

# Building Disaster Resilience with Indigenous Knowledge in Rural Fiji

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**Pacific islands are widely recognized to be vulnerable to natural hazards due to its location and characteristics as small island states. Despite this, the communities have survived the recurrent natural hazards and have accumulated the extensive knowledge and experience to cope with them. Although the benefits of indigenous knowledge within disaster risk reduction are begun to be recognized, only a few researches is available. This paper takes up the issue of housings which are frequently damaged or destroyed by the seasonal cyclones and understand the indigenous knowledge associated with them in rural Fiji in a holistic way.**

**Keywords:** Disaster Resilience, Indigenous Knowledge, Traditional Housing, Cyclone, Fiji

## 1. INTRODUCTION

Pacific islands are widely recognized to be vulnerable to natural hazards due to its location and characteristics as small island states. Despite this, the communities have survived the recurrent natural hazards prior to the European contact by their own and have accumulated the extensive knowledge and experience to cope with them [1]. Nevertheless, colonialism and the provision of disaster relief in the last century resulted in the loss of the knowledge and increased in dependency.

The recent increase in recognition of the potential of indigenous knowledge for disaster risk reduction in the Pacific islands, but there are only a limited number of researches on how to identify and utilize them in modern context. This paper takes up the issue of housings which are frequently damaged or destroyed by the seasonal cyclones and understand the indigenous knowledge associated with the traditional housings and the building process in rural Fiji in a holistic way.

## 2. DISASTER RESILIENCE AND INDIGENOUS KNOWLEDGE

Over the past ten years, increased attention has been paid to the capacity of affected communities; what they can do for themselves with little or no external assistance. This brings the concept of resilience rather than just need or vulnerability to the work on disasters.

As Manyena proposes 'disaster resilience' program is to enhance the fundamental values, assets and resources that can be applied to the process of adapting to adverse circumstances [2].

Such assets and resources embedded in local communities can be referred to as indigenous knowledge which demonstrates a considerable knowledge of, and sympathy with, the environment [3]. Indigenous knowledge existing within and acquired by the local people over the time is considered to have context-dependent, holistic and constantly changing nature.

Campbell and Veitayaki suggests that there were a wide range of knowledge and practices that helped the communities to reduce the negative impacts of natural hazards though these may not have been emerged simply as a response to environmental extreme. These includes production of food surplus, food preservation and storage techniques, maintenance of resilient agro-ecosystems, the use of famine food, form of cooperation among community members, inter-community interactions and wind-resistant building structures.

The disaster-related literature on traditional housings is often limited to the structural safety features of the buildings both within and beyond the Pacific. Some available studies in architecture or anthropology on traditional housings, often referred to as vernacular housings, have expressed their relationship with the various factors such as climate conditions, socio-cultural influences, craftsmanship, the potentiality of natural materials, and the complex interactions of such factors [4]. This suggests a need for a holistic view to exploring the potentiality of traditional housings for the disaster resilience.

## 3. CYCLONE IMPACTS ON RURAL FIJI

The Republic of Fiji Islands (Fiji) is one of the Melanesian countries located in the South Pacific. The county, which has an area of 18,333 km<sup>2</sup> and a population of 837,271, consists of approximately 330 islands, of which about 110 are inhabited. Two major islands, Viti Levu and Vanua Levu, account for 80 percent of the nation land and have 87 percent of the total population. While urban population continues to

increase, nearly half of the population still lives based on subsistence farming in rural areas.

Among all natural hazards affecting on Fiji, cyclones are considered as the most hazardous kinds. Since the beginning of the 20<sup>th</sup> century, nearly 140 tropical cyclones have landed on Fiji and some of them caused extensive damages mainly on agriculture, housings, and infrastructures (Table 1). Housings especially in rural areas are subject to damage or destroy from the cyclones due to the inadequacy of the material use and/or the structure. For example, the number of damaged and destroyed housings by the Tropical cyclone Tomas in 2010 is 998 and 959 respectively.

TC Name Cost in FJD	TC Ami (2003)	TC Cliff (2004)	TC Daman, (2007)	TC Gene (2007)	TC Mick (2009)	TC Tomas, (2010)
Agriculture	40,330,619	4,771,343	104,671	25,144,394	32,433,606	48,955,695
Sugar	13,600,000	N/A	N/A	N/A	367,020	3,300,000
Housing	22,089,200	703,974	237,485	5,187,615	19,890,500	10,207,001
Education	4,770,635	73,948	149,195	621,155	1,330,915	4,052,517
Health	857,000	0	900	1,651,220	130,430	1,363,400
Infrastructure	5,792,435	3,386,860	N/A	13,340,000	2,877,302	14,150,787
Utilities	4,580,400	27,081	8,000	6,401,500	971,000	1,794,400

**Table 1.** Summary of major damages by the recent tropical cyclones (TC) (compiled by the author)

Along with the structural vulnerability of housings, housing reconstruction is a big challenge. An assessment conducted after six months from a cyclone shows that the majority of damaged housings in rural areas are not repaired or reconstructed. In addition to lack of financial resources of rural people, it is noted that a long history of provision of housings by external agencies after disasters has discouraged them to reconstruct their housings by their own. In the light of resilience, reviving indigenous knowledge associated with traditional house building may suggest an option to enhance capacity to restore the living environment because they could be built quickly with the locally available materials without costing much.

#### 4. POTENTIAL OF INDIGENOUS KNOWLEDGE: TRADITIONAL HOUSE BUILDING

Although it is still acknowledged that traditional housings are suited to its tropical climate and their culture by the indigenous Fijians, there is hardly any existing even in the remote villages as a result of the modernization and the change in the lifestyle in the last few decades. In order to understand the indigenous knowledge associated with the traditional housings and house building process and identify the potentiality to utilize them in modern context, surveys are conducted in three villages in Viti Levu with traditional housings, Nataleira, Dama, and Navala, and model building project are carried out in cooperation with Centre of Appropriate Technology (CATD) and Development and Cautata village.

The study reveals that traditional house building is still based on the various resources available within the village at present days. The materials used for the housings vary depending on villages due to the

availability of the plants (Talbe 2). Skills and techniques are delivered by the village elderlies who had acquired the experience of traditional house buildings in their early days. The younger ones in the village participate in the house building and provide the workforce as a part of required communal work of their village or their extended family. Traditional house building still deeply relates to traditional land tenure, natural resource management, and communal work system which rooted in the concept of *vanua* which encompasses a number of inter-related meanings among people, land and customs for indigenous Fijians who are often defined through their lands.

Village name	Nataleira	Dama	Navala	Cautata
Main columns	bishopwood <i>koka</i>	bishopwood <i>koka</i>	ipil <i>vesi</i>	mangrove <i>selala</i>
Main beams	palm tree <i>niu</i>	ylang-ylang <i>mokosoi</i>	buckthorn <i>doi</i>	mangrove <i>selala</i>
Roofing cover	reed <i>gasau</i>	reed <i>gasau</i>	reed <i>gasau</i>	reed <i>gasau</i>
Wall cover	reed	(in) reed (out) grass	(in) bamboo, reed (out) grass	(in) reed (out) <i>makita</i>

**Table 2.** Examples of plants used for traditional house buildings (in English and in *Fijian*)



**Fig 1.** Traditional housings in Navala (left) and model building at CATD (right)

Despite the fact that they hardly exist, it uncovers the existence of underlying resources necessary for the traditional house building including natural resources, people with skills and experiences, and communal work system. This also suggests that reviving indigenous knowledge which contributes to resilience can only be achieved through the recognition of its benefits by the local people in a culturally compatible and sustainable manner.

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