

Climate Change and Social Change: Vulnerability and Adaptation in Rural Vanuatu

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ABSTRACT

What is the nature of vulnerability and resilience to climate change at the community scale in Pacific island countries (PICs)? What approaches to climate change adaptation are most appropriate at this scale? These questions are examined in the context of rural Vanuatu, a Melanesian least developed country particularly susceptible to changes in climate variability and extremes. Fieldwork on the island of Mota Lava interpreted vulnerability by beginning with local perceptions and experiences of dealing with climate risks. Vulnerability to climate arises from a context of rapid social change. Processes of social change affect the ways and degree to which communities are able to cope with climate stresses such as tropical cyclones, drought and heavy rain. Aspects of endogenous resilience may be threatened, especially where resilience depends on flexibility and self sufficiency, and particularly given increasing climatic uncertainty in the future. In this context therefore, 'adaptation to climate change' requires communities to adapt to both changing climatic and social situations.

Keywords

Adaptation, Climate Change, Resilience, Social Change, Vanuatu, Vulnerability

1. INTRODUCTION

This paper examines the factors and processes influencing vulnerability and resilience at the community-scale in rural Vanuatu. The purpose of this is to interpret the implications of this vulnerability/resilience for community-based adaptation to climate change (CBA) projects. The importance of community-based adaptation (CBA) is becoming increasingly recognised by institutions involved in financing and implementing adaptation to climate change, particularly in developing countries. CBA as discussed here, refers to 'planned' adaptation such as that implemented by governments, aid donors, NGOs or other organisations at the community scale. In this context, CBA is a 'bottom-up' group of responses to climate change that has gained popularity in response to the realization that national-level institutions and 'top-down' initiatives for adaptation seldom produce suitable outcomes for vulnerable communities at the local scale in developing countries.

Although CBA is a relatively new concept, best practice draws heavily on experience from community-based disaster risk reduction, and to a lesser degree, grassroots development and sustainable livelihoods [1][2][3]. The focus is generally on practical, tangible, and feasible vulnerability-reducing outcomes for groups of people [4][5][3]. The key is self-reliance, or facilitating an adaptation process that is eventually locally operable; "CBA is about the community making choices, not having them imposed from outside" [6]. The role of 'indigenous' or 'traditional' knowledge and practices relating to livelihood security and environmental stress are often particularly valued in this process. With the recent surge in recognition of CBA has come an influx of methodologies and approaches dedicated to identifying "vulnerability to climate change" and, subsequently, "adaptation measures", often in a participatory way. In all these, building adaptation measures from the priorities of local people is explicit.

This paper aims to illuminate the way in which local people conceptualise their vulnerability to climate and to highlight some potential tensions between this, and the way in which vulnerability - and subsequently 'adaptation' - is dominantly addressed. The ensuing discussion is informed by fieldwork undertaken in late 2008 on the small island of Mota Lava in the northern Banks Islands group of Vanuatu. Fieldwork interpreted local perceptions and experiences of dealing with climate stress, employing a participatory approach.

2. THE NATURE OF VULNERABILITY AND RESILIENCE IN MOTA LAVA

In Mota Lava, people perceive themselves as less able to deal with climate stress as in the "*taem bifo*" ("time before"). According to local participants, their grandfathers and great-grandfathers were in many ways better able to cope with environmental perturbations. A range of complex activities, processes and systems reduced risks posed by climate variability and extremes, based on generations of living with environmental uncertainty. Importantly, these were largely woven into the fabric of everyday life and *kastom*¹. This was not necessarily conscious, but merely

¹ "*kastom*...is a whole way of life that dictates almost all of one's actions and provides its own particular interpretation for almost everything that happens" [7]

part of the way of doing things; yearly, monthly and daily. However, participants felt that this is largely no longer the case, meaning that dealing with climate stress is less self sufficient and more uncertain than in times past. Importantly, non-climate processes - often identified as prominent general concerns in the communities irrespective of climate stress - are at the root of most climate problems identified, and this is quite obvious to local people.

2.1 Tropical cyclones and food security

Many of the reasons for this increasing uncertainty boil down to rapid social change. Figure 1 illustrates this using the example of food insecurity in the incidence of tropical cyclone. This issue was of particular concern to participants and as such, became the focus of most discussions. Mota Lava was affected by Cyclone Funa in January 2008, nine months before the fieldwork commenced. Participants pointed out that although Funa was a relatively minor cyclone (severe cyclones were experienced in 1939 and 1972), food shortages and resultant stresses were the worst in memory and still an issue nine months later. Social, cultural and economic changes in Mota Lava have altered the nature of agriculture and food acquisition to a less self-sufficient form. The contemporary ability to obtain sufficient and sustainable supplies of food is perceived to be more uncertain than in the past, and this is attributed mainly to less robust subsistence agricultural systems and increasing dependency on external resources namely disaster aid, imported goods, money and knowledge.

2.1.1 Traditional mechanisms of resilience

The immediate reasons for food insecurity are presented in the innermost circle of Figure 4 and generally represent an erosion of 'traditional' practices (see Campbell [8] for a comprehensive historical account of these). Generally, the bigger, more plentiful, more diverse, and more productive a family or individual's gardens, the more crops remain consumable in the incidence of climate stress. In the past, high daily labour inputs, long fallows, specific planting months, and an abundance of land facilitated this. A yam (*Dioscorea spp.*) crop was planted mid-year so as to be mature in time for cyclone season. Amounts of yam surplus to general consumption requirements were grown and stored in houses for celebrations and exchange, also providing a food source in case of shortage. Gardens of extreme weather resilient wild-yam (*Dioscorea nummularia*) varieties were planted specifically in preparation for times of shortage. A further important food 'back-up' was provided by areas of wild-growing yam that were sustained by traditional resource management institutions; community Chiefs would put in place *tabus* (restrictions) on harvesting in times of plenty, and particular harvesting techniques were employed to ensure sustainability of the wild stocks.

Knowledge of changes in weather and environment signaling an impending cyclone enabled mature crops to be harvested and stored in preparation, providing an important food source in the weeks following the event. Immediately following a cyclone, gardens were replanted with a mixture of fast and slow growing crop varieties to ensure rapid but sustainable recovery. Preserving food throughout the year was important: large quantities of breadfruit (*Artocarpus altisor*) were dried and stored to be consumed in times of shortage, and flour was made from cassava

(*Manihot esculenta*). Numerous wild-growing foods not normally consumed could be called upon in times of stress.

The perceived importance of many of these traditional processes and activities is declining and many a) are no longer widely prevalent (i.e. garden size, agricultural calendar or b) have been lost altogether (some famine foods, yam storage).

2.1.2 Contemporary vulnerability

Participants were quick to point out the underlying causes of this. The most prominent of these are presented in the second circle in Figure 1, although they are far more complex, overlapping and interconnected than the diagram affords. In general, current labour inputs to gardens are far lower and less regular due to a myriad of factors, most prominently: loss of agricultural knowledge; loss of *kastom* education system and subsequently loss of respect for traditional agricultural practices and ethics; declining interest and motivation regarding agriculture; increasing role of imported food; and increasing time commitments to festivals, church and school.

Cropping practices and fallow systems are changing. The current fallow on some parts of the island is essentially non-existent due to population growth, land shortages and intra-family land disputes: many are frightened to leave a garden to fallow as extended family members will take over. This situation is linked to a breakdown of the traditional systems of land allocation via maternal inheritance and ceremony. As discussed in depth by Campbell [8], changing proportions of crops over time - in short less yam and more 'non-indigenous' crops - have exacerbated this problem by adding an additional stage to the fallow. Importantly, yam (requiring high labour inputs and fertile soil) is no longer produced in quantities enabling storage, having been largely replaced by the less labour intensive cassava and taro (*Colocasia esculenta*). Unlike yam, other crops cannot be stored for long periods of time, thus removing this source of emergency food.

The other side of the coin is that many participants believed population growth, land shortages and increasing time commitments to be largely an excuse for "laziness" or lack of incentive. This problem pervades many aspects of life on Mota Lava and is tied into changes in *kastom* and culture in general. Most believed lack of motivation and labour input - particularly among the younger generations - was the real reason for declining productivity of agriculture and increasing reliance on imported food. A younger participant stated:

"In the talk of my grandfather before, he told me that - in our custom - every day you must first put some plants in the ground, so that if a hurricane hits us we have no problem with food. It is a problem with us now. I can tell you that we are lazy!"²

² Bislama: "Long toktok blong bubu bifo, hemi tellem mi se - kastom blong yumi - evri day...yu mas puttum first sam stamba long graon, makem se sipos hurricane I killim yumi, yumi no gat problem lo kaekae. Em I problem long mifala nomo. Mi save tellem yu se, mifala i laze!"

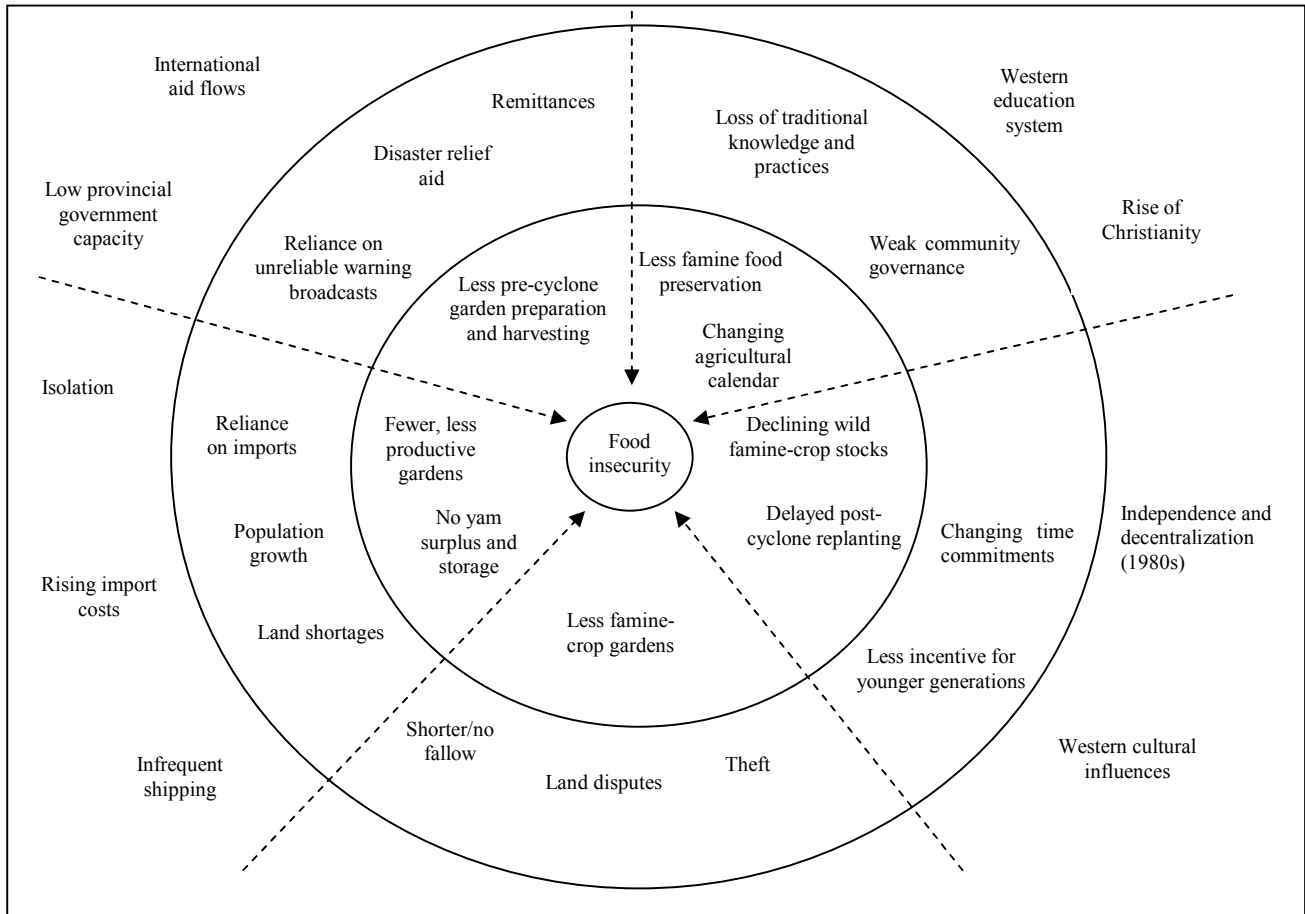


Figure 1 Factors and processes influencing vulnerability to tropical cyclone in the context of food security in Mota Lava. Each circle represents one further step of abstraction from the direct agricultural pursuits of the community

‘Laziness’ as well as increasing theft, has led to fewer wild yam ‘back-up’ gardens (the low maintenance wild yam is particularly easy to steal). Concerningly, stocks of wild-growing wild yam have declined markedly in recent years. *Tabus* are no longer put in place or enforced by leaders and sustainable techniques of harvest are not widely practiced, reducing this important source of famine food.

Increasing prevalence and reliance on imports - in both normal and *desasta* (disaster) periods - has been a major driver of agricultural change (see Campbell [8] for an overview of the rise of the cash economy and its impact on agriculture). This is self-reinforcing however: as subsistence agriculture becomes less productive, the necessity of imports increases. Contemporarily, rice, biscuits, flour and canned goods supplement diets meaning garden size, number and labour inputs required to sustain adequate access to food are fewer. This contributes significantly to reduced incentives to produce subsistence crops substantial enough to withstand a cyclone or drought. In short, greater reliance on imports in ‘normal’ times means even greater reliance on imports in *desasta* times. In times of food shortage and environmental stress, purchasing these foods from the community stores is a fundamental coping mechanism. It is important to note that this makes coping with disaster easier in many respects as the community no longer relies exclusively on local foods.

However, access to imports is uncertain due to Mota Lava’s isolation. Since Vanuatu’s independence in 1980 and the

subsequent decentralisation of government, shipping services to the isolated northern islands of Vanuatu are typified by unreliability, infrequency and general overall inadequacy. Community stores frequently run out of rice and flour, and it can be many months before a ship arrives. Rising global food and fuel prices mean the local price of rice and flour is exorbitant and rising. Although limited local economic opportunities exist on Mota Lava, export opportunity is currently near zero. As such, remittances from extensive community networks residing in the urban centers of Port Vila and Luganville enable the purchase of imports (and largely prop up the cash economy in general on Mota Lava). Unreliable access to imported food is a priority concern in the community of Mota Lava, and the importance of sustaining reliable local food sources is recognised.

The expectation of disaster relief in Mota Lava has had a particularly marked influence on food resilience. Expectation of relief has reduced incentive to ensure self-sufficient food security across the board. Expectation of relief stems predominantly from substantial shipments of aid received following major cyclones in 1939 and 1972 respectively. In fact this relief has had significant and lasting impacts on agriculture and diets in general (such as the adoption of new crops) described in detail by Campbell [8]. This is not to say that disaster relief does not play an important role in reducing impact - if aid had not been received following cyclones in 1939 and 1972, famine would almost certainly have ensued in the shorter term. However, participants explained that currently

little incentive exists in the community to plant wild-yam gardens, prepare adequate amounts of dried breadfruit and other famine foods, maintain knowledge of famine foods and preparation techniques, produce and store surplus yams, ensure mature crop harvest, and rapidly replant damaged gardens.

The implications of this were particularly apparent following Cyclone Funa as disaster relief (facilitated through the Vanuatu National Disaster Management Office) transpired to be meager and insufficient to offset local food shortages in the longer term (each family received one 25kg bag of rice only, irrespective of family size). However, as one participant put it:

“Problems with disaster are not your [aid donor countries] problem, they are our problem”³.

Many reflected this sentiment, recognising that lack of comprehensive engagement in long and short term local risk reduction strategies is the real problem, not lack of relief aid. Cyclone Funa appeared to have been something of a ‘wake-up call’. Local methods of risk reduction still exist (to an extent) in both knowledge and practice, but local people recognise that they are perhaps not utilized to their fullest extent.

Changing traditional knowledge systems underwrite many aspects of vulnerability to climate stress. For instance, many participants - especially younger generations - were either unsure of the traditional agricultural calendar, or were aware but did not follow it. Many older participants recalled their parents gathering and preparing traditional famine foods such as sago palm starch, but were unsure of the techniques themselves as their parents had not passed down the knowledge. Although many older participants were aware of traditional weather signs signaling an impending cyclone, reliance on an unreliable radio broadcast is now the norm⁴. Participants of all ages blamed loss of environmental knowledge on a lack of emphasis on *kastom* education in the community. Formal schooling based on a ‘Western’ model, means young people have less time to participate themselves in gardening, story telling, and other activities that traditionally built the knowledge base necessary for both general and *desasta* food security. However, equally as important as the knowledge itself is ‘respect’ for the knowledge and thus, the incentive to put knowledge into practice. Participants felt that today, Western education and increasing outside cultural influences are reducing respect for *kastom* systems in general. A complex history of missionaries, the cash economy and indentured labour (see Campbell 1990) has changed the nature of *kastom*. The implication of this for vulnerability to climate stress is that many risk reducing activities, processes and systems woven into everyday life (whether these be directly or indirectly related to climate stress itself) are now of less priority.

A related issue is that of community governance. Many participants felt that a rather fragmented Chiefly system impinges on the community’s ability to sort out their own problems. This is a complex product of Mota Lava’s history and changes in *kastom* Chiefly system from inheritance and ceremonial rite, to

3 “Problem blong desasta em I no problem blo yufala [aid donor countries] em I problem blo mifala”

4 Mota Lava has few working radios, very limited radio reception, and limited telecommunications. As such, the community was unaware that Cyclone Funa was coming and therefore did not make the usual short term preparations.

‘democratic elections’. Participants (and indeed Chiefs themselves) explained that Chiefs and leaders often did not fulfill their roles, were often not aware of their responsibilities, and seldom worked together effectively. As such, community welfare matters - such as labour and resource sharing following a cyclone - often fall to church leaders, and as there are seven different denominations on Mota Lava, this is not always a fluid process. The consequences of weakening governance are that, in short a) decision making and planning is very difficult and b) community cohesion is compromised. Thus, although many recognise and are concerned about problems such as eroding *kastom* and knowledge among young people, land disputes, theft, lack of economic opportunity, and lack of disaster preparation, actually addressing these problems at a community scale is very difficult. The solution to this inertia appears to be to look to outside institutions, finances, and knowledge to help solve problems - resources that are not readily available in the isolated northern islands

3. IMPLICATIONS FOR ADAPTATION

CBA is fundamentally about building adaptive capacity and engendering self-reliance in dealing with climate change. In rural Vanuatu, non-climate factors and processes largely drive stimulus-specific vulnerability; vulnerability is distinctly both ‘event-centered’ and ‘everyday’ in local eyes [9]. This has important implications for planned CBA: as well as improving coping strategies to deal with specific climate stresses, building adaptive capacity requires initiatives to address longer term processes enabling resilience. i.e. rather than being merely about the *methods* of dealing with climate themselves, CBA needs to address the factors and processes *enabling these methods to develop and evolve* in ways suitable to local contexts. As emphasized by Barnett [10], in the context of climate change and PICs,

“the pursuit of resilience is integral to the development of adaptive capacity. This is because, as a general if not near-universal rule, an integral feature of resilient systems is an ability to learn from, and reorganize to meet, changed conditions”

As the case study of Mota Lava illustrates, the factors and processes ultimately enabling or constraining resilience are largely social and cultural. Fundamentally, addressing this may require activities seemingly unrelated to climate or climate change itself. Indeed, this may be viewed as more of a ‘development’ problem.

Practical vulnerability assessment approaches such as those commonly employed in CBA, appear to focus mostly on generating specific ‘coping strategies’ to deal with specific impacts of a particular climate stress. This is obviously important and necessary, especially where a community is ‘urgently’ vulnerable and at extreme risk from climate stresses. However, addressing stimulus-specific coping strategies (both currently and in the future) is only half the equation in terms of adaptation to climate change. In the context of disasters, Allen [11] contends that “disasters can only be fully understood and addressed through the consideration of everyday livelihoods and underlying vulnerability”. This is perhaps even more pertinent in the context of CBA, given the need engender self reliance to deal with an increasingly uncertain climate. In the case study examined this makes the most sense in local eyes.

Whether or not initiatives to address this ‘resilience’ aspect of adaptive capacity should - or can - actually be called *adaptation* is

contentious. Schipper [12] contends that there are “numerous factors determining vulnerability that cannot explicitly be affected by adaptation”, in the way that ‘adaptation’ is currently defined and framed in discourse sustained by policy negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) and by the Intergovernmental Panel on Climate Change (IPCC). Within these frameworks activities qualifying as ‘adaptation to climate change’ remain concentrated on addressing impacts directly related to specific climate stress, despite the rise of a ‘vulnerability-led’ approach to adaptation over the past decade. It is therefore difficult to prove adaptation ‘additionality’ in an initiative indirectly related to climate, despite its possible merit in generating adaptive capacity. This is perhaps a partial product of the disciplinary roots of, and dominant epistemological perspectives in international climate change institutions such as the UNFCCC and the IPCC. Regardless of the reasons, it is suggested here that this works at the expense of ameliorating the underlying condition of vulnerability at the community (and indeed any) scale. As local perspectives reflect, ‘underlying vulnerability’ is equally as important as ‘climate stress specific’ vulnerability.

In Vanuatu, processes of social change underlie much of vulnerability to climate stress. ‘Social change’ in itself is in many ways inevitable and should not necessarily be viewed negatively. However, the ways in which communities are able to adjust to *social change* has important implications for the ways in which they are able to deal with *climate change*, given that social change appears to alter the nature of resilience. This further highlights the point that initiatives to address merely climate-specific aspects of vulnerability may be somewhat ‘band-aid’ measures. Adaptation in a local context requires processes to address social and cultural issues as well as climatic ones, enabling communities to deal better with environmental uncertainty *in a way that suits them*, without losing the value systems and practices that underpin their way of life. In short, “adaptation” should be about adjusting to both climate and social change.

4. CONCLUSION

Based on insights from the field, this paper argues that CBA – and the assessment processes involved – would benefit from greater emphasis on the ‘non-climate’ factors influencing vulnerability and maintaining resilience. It is suggested that although most approaches to CBA pay lip service to these, in reality assessments and outcomes remain too concentrated on aspects of vulnerability *directly* related to climate stress and climate change, while it is often the state of ‘everyday life’ that makes this necessary in the first place. The paper concludes that given the nature of vulnerability and resilience (in the context of climate change) at the community scale in rural Vanuatu, CBA to climate change requires a holistic approach, practically addressing both climate and non-climate aspects of vulnerability. If ‘adaptation’ means reducing vulnerability, it must target stresses that are a reality at the local scale – whether or not these are obviously related to climate or climate change. Building a foundation of resilience is integral to adaptive capacity. The success and sustainability of ‘adaptations’ aimed at increasing the ability of a community to self sufficiently cope with climate stresses is likely to depend on this foundation - as this case study demonstrates. Sustainable

adaptation at the community scale is likely to require finding creative ways to address local concerns and priorities whilst increasing adaptive capacity. Addressing merely direct climate-related aspects of vulnerability for adaptation to climate change is likely to put the ‘cart before the horse’ in many community contexts.

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