters and affect different crops. Cyclones break the stem of cassava and dalo, demanding quick harvest of the former before the roots rot. Cassava can then be stored in a cool and moist place for a couple of weeks. Cassava and dalo are also vulnerable to floods, while yams, sweet potato and dalo nitana (relative to taro) can stand cyclone and flood well. The people of Dravuwalo thus choose to farm a combination of crops not only for a more pleasant variation of food on the table, but even more so as a culturally based adaptation strategy based on what they anticipate may happen and what they have learned over centuries. Especially since the tougher dalo nitana offers less pleasant culinary experience than cassava and dalo. This issue is not dealt with to the same extent in any of the interviews or focus groups in Solevu, which is explained by the fact that only a few households there have farming as a main livelihood activity, and the main part of their food is instead bought in the city of Nadi on the mainland.

Organization on all levels

The most important organising principle in both communities is kinship. Although there are community groups that play roles in village life, such as school committees and women's groups, the most essential social organisation follows yavusa (tribe), mataqali (clan) and tokatoka (extended family) lines. Kinship determines access to key natural and financial capital, such as farmland, fishing rights (qoliqoli) and redistributed income

from leasing land and boats to resorts, which are important for adaptive capacity. Kinship also provides networks of mutual support, though reciprocal behaviour and community cohesion is more visible in Dravuwalo than in Solevu. There is no doubt that people in Solevu take care of each other when it really matters, such as sharing their house or assisting others in disasters. However, it is clear in the accounts of the respondents in Solevu that most dealings between people from different households follow market principles. In other words, they pay cash in exchange for the goods or services they get. There are exceptions in Solevu too, such as a man in Solevu giving a yaqona ceremony and presented a pig to the man who built the extension of his house, but the situation is different in Dravuwalo where people help each other without money or goods changing hands. For instance, if a person with a boat goes fishing, or to the main town on the island for shopping, anyone who wants to come along can do so without paying. Moreover, all farming in Dravuwalo is done in groups of seven to eight men decided by the village meeting. Before they tried to have these groups within a tokotoka, now they divide into mataqali or other groups including the minister. They work together one day per farm, which is the traditional way in Fiji. After they are done working together on all their farms they can farm on their own. Also the women in Dravuwalo organise into kinship groups for weaving mats, fishing, etc. In Solevu this system is not used any more and people work on their own, or mainly within their immediate family. The social organisation of the two communities is central for community resilience and it appears that the contribution of greater social capital in Dravuwalo at least matches the greater access to financial capital in Solevu, which is not equally distributed.

Rules, regulations and other formal institutions

Although not generally codified, there are several examples of rules, regulations and other formal institutions that are designed to increase community resilience. For instance, the customary tabu areas where fishing is not allowed. These are strictly adhered to based on tradition, and though most community members do not think of them in risk reduction terms they were invented to preserve particularly important reefs for conservation of fish stocks. Fishing in a tabu area is punished severely in both communities and their maintenance is likely to have played a central role in the preservation of the marine ecosystems even with substantial increase in population.

Norms, values and other informal institutions

Underlining the examples given above there are norms, values and informal institutions that are all aspects of culture. For instance, an interesting difference between the two communities is the appearance of vegetation or even fences seemingly demarcating the border between two properties in a number of places in Solevu. This is nowhere to be found in Dravuwalo. Reciprocity and communal thinking are central features of traditional Fijian culture, which are still permeating village life in Dravuwalo. For example, a man farming the land of another household of the tokatoka while the man of that household live elsewhere to work, or the trained mechanic fixing generators or motors for others in the village without payment. There are obviously exceptions here too, and it is interesting to note that the one person in Dravuwalo earning money from working in a resort is also the one person hiring others to work on his farm. However, the people of Dravuwalo are not only helping each other when it really matters, if a family looses their house or looses their harvest, but in everyday life. This is also the way the woman with her husband living elsewhere would survive, according to herself, if he passes away.

Dravuwalo has also kept a more elaborate reciprocal tradition in the form of communal fishing expeditions, which are decided by the village meeting, and gather all young men under the leadership of the Tui ni dau, the head of the fishermen mataqali (clan). Depending on the nutritional needs of the village, these expeditions happen once a month, sometimes twice, and even three or four times per month in rare occasions. When they have plenty of fish in the boats they come back to the village, meet in the community hall with the chief and all five mataqali and present the fish to them to be shared with all households. Also the women share the catch of their more everyday fishing among themselves. Similar traditions are not kept alive in Solevu any longer.

Conclusion

Operationalising resilience by approaching communities as human-environment systems with purpose, functions and forms seems to be a fruitful way forward to theoretically inform practical activities for safety and sustainability. Moreover, it facilitates the reintroduction of culture as a fundamental basis for resilience. Culture pervades many, if not most, aspects of a community. It provides crucial knowledge, skills, tools and other resources necessary to anticipate, recognise, adapt to and learn from variations, changes, disturbances, disruptions and disasters. It entails social organisation, rules and regulations, as well as norms and values, which are central for community resilience. Time has come for applied anthropology to reclaim its central position on the scientific and practical arenas for a safer and more sustainable world, and it will happen by getting culture back in.

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