Climate change, natural hazards, and relocation: insights from Nabukadra and Navuniivi villages in Fiji

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Abstract

Coastal communities in Fiji are considering planned relocation to safer locations due to the effects and risks of climate change and natural hazards. Decision-making prior to relocations is complex, with multiple drivers for and barriers to community relocation. Following Tropical Cyclone Winston (TCW) in 2016, the Government of Fiji accelerated vulnerability assessments in the effort to rebuild and recommended a number of villages relocate for safety and has now developed national guidelines to manage relocations. This paper uses two case studies in Fiji, Nabukadra and Navuniivi villages in Ra Province, which were both heavily impacted by TCW. Only Nabukadra village is considering retreating, due to its more vulnerable physical location. An eventual lack of investment has meant that Nabukadra continues to be located at the same site, with only incremental changes being made by residents themselves. Qualitative research conducted through interviews in these two villages on perceptions of climate change, vulnerability, natural hazards, and relocation informs an assessment of the barriers to and drivers for relocation.

1 Introduction

Climate change is impacting island peoples' health, livelihoods, food security, and housing through sea-level rise and increased storm surges, changing rainfall patterns and warmer sea temperatures (Republic of Fiji 2012; Nurse et al. 2014). In Fiji, the effects of climate change are observable. Despite having a relatively large land mass and mountainous terrain, climate change is impacting low-lying coastal communities, and many are becoming uninhabitable. In these circumstances where the location of a community is no longer viable due to

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environmental loss and climate change, and as a last resort where other measures have failed, community relocation is being considered to higher, safer sites.

Relocations are the planned movement of a community from one location to another due to the effects of climate change, and usually involve a partner agency or authority (usually the state) (Hino et al. 2017; Oakes 2019). In this context, ‘community’ is a generic term referring to the people of a village, a formal settlement, an informal (squatter) settlement, or a sub-community within a larger urban area. In this paper, it refers particularly to the people of an indigenous Fiji village.

The Fiji Government recognises the risks posed to communities from climate change and natural hazards, and has been proactive in developing national relocation policies (Barnett and Mcmichael 2018). The government accepts that available in situ climate adaptation strategies may be too costly, unavailable, or unable to secure the long-term sustainability of certain communities, and has been a world leader in developing guidelines to manage the process of relocation (Government of Fiji 2018). The government was conducting community vulnerability assessments, and identification for relocation, of those communities which were most at risk of climate change in February 2016 when Tropical Cyclone Winston (TCW) hit Fiji and caused widespread damage.

Community relocations require planning, coordination and organisation, consultation across sectors, and, critically, community participation; however, an event like TCW can challenge good planning processes. A well-managed relocation is intended to be a climate adaptation and development strategy (Mcnamara and Des Combes 2015), but it can also constitute maladaptation if poorly executed. Relocation can be risky and harmful and can cause loss and damage for residents relating to culture, sense of place, the natural environment and resources, and costs associated with the relocation (Mcnamara et al. 2018). Fiji’s relocation guidelines (Government of Fiji 2018) are an initial step in assessing and addressing these risks. The guidelines are intended to formalise the relocation process and provide legitimacy within the legislative and policy frameworks, as well as a useful reference for communities to plan (COP 23 2017).

This original research provides insights from the two case studies, Nabukadra and Navuniivi villages in Ra Province, Fiji. It builds on the recent literature that is increasingly exploring the complexities related to the social, political, and cultural aspects of relocation decision-making, which overlay the technical and environmental aspects of climate change and physical relocation (Mcmichael and Katonivaliku 2019; Bertana 2019; Oakes 2019; Barnett and Mcmichael 2018; Charan et al. 2017; Hino et al. 2017). The two research sites are both impacted by climate change and experienced extensive damage from TCW. For different reasons, examined in this paper, neither has relocated. Community perceptions of climate change and natural hazards, as well as perceptions of relocation, timing, and support from the state, inform the analysis of how decisions are made in the early phase prior to relocation. The roles of community members and other actors, such as the government and non-government sectors, are also examined in this research.

This article is built on the literature on the decision-making process prior to relocations taking place, whereas other studies in Fiji examine the process after the relocation has taken place or works have commenced (Charan et al. 2017; Bertana 2019). The comparison between two villages, one which will not relocate, also provides useful insights into community perceptions of timing, vulnerability and of climate risk (Oakes 2019; Mcnamara et al. 2018). While the effects of climate change are tangible and visible, they are not yet existential threats to either village. Longer-term projections and anticipation of climate risks may be valid, but

are difficult to act upon, particularly where resources are limited (McMichael and Katonivualiku 2019; Oakes 2019), whereas the effects of TCW were immediate and devastating for both villages, but also provided an opportunity to rebuild in a safer location. This article explores the at-times paradoxical and competing dual timeframes of slower-onset climate change and the sudden effects of TCW in the context of adaptation and relocation decision-making.

This paper begins by briefly reviewing background to community relocations in the Pacific Islands, including relevant policies of the Fiji Government. Sections 3 and 4 introduce the research sites and outline the geography of the sites and the qualitative methods used in this study (mainly on-site interviews). Section 5 lists the main findings to emerge from the interviews. This is followed by discussion and conclusions. There are also Appendices (in an online supplement) giving further methodological detail and outlining a conceptual framework that helps to explain the results.

2 Background on community relocation in the Pacific Islands

Gharbaoui and Blocher (2017) and Weir et al. (2018) are among the few authors to make the useful distinction between three levels of community relocation. In order of cultural, social, and political difficulties, they are:

- (a) relocation within the community's own (village) land;
- (b) relocation elsewhere within the same country; and
- (c) relocation (emigration) to another country.

Only about half of recorded community relocations in the Pacific are driven by climatic factors; most of the other relocations were driven by armed conflict or major projects such as mines, new airports, or nuclear testing (Campbell et al. 2005; Mcadam 2014).

2.1 International relocation

Case (c), international relocation, has attracted extensive discussion, both in the academic literature and in the international negotiations on climate change treaties, particularly in relation to those countries composed exclusively of low-lying atolls, such as Kiribati, Tuvalu, the Marshall Islands, and the Maldives, where sea-level rise threatens to render the whole country unliveable, thus raising a host of legal, moral, and practical issues for the countries which are seen as responsible for this hazard (see for example, Mcleman and Gemenne 2018; Curtain and Dornan 2019; Constable 2017; Mcadam 2010; Lopez-Carr and Marter-Kenyon 2015). Several journals have run special issues on the subject, including *Forced Migration Review*, *Population and Environment*, and *Climatic Change*.

2.2 Relocation elsewhere in the same island country

Most Pacific Islanders (except in Papua New Guinea) live on the coast. Many of those who live in non-atoll countries, particularly those who live directly on the coast or in low-lying river deltas, may be forced by the impacts of climate change to move. It is most likely they would move to another part of the same country. The most widely publicised case of

relocation within national boundaries is that of the Carteret islanders, some of whom have been displaced from their home atolls, outlying islands of Papua New Guinea, to elsewhere in that country (Connell 2016).

The United Nations High Commission for Refugees, in partnership with the Brookings Institute and Georgetown University, has developed guidelines on the process that states should make for relocation carried out under the authority of the State, taking place within national borders, and undertaken to protect people from risks and impacts related to disasters and environmental change (UNHCR 2015, 2017). However, to date, the effect of these guidelines in the Pacific has been limited. For example, in part because of the low-lying outlying atoll Ontong Java, at risk of sea-level rise and cyclones, the Solomon Islands government has been attempting for several years to develop guidelines for community relocation, but so far no agreed guidelines have yet emerged there (Monson and Fitzpatrick 2016). Nevertheless, several small communities in Solomon Islands have relocated, often losing much of their sense of community while other larger communities have been unable to do so (Albert et al. 2018).

2.3 Relocation within a community's own land

A key factor impeding possible climate-driven relocations to land in the same Pacific Island country but held by another community, or even to government-owned land, is the 'essential link' between Pacific Islands people and their land (Campbell 2014). This is why only a few such cases have been documented, and also why most of the 42 Fiji villages identified by the Fiji Government as eligible for assistance with relocation are considering only relocation on their own land (i.e. case (a)). Such relocations are sometimes referred to as 'managed retreat'.

With most land in the Pacific Islands held in customary ownership, essentially by the local villagers, the bond between indigenous people and their land, expressed in the concept called *vanua* in Fijian, is important throughout the Pacific. One Fijian anthropologist (Ravuvu 1983, p. 70) summarises the concept:

[*Vanua* means not only] the land area one is identified with, and the vegetation, animal life and other objects on it, but it also includes the social and cultural system - the people, their tradition and customs, beliefs and values, and the various other institutions established for the sake of achieving harmony, solidarity and prosperity within a particular social context (see also, Nabobo-Baba 2010; Batibasaga et al. 1999).

Coordination between actors is key to successful relocation, and in Fiji must reflect local governance and social structures. Interviews with the participants highlighted this structure—Fijian villages are subject to three separate but interlinked governance structures: the village headman (*turaga ni koro*) who reports to the Fijian government through the provincial office; the traditional cultural leadership structure (the chief); and the church. In indigenous Fijian (*iTaukei*) society, major decisions affecting the village are undertaken communally. Informal discussion sessions (*talanoa*) at which everyone—or at least all adult men—are free to speak and to be heard politely are a significant part of the process. There are also formal village committees (such as the women's committee, the disaster and emergency committee) to consider particular aspects or more specialised matters. An emerging consensus decision becomes official when endorsed by the traditional chief (I'Taukei Affairs Board 2015). Consensus decisions are important for

successful relocation to take place, and decision-making can take time (Bertana 2019). Also important are the separate clans (*mataqali*), who as sub-communities of the village collectively own all the village land and control its usage.

2.4 Fiji policy

Following lengthy consultations beginning in 2012 and with the recent experience of relocating Vunidogoloa village in mind (Charan et al. 2017), the Fiji Government issued guidelines in 2018, which outline a consistent procedure for communities to follow in approaching government for financial or technical assistance for relocation (Government of Fiji 2018). These relocation guidelines are complementary to the *Disaster Management Act and Plan 1998* and sustainable development frameworks (Ministry of Strategic Planning National Development and Statistics 2014). Because almost all of Fiji's 300 inhabited islands are at least moderately hilly, relocation in the form of 'managed retreat' from vulnerable areas is feasible without the need for international migration. Therefore, the Fiji Government's guidelines are confined to cases (a) and (b), namely:

The voluntary, planned and coordinated movement of climate-displaced persons within [a State] to suitable locations, away from risk-prone areas, where they can enjoy the full spectrum of rights including housing, land and property rights and all other livelihood and related rights.

The extensive damage caused by TCW in February 2016 injected a sense of urgency and prompted a rapid completion of the relocation and vulnerability assessments which were taking place across the country. The vulnerability assessments led to the government identifying 42 villages (so far) as deserving of assistance for relocation (Government of Fiji 2017).

Climate change policies are mainstreamed across multiple agencies and implementing partners (Korovulavula 2016), reflecting both the strengths and weaknesses of Fiji's climate change framework. The government's Climate Change Unit has been established as a lead agency, 'responsible for financial, accounting and technical arrangements, including reporting' (Kumar 2015), but responsibility is fractured across a number of different agencies. Policies are implemented through training and education programmes in communities, and community disaster and emergency plans. Specific relocation training appears to have been more ad hoc compared with disaster risk reduction and climate change training. NGO and government employees who were interviewed for this research said that organisations have been requested to discuss relocation with villagers, though little attention was given to the topic prior to TCW.

2.5 Relocations in Fiji

Three complete, and several partial, village relocations have taken place under this framework (COP 23 2017). Publicly available literature on the relocations is limited, though there has been growing interest in the unfolding situation relating in Fiji, and in recent years has corresponded with a growth in literature on the subject (McMichael and Katonivualiku 2019; Bertana 2019; Charan et al. 2017; Barnett and McMichael 2018). Two examples of studied relocations are Vunidogoloa village on Vanua Levu (Charan et al. 2017; Mcnamara and Des Combes 2015) and the ongoing relocation of Narikoso in Kadavu Province (Bertana 2019; Barnett and McMichael 2018).

These communities underwent years of relocation planning when the villages became uninhabitable due to rising sea levels damaging housing and crops. Earlier adaptation strategies, such as building a sea wall and raising houses on stilts, had been ineffective (Mcnamara and Des Combes 2015; Kumar 2015). Prior consultations aimed to ensure that social and cultural sensitivities were respected and that livelihood restoration work took place (Kumar 2015). However, some dissatisfaction remains in the community, as some of the planning was not thorough enough (Rika 2017) and environmental damage and lack of careful planning have been major failures in the Narikoso relocation (Bertana 2019). The total cost of the Vunidogoloa relocation was significant, estimated at Fj\$800,000 (Charan et al. 2017). It is doubtful whether this level of funding, commitment, and engagement from the government will be replicated, unless at least some of the donor funding sought at COP23 is forthcoming.

3 Method

Research was conducted in collaboration with the Institute of Applied Science (IAS) at the University of the South Pacific (USP), who were working in Ra Province at the time, as part of the Restoration of Ecosystem Services and Adaptation to Climate Change (RESCCUE) project. RESCCUE is coordinated by the Pacific Community (SPC) to improve resilience through integrated coastal management and adaptation measures (Pacific Community 2017). The research was conducted in adherence with human research ethics approvals from both ANU (2017/201) and USP (Alexandra Nichols/2017/).

The two villages, Nabukadra and Navuniivi, were selected for this research and held in conjunction with IAS community waste management workshops in August 2017. According to residents at each site, both villages were assessed for vulnerability by the government following TCW. Research in the communities was conducted through semi-structured interviews in English or with an IAS staff member acting as interpreter (Appendix A1 contains sample questions which were the basis of interviews). Community volunteers were selected from workshop groups to participate in interviews.

There were 13 interviews in total. In Nabukadra, five people were interviewed, but in Navuniivi, only three were interviewed, including two women in each village. The difference in participant numbers was due to the complexity of issues discussed in Nabukadra and time constraints in Navuniivi and because Navuniivi village is not considering relocating. Further interviews took place in Suva, with one Nabukadra resident living in Suva, three government officials from relevant agencies, and an NGO worker. Interviewees are anonymous in this research. Interviews were transcribed by the author and key responses were manually sorted against issues arising in this research. Observations about the two villages were recorded over 2 days spent in each site in August 2017, as well as through discussions with staff from IAS.

4 Research sites

4.1 Geography

Viti Levu is the largest island in Fiji and is home to about 580,000 people, i.e. 70% of Fiji's total population. The two research sites, Nabukadra and Navuniivi villages, are located approximately 30 km apart in Ra Province in the northeast of Viti Levu (see map, Fig. 1a).

Fig. 1 **a** Location of the research sites on Viti Levu, Fiji (courtesy of Clive Hilliker, ANU). **b** Aerial view of Nabukadra village and surroundings (Google Earth). The outlying ‘settlement’ can be seen at the bottom left of the image

Different topographies influence the villages’ vulnerability to climate change and the adaptation measures in place. Community perceptions of climate change and natural disasters are similar; however, differences in physical location, local leadership, and socioeconomic conditions influence the villages’ disaster recovery and adaptation efforts.

Nabukadra is low-lying and located directly on the coastline (see Fig. 1b). The site was expanded in 1985 by reclaiming mangroves; at around the same time, a sea wall was built to protect the village at high tide. There is a little remnant mangrove, making the village more vulnerable to storms, though a reef close to shore protects the village from the worst impacts of storms (Korovulavula 2016). A system of drains in the village disperses pressure from high tides and clears wastewater from the village, as can be seen in Fig. 2a. The village is surrounded by steep, rocky hills which open to a mango plantation on the plateau. The *mataqali* (traditional clan) lands stretch up the hills to the east of the village and along a creek toward the hills and mountains in the southeast, where a small settlement and agricultural land is situated.

Nabukadra village has a population of approximately 90 in 54 houses (Partnerships in Community Development Fiji (PCDF) 2016). Despite access to markets in Rakiraki and Suva via a daily bus service, the poor quality of the unsealed access road makes this village relatively isolated. Several residents of Nabukadra, including some of those interviewed, reside elsewhere for employment but maintain houses in the village.

In contrast, the second site, Navuniivi, is located approximately 50 m from the coastline in Viti Levu Bay. It is higher on a hillside, as indicated in Fig. 2b, and is larger than Nabukadra, which is comprised of approximately 61 houses. A buffer of vegetation including the remnant mangrove lies between the coastline and the village, providing protection from storm surge.

The main town of Rakiraki and the Ra provincial offices are easily accessed via the sea across Viti Levu Bay, whereas the main road to this village is long and winding. The better access to markets and schools might account for a perceived improvement in socioeconomic conditions in Navuniivi as compared with Nabukadra, as indicated by a larger community hall and other buildings. The village headman holds an important provincial government position, and the head of the women’s committee is district women’s committee president, displaying strong village leadership.

Fig. 2 Photos of part of the two villages studied. **a** Nabukadra. **b** Navuniivi. Note how the houses in Navuniivi are on raised ground, whereas many of those in Nabukadra directly abut the low-level drain (waterway) and are close to the sea

4.2 Impacts of Cyclone Winston

The two villages were in the direct path of TCW. The category 5 storm hit Fiji on 20 February 2016 and was the strongest cyclone on record in the southern hemisphere, with wind gusts peaking at 306 km/h (Government of Fiji 2016). TCW caused an extensive damage across the east of Fiji and 44 people were killed (Government of Fiji 2016). The storm surges damaged infrastructure and vegetation and caused coastal erosion.

Both villages experienced a severe damage from the storm. Only four houses in Nabukadra and around 20 in Navuniivi remained. Those which were not destroyed sustained loss of roofing, smashed windows, or damaged walls. Both villages lost their churches entirely; community halls in both villages were still standing but roofing was damaged. Widespread loss of crops, damage to water sources, and inability to easily access agricultural land meant that food and water was scarce after the cyclone.

Navuniivi has not been identified by government assessments or the community as requiring relocation due to its relatively safe location, as indicated in Fig. 2b.

Due to Nabukadra's proximity to the sea, the village experienced twofold damage from the storm surges and cyclone winds. The storm surges caused flooding approximately a metre deep inside buildings, most of which lie close to the drains (waterways) (Fig. 2a). Among the many buildings flooded were the village hall and the headman's house, where most residents sheltered during the storm. At the time of research, recovery efforts were ongoing. Both villages had received part of the government-supplied material assistance in that same week, 18 months after TCW. Interviews with residents indicated that lengthy delays in receiving building materials were due to overwhelming demand on supply chains following TCW. Some residents were frustrated by the delay, but in general understood resource limitations.

5 Findings

5.1 Climate change impacts

Participants at both sites were aware of climate change and could point to specific impacts on their local area consistent with wider research on impacts on small island developing states, including sea-level rise, droughts, coastal and hillside erosion, and ocean acidification

(Korovulavula 2016). Participants did not comment on the connection between TCW and climate change; rather, they focused on perceived gradual environmental changes over time.

Several participants, from both villages, noted that the high tide level has risen in the last 10–15 years and can be especially destructive during king tides. Nabukadra was described as ‘sinking’ by one resident, who also said that during king tides, water flows over the drainage system and into the village, and that ‘before the tides didn’t come as far as they do now’. Infrastructure in Nabukadra has been impacted as the tides bring water as far as the foundations of some houses.

In Navuniivi, the impact of sea-level rise is less dramatic. Coconut trees on the shoreline have been swept away, and the roots of a larger tree are exposed from erosion. One participant in Navuniivi was grateful for their houses built higher on the hillside, noting that if the sea continues to rise, there is a buffer between the sea and village infrastructure.

Participants noted more intense droughts, and the change in water flows means that people cannot fish in local creeks any longer. Fish stocks have changed in the oceans (a conclusion echoed in interviews) due to ocean acidification from climate change, over-fishing, or wastewater draining directly into the bay near the village (Korovulavula 2016). Previously, according to one Navuniivi resident, fishermen ‘brought big fish. Now it’s really hard to get fish here. Before they could go down just there, but now when they fish there they bring back nothing’ and fish caught in deeper waters are not recognised: ‘what is this fish?... all I know the fish [is] from the deep sea.’

5.2 Climate change adaptation and disaster preparedness

Participants expressed the importance of a range of adaptation measures to protect the villages from climate change and natural disasters, and emphasised implementation of alternative adaptation measures before relocation was considered. Favoured adaptation measures ranged from costly engineering proposals to environmental or natural ecosystem-based measures.

One Navuniivi resident replied when asked about relocation, ‘we feel safe and we are far from the sea. No need to move elsewhere.’ Navuniivi residents have instead focused on other adaptation measures, such as vegetating the coastline, renovating the evacuation centre, and demarcating village boundaries to prevent any future construction of houses in the high-risk area closer to the sea.

Both villages are interested in building, or reinforcing, sea walls to protect infrastructure and vegetation. Sea walls in either village would require a substantial investment from a partner agency to assist with cost, materials, and expertise. Nabukadra has requested earth moving machinery to counter erosion behind the existing sea wall (Bolatiki 2016). Few natural defences exist for Nabukadra, but in Navuniivi, residents have planted coastal trees and grasses in the existing vegetated buffer zone.

Evacuation centres, and disaster and emergency plans, are key priorities. Both villages have disaster and emergency committees which oversee planning and evacuation routes, but prior to TCW, neither village had a suitable evacuation centre. Since 2014, Nabukadra had planned to build an evacuation centre on the hillside adjacent to the main village, though the plan has stalled because of the urgent need to rebuild housing and the lack of available, cleared land on the chosen site. Navuniivi is better prepared for future emergencies, as the village was able to convert the lower ground level of the two-storey community hall, which previously housed the community kitchens, into an evacuation

centre. With the assistance of materials and training from NGOs, new houses are built to a higher standard than prior to the cyclone, with specialised bolts to hold the roofing down, and some houses which are still standing have been strengthened to withstand winds. Participants in both villages noted the importance of training to prepare for future emergency situations and for awareness of the impacts of climate change to develop their own local adaptation strategies.

At the time of research, the vast majority of infrastructure in Nabukadra and Navuniivi was in the same location as before TCW. Change has been small scale and focused on rebuilding to a stronger standard rather than relocation.

5.3 Nabukadra: relocation drivers and barriers

Nabukadra was identified by the government as one of the 42 candidate villages for relocation. The government's willingness to support the process is the principal driver for the village considering relocation. Prime Minister Bainimarama visited Nabukadra shortly after the cyclone and pledged assistance in the effort to rebuild, saying it is 'easier and cheaper for the Government to relocate coastline villages' over other adaptation measures like reclaiming land (Nasiko 2016).

Despite initial support, barriers to relocation arose. Nabukadra village identified two possible relocation sites during vulnerability assessments. The closer of the two, on the hillside adjacent to the village where the evacuation centre was planned, was agreed on and approved through official and cultural processes. Steep terrain and density of vegetation, as well as a mango tree plantation, require heavy machinery to clear and level the site.

An alternate site was also identified, a few hundred metres southwest from the main village, where the settlement is located. After TCW, a small number of residents independently relocated to the settlement; however, one resident said that land owners did not give permission for the entire village to relocate to the settlement, as agricultural land would be compromised and for cultural reasons. Those who did relocate independently to the settlement are members of the same clan or members of the same religion and had separated themselves from the main village to observe their Sabbath. Unlike the experiences documented in Narikoso village, the relocation of some Nabukadra residents to the settlement site did not itself appear to cause major divisions in the community as a whole (Barnett and McMichael 2018; Bertana 2019).

That said, despite having identified the hillside relocation site for the remainder of the community to move to, a protracted and fractured decision-making process ensued. Residents who supported the move to the new location wanted to do so because of the relative safety in the new location and perceived benefits outweighing the costs. Reasons against the relocation are varied. One participant alluded to a tension between the clan owners of the new site and that of the existing village. Cultural and social reasons were also provided, as ancestral graves and *yavu* (ancestral foundations of their homes, or house mounds) are on the existing site. Older people were less likely to want to move for those cultural reasons, and more practically because of the inability to walk uphill, similar to research in other Fiji communities (McMichael and Katonivualiku 2019). The cost of rebuilding elsewhere was also cited. One participant strongly believed in the resilience of the community and that they had 'many cyclones and the place has remained stable' and that he was 'confident' the village could remain where it is located.

An eventual lack of investment from any implementing partner has meant that at the time of research, few houses had moved. Rebuilding took place slightly uphill only where the land could be cleared by hand and was levelled enough to build on, within the existing boundaries of the village. The residents had little choice of where to rebuild. One resident explained:

They agreed to build toward the hills, but no one has cleared it, so it means you can't go there. You need some earthworks. People build where it is easier to build. To build up on the slope it requires machines to clear, that is why no one has built there.... Nothing has happened, but it needs to be cleared for people to build on the hill.... But it is not cleared. It's a problem.

6 Discussion

6.1 Roles and decision-making

Any relocation of a village requires input from the state and the community. Governments provide legal and governance support, coordination, and support by building major infrastructure, and funding unless it can be provided by a third party. Recognising this role, the Fiji Government is making efforts to coordinate institutions and develop policy, and a balance between community-led decision-making and leadership from the government is needed. The Nabukadra case shows that while communal participatory decision-making is often a strength of Fijian villages, the relocation discussions were 'sensitive' and protracted and caused division in the community, as described by residents. This was also the case in Vunidogoloa and Narikoso (Rika 2017; Bertana 2019; Barnett and McMichael 2018). The decision in Nabukadra has never truly been resolved.

In order to achieve results, the government could 'incentivise or compel' relocation where it sees relocation as essential for sustainability (Hino et al. 2017), though it is unlikely that the Fiji Government will compel Nabukadra to relocate. Nabukadra is not yet uninhabitable, and in situ adaptation is often preferable for residents in the face of the uncertainties associated with climate change (Jamero et al. 2017; McMichael and Katonivualiku 2019). Furthermore, 'bottom-up' voluntary community processes are important to the Fiji Government as a fundamental principle of the relocation guidelines (Government of Fiji 2018, p. 8). The Natural Disaster Management Minister has said 'usually in relocation process, the approval has to be from the communities, they have to indicate that they are willing to relocate' (Swami 2016). Smaller-scale incentives could be introduced, such as funding assistance tied to the location in which the new house is being built, though existing resourcing constraints would make this difficult to implement and may undermine the community's capacity to make its own decisions.

The model developed by Hino et al. (2017), outlined in Appendix A2, can cast light on the complex interplay between social, cultural, political, and economic factors which inform decision-making in relocation (Fig. 3). The model is premised on two factors: that two parties must be involved (the community itself and an implementing partner or agency such as the government) and that the community must have geographically moved and given up land at one point.

Fig. 3 Conceptual model representing community and implementing partner perspectives on relocation. Reprinted with permission from Nature Climate Change[®] (Hino et al. 2017)

Over time, the willingness or ability of the state to support Nabukadra's relocation has changed. As discussed in Appendix A2, without government assistance, residents of Nabukadra have fallen into the *hunkered down* quadrant in the conceptual model of Hino et al. (2017), where costs exceed benefits to the state, or into the *self-reliant* quadrant. The community is already highly self-reliant as construction and other decisions are driven from within the village. Empowering the community within this *self-reliant* quadrant might enable leadership to approach donors, private enterprise, or other agencies for assistance. If a plan is in place, donors will be more likely to assist.

6.2 Competing adaptation strategies

The costs and benefits of in situ investments in climate adaptation measures, as opposed to relocating, need to be explored. Both villages expressed interest in building a sea wall, and in Nabukadra, modelling and assessments of the current site could help to inform whether a sea wall would be a worthwhile investment in the face of rising sea levels. Although building a sea wall is often one of the first adaptation measures to be contemplated by vulnerable coastal communities, it is well known that such sea walls are often ineffective (Bolatiki 2016). In many cases, therefore, resources could be better used in relocating housing to safer ground, but this may not be the preference of the residents themselves. Pre-emptive moves are difficult to justify and conceptualise where the existential threats of sea-level rise are still relatively abstract in the minds of residents, despite the evidence of rising sea waters within the village, and it is impossible to speculate the true extent of climate impacts on the village (McMichael and Katonivualiku 2019).

Another risk is that residents may be less willing to relocate later if they have made large investments into adaptation measures to stay in place, known as the 'levee effect' (Hino et al. 2017), and this can occur if assistance is piecemeal and uncoordinated.

Following TCW, houses are built to a higher standard, even if still located in a vulnerable position. Due to the additional investment and time taken to rebuild, people will be unwilling to relocate for some time.

6.3 Timing and timeframes

On the one hand, TCW has frustrated progress on relocations and planning, but on the other hand, it has also been a catalyst for action. Longer-term climate change planning, especially in Nabukadra, has been bypassed to rebuild in the immediate aftermath of TCW. People and resources were diverted from community development initiatives and disaster risk reduction plans to meet immediate needs of the village in the reconstruction efforts.

From a policy perspective, this highlights the difficulties in planning in the long term. Vulnerability assessments, conversations about relocation, and demarcating village boundaries were slowly taking place, but a push for completion took place only after TCW. Critics say that the government was too hasty in conducting the vulnerability assessments and relocation was encouraged without long-term planning and resources in place. In reality, prior to TCW, 48 villages were approached to relocate but many refused. For those who agreed, they ‘did not actually relocate until they felt the brunt of severe TC Winston’ (Nasiko 2016). TCW provided an opportunity for some villagers to relocate, as articulated by one participant:

There are these precautionary plans, but then the impact occurred before those plans were implemented. In a way, the cyclone decides for people. Once their houses are gone, then it just makes sense if you’re going to rebuild, that you might as well rebuild on higher ground.

An emphasis could be placed on a phased approach where there is no immediate threat to a village, but longer-term sustainability would be achieved with relocation. Where plans had been in place but not acted upon earlier, some residents took the opportunity to rebuild where they had intended, as exemplified where residents moved to the settlement outside Nabukadra.

A final point on timing is that failure to act early means a window of opportunity to rebuild in a safer location has closed. Without cleared land in an appropriate site, most Nabukadra residents were resigned to building their houses in the old location.

6.4 Development

The difference in circumstances between the two villages means that Navuniivi is in a better position to pursue the goals of future development and emergency management—goals which are common in Fijian villages generally. Navuniivi is in a safer physical location and does not have the same stressors as Nabukadra. Navuniivi residents can therefore focus attention elsewhere, including on income generation. Nabukadra could be in a cycle of poor development. The village is still in the same vulnerable location, without an appropriate evacuation centre if there is another cyclone, and it continues to be vulnerable to longer-term effects of climate change. Relocation would ideally provide a development opportunity for Nabukadra (Rika 2017).

7 Conclusions

A community relocation can be considered successful if it fulfils the conditions in the Fiji guidelines quoted above, namely, that the community has moved to ‘a suitable location, away from risk-prone areas, where they can enjoy the full spectrum of rights including housing, land and property rights and all other livelihood and related rights’ (Government of Fiji 2018, p. 6). Establishing the conditions under which a successful relocation will take place is complex. These two case studies provide a comparison of the stresses that are placed on a community at a higher risk of climate change and natural hazards, which has the potential to relocate, and another which is already in a safer position.

Conceptually, this research refers to two types of decision-making processes for relocation: those which happen pre-emptively due to longer-term climate changes and those which are urgent in response to disaster (UNHCR 2017). While longer-term planning before a location becomes untenable is desirable, this research shows that a trigger event, such as TCW, may be the proximate cause of relocation. Both pre-emptive and responsive decision-makings bear substantial risks and planning for one cannot take place in isolation of the other. Notwithstanding the merit in planning relocation before a location becomes uninhabitable, a disaster like TCW can provide the necessary impetus for a community to make the decision to relocate. It is difficult to establish the timing, cause, and threshold of willingness to stay in one location, where communities are impacted by the effects of slower-onset environmental changes from climate change (McMichael and Katonivualiku 2019).

Although Navuniivi was much damaged by TCW, and its inhabitants are generally well aware of the previous and potential impacts of climate change, that community considers that its present location renders it safe from such impacts (apart from direct impact by a strong cyclone, which is rare). Therefore, the community of Navuniivi sees no need to relocate in the next several decades, a view shared by the Fiji Government.

The case of Nabukadra demonstrates that relocations take place only as a last resort: the village is a prime candidate for relocation; however, while some were in favour of proactive relocation, others are intent on remaining. It appears that at some time in the future, Nabukadra will no longer be an inhabitable location due to rising sea levels, but it is not a current emergency. However, until that point is reached, and without government intervention, there is no pressing need to relocate. Residents display resilience in making incremental changes where necessary (Jamero et al. 2017), and social and cultural concepts, including a sense of place, complicate decisions (McMichael and Katonivualiku 2019).

In order for relocation to be successful, decisions must be made by both government and communities, with support, where required from a third party (Hino et al. 2017). Unlike other relocation projects in Fiji, Nabukadra did not approach the Fiji Government for assistance to relocate; rather, the conversation was prompted by the government following TCW, which might reflect the community’s own lack of sense of urgency to relocate prior to the cyclone (McMichael and Katonivualiku 2019). The Fiji Government is showing support for relocations; however, the Nabukadra relocation, once decided on, was unsuccessful when practical support was not provided. The case is an example of the necessity of the investment and timeliness of assistance from an implementing partner, for the success of adaptation and relocation. Third-party agencies could provide technical expertise or funding where government resources are limited, for example the role of the German Development Fund GIZ in the Narikoso relocation (Barnett and McMichael 2018). Delays in assistance following TCW

highlight resource constraints in small island developing states, and have a major impact when the community wants to relocate (Bertana 2019).

Most residents of the villages were aware of climate change and relocation, but there were knowledge gaps, such as the expected height of storm surge during a cyclone as powerful as TCW and the potential extent to the damage. Training and education can empower communities to be more self-reliant and to identify the risks and local remedies within their own communities, such as appropriate evacuation locations.

Whole of community relocations (like Vunidogoloa) are costly and difficult to implement, but with proper planning and smaller-scale, incremental process, Nabukadra could plan to relocate over a generation. It is evident from this research, supported by the findings of McMichael and Katonivaliku (2019), that relocations are unique to the circumstances of the community. A phased approach may be more appropriate as the residents deem relocation necessary over time. Relocation of Nabukadra could be part of an integrated coastal management plan, taking into consideration other adaptation options. Planning in any case is essential to avoid potential maladaptation, loss, and damage to culture, livelihoods, and social networks, and in order to achieve long-term sustainability (Mcnamara et al. 2018).

Relocations due to climate change are complex, and at times paradoxical, with a number of interconnected drivers at play within the community, among policies, and between the community and implementing partners (Oakes 2019). Without collective willingness to relocate, then, divisions can grow in the community (Barnett and McMichael 2018). It is difficult to pinpoint the exact conditions under which a successful relocation will take place, though it is evident that a cohesive and willing community, strong leadership within the community, and a supportive, well-resourced implementing partner are essential (Hino et al. 2017). It is easier to point to where failings have taken place where the community has not relocated, but the lessons learnt from these two case studies assist in designing more effective policy for future relocations.

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