



Resilience with Bamboo Development in Rural Communities of Fiji Series: Tai Vugalei- Tailevu

VILIAME KASANAWAQA SAIRUSI BOSENAQALI RUDOLPH EVANS AMELIA RARATABU

Beyond the Bilibili Inc.

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This is the first publication in a series, looking at bamboo development and resilience building in Small Island Developing States.



Figure 1: Canoe with components of Bamboo in Guam. Source: Author

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Introduction and Background

Economic growth and employment creation are hampered in the Pacific Small Island Developing States (PSIDS) by narrow domestic markets and natural resource bases, while social fragility is affected by high population growth and geographical dispersion (Briguglio, 1995). The impact of the climate emergency is being felt most severely in these small island states, where in some cases a single climatic event is able to wipe off a third of a country's GDP (Kasanawaqa V., 2024)¹. These are challenging issues that are viewed

as unsolvable in the islands. National governments' capacity to confront and resolve these challenges is further constrained in a setting with limited specialized knowledge and financial resources (Kasanawaqa, 2022). A green recovery (GR) pathway is an emerging theme in the planning to rebuild post the pandemic for SIDS (Foley, et al., 2022) and the global community. This pathway is centered on the green economy (Asian Development Bank, 2018). However, despite the optimism associated with Green Recovery, little is known on how it will be realized in different places, and how politics and power shape the recovery efforts in different economies (Kasanawaqa, 2022).

Environmental risks include extreme weather events, sea level rise, and habitat degradation, making PSIDS susceptible to natural hazards (Kasanawaqa V. , 2024). The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) described the Pacific Island countries' disaster risk landscape as 'being reshaped by cascading and converging hazards under a new disaster-climate-health nexus and increasing vulnerability of populations to cascading hazards.' Because to the number of individuals affected by catastrophes per capita, the region is frequently ranked among the most disaster-impacted places in the world. The region also suffers significant economic losses and costs as a result of calamities. Annual economic damages from climate-related disasters are expected to reach US\$1.075 billion, or 5% of the combined GDP of Pacific SIDS. Losses are particularly severe in Palau, Tonga, and Vanuatu, where average annual losses (AAL) are 11.98%, 19.20%, and 20.67% of national GDP, respectively (UNESCAP, 2022, p. 2).

The recent external shocks experienced by communities in Fiji, in particular the COVID19 Pandemic required inhabitants of the Islands to revert back to traditional knowledge and practices that have sustained them for thousands of years (Kasanawaqa V., 2024). Modern research points to that island populations and their social beliefs and methods have demonstrated to promote the islanders staying strong to peripheral shocks. It has been discovered that groups can evolve a variety of coping mechanisms to deal with external shocks throughout thousands of years of effective isolation on relatively small, isolated land areas in the middle of the earth's oceans (McNamara & Prasad, 2014).

Bamboo Development a Green Economy Tool for the Implementation of the Sustainable Development Goals on Islands

On 27 October 2020, diplomats and policymakers came together to celebrate the Republic of Fiji's accession to INBAR - the International Network for Bamboo and Rattan, at a flag-raising ceremony outside the Organization's Headquarters in Beijing. The event was well attended, with representatives from INBAR Member States and other Pacific countries, as well as from INBAR's host country, China (Fiji Times, 2020).

¹ For example, Cyclone Pam in Vanuatu and Cyclone Winston in Fiji wiped out 65% and 33% of Gross Domestic Product, respectively. More specifically, in the case of Vanuatu, a generation of development gains was lost in a matter of mere hours. Experiences like these, as well as with Cyclone Gita in Samoa and Tonga, have reinforced the view that building resilience to climate change and reducing the impacts of disasters from natural hazard risks are real and present challenges for Pacific Island Countries.

Bamboo is a key part of life and culture for Fiji and many other Pacific Island states and has been used for



Figure 2: Wares made by the participants on display on the final day session. Source: Author

(International Bamboo and Rattan Organization, 2017).

centuries for a wide range of purposes, including construction, rafts, and fishing traps. The current efforts and initiative by Beyond the Bilibili are to help revive these many traditional sustainable practices and weave the current proven science in building resiliency in communities in the social, environmental and economic pillar. Bamboo can help contribute to the country's work of combating deforestation, climate change and unemployment.

Fiji's Bamboo Industry at its full potential can contribute towards the achievement of Fiji's Sustainable Development Goals (SDGs) particularly SDG 4 Quality education, SDG 7 Affordable and Clean Energy SDG 8 Decent work and economic growth, SDG 9 Industry innovation and infrastructure, SDG 11 Sustainable cities and communities, SDG 12 Responsible consumption and production, SDG 13 Climate action, SDG 15 Life on land, and SDG 17 Partnerships for the Goals. It will most probably also contribute to SDG 1 No poverty and SDG 2 Zero hunger

The untapped potential of Bamboo is still not widely recognized in Fiji, unlike in Asia and South America, where the uses and versatility of bamboo is substantive and as such, thriving with great success. The current efforts by the Ministry together with Beyond the Bilibili and other stakeholders is to promote, revitalize and fully develop Bamboo so that its potential and benefits could be fully realized for socio-economic growth.

Thesis of Progress

Bamboo is an agriculture and forestry crop, its stands are recognized as forests and can easily integrate with agriculture, shelterbelts, boundary planting, and homesteads. The intervention piloted solutions addressing challenges of food security, land degradation, lack of economic opportunities and cost-effective resilient infrastructure in rural communities. Recent studies undertaken on agro-forestry, climate change and post climate disaster recovery validate the premise that bamboo agroforestry improves climate resilience. Studies on bamboo agro-forestry (Sopacua, Wijayanto, & Wirnas, 2021) in Ghana, India, and Ethiopia have demonstrated bamboo's potential for Climate Change resilience as well as improving the socio-economic conditions (Jinger, et al., 2022).



Figure 3: Seminar Presentation as part of Workshop Series. Source: Author

Bamboo could become an important non-timber forest resource in Fiji and also in other neighboring small island states in the Pacific. There have been several development efforts for promoting bamboo as a nature-based solution for climate change mitigation and adaption, livelihood development environmental and management. Considering the potential of bamboo, Fiji became a member country of INBAR in September 2020. The Ministry of Forestry is the focal point of INBAR. INBAR hosted the delegation of highlevel officials and key bamboo sector stakeholders in China. Moreover,

INBAR co-hosted a side event with the Government of Fiji at UNFCCC COP23 (Bamboo for climate change action in small island development states) (International Bamboo and Rattan Organization, 2017). Fiji has formulated numerous guiding policies, strategies and action plans for developing a low carbon climate resilient future. The most important among them are the National Climate Change Policy 2018 – 2030, National Adaptation Plan (NAP) and Low Emission Development Strategy 2018 – 2050 (LEDS) (Kasanawaqa, 2022).

The Ministry of Forestry is conducting skill development training for micro and small enterprises, informal industries for crafts and artifacts production, and efforts are ongoing with various partners to promote bamboo as a wood substitute product. Knowledge products – bamboo strategy and bamboo agribusiness compendium have been developed by the Pacific Agribusiness Research in Development Initiative Phase 2 (2019) with the support of the Fiji Bamboo Association².

In Fiji, a few studies were undertaken on agro-forestry, climate change and post climate disaster recovery and these validate the premise that agroforestry improves climate resilience (Mcguigan, 2022; (McGuigan, Tora, Tikonavuli, & Ticktin, 2024); (Harrison, Ryan, Watmough, & Harrison, 2022)). Studies on bamboo agro-forestry in Ghana, India, Ethiopia and other INBAR member states have demonstrated bamboo's potential for climate change resilience as well as improving the socio-economic conditions (Rao et al., 2018; Anglaaere et al., 2020; Akato et al., 2020; Kittur et al., 2016; Solomon et al., 2021).

Partnership for Delivering Impact

The Ministry of Forestry and partners like Beyond the Bilibili are working to promote and develop bamboo for socio-economic growth. This partnership for impact took its first steps with delivery of a series seminars of Tikina Tai Vugalei from the month of April 2024 to July 2024 with the focus on how bamboo can contribute to the sustainable resilient communities. This knowledge sharing and network building

² PARDI-2- Bamboo-Agribusiness-Compendium -2021.pdf (pacificfarmers.com)

with the resource owners of this Tikina, was aimed at driving transformative change towards green growth and increased resilience.



Figure 4: First Class of the Seminar Series. Source: Author

Tai-Vugalei Project Sites

The district (Tikina), Taivugalei in the northern part of Tailevu is one of the 22 districts of the of the province on Eastern Viti Levu, Fiji. Taivugalei is a remotely rural district bordering the province of Naitasiri and is not accessible by public transport. The district comprises four villages.

Village	Latitude	Longitude
Tonia	17°48′34.40″S	178°22′39.86″E
Vatukarasa	17°49'49.33"S	178°23′8.05″E
Natuva	17°50'59.22"	178°23′43.94″E
Nameka	17°51′0.25″S	178°24′11.89″E

Unlike Tonia village, the biggest and most populated of the four and uniquely identified as the only village with the most indigenous iTaukei dairy farmers in Fiji, the villagers in Vatukarasa, Natuva and Nameka are mostly subsistence farmers whose main produce are taro, cassava and kava. Nameka village, however, has a good quantity of land leased out to the government and utilised for mahogany forest plantations. The district comprises approximately 800 people whose children attend the three local primary schools. The children of the three villages, Natuva, Nameka and Vatukarasa cross or travel upstream the Rewa River to attend Lomaivuna High

School whist the children of Tonia attend Naiyala High School. There are nursing stations located in Tonia village and one in Vatukarasa village and each staffed by a nurse.

Case Study: Awareness Raising Work in Tikina Tai Vugalei

The current efforts by the Ministry Forestry together with its partners like the Beyond the Bilibili and other stakeholders is to promote, revitalize and fully develop Bamboo so that its potential and benefits could be fully realized for socio-economic growth.

Outcomes

This Seminar achieved the following:

- a) Agreed on a work-plan for Tikina Tai-Vugalei activities and Initiatives to progress the Bamboo Development in the District;
- b) Identified funding opportunities for the Bamboo Development and resource mobilization for interventions on the ground, linked to the needs in the Tikina Tai- Vugalei and the neighboring districts and develop a strategy to engage donors for application;
- c) Identified the priorities for initial projects to promote the use of bamboo. Each project will stimulate one or more end uses for bamboo in the Tikina Tai-Vugalei and its neighboring districts;
- In addition to the species, we see growing across Fiji, the seminar also identified other bamboo species that would each have multiple attributes for various end products. The workshop also identified which bamboo species possess the diverse characteristics that will be most useful for the variety of end uses;
- e) Formulated future webinars (Fiji centered) that respond to on the ground needs, inviting government officials and stakeholders to discuss thematic areas with potential in the region. In addition to this, partners will organize capacity building activities such as virtual Training of Trainers;
- f) Developed communications materials and reports, to ensure knowledge sharing and best practices are documented; and
- g) Foster interactive discussions and proposed next steps for bamboo development in Fiji and the Pacific Islands.

Project Opportunities for Scaling Up

There were numerous projects identified during the seminars, but four were identified has having priorities to spur long term socio-economic development for the Tikina, neighboring districts and that can be scaled up, nationally and regionally.

The utilization of Rattan

The village of Natuva presently has an abundance of this species. During the talanoa talks at the workshop, the villagers voiced worry about the issues they have while dealing with the rattan species. It was confirmed that the plant was introduced in the 1990s by the Ministry of Forestry with no current planned usage. It is advised that the International Bamboo and Rattan Organization, of which Fiji is a member, be brought on board to help train people about MSME business potential in the area of rattan product development.



MSME and Cooperative Support

Following the training, the participants in the communities are organizing cooperatives, and one of the most important requirements for starting an MSME is

Figure 5: Intricate weaving of bamboo in the ceiling of a Maneaba in Kiribati. Source: Author

access to craft-making equipment. It is requested that MoF support this ongoing program by considering subsidy grants to newly created cooperatives for equipment support.

Food Security

Component of the training was to demonstrate the preparation and cooking of bamboo shoots. The Bamboo shoots are a common ingredient in many Asian dishes. They're often enjoyed boiled or canned and boast a crisp texture and mild, earthy flavor. Bamboo shoots are highly nutritious and contain a good amount of fiber, copper, and vitamins B6 and E in each serving. The local community can harvest these seasonal shoots and through their cooperative establish supply chain for local restaurants and buyers. It is requested that Ministry of MSME support such ongoing program by providing technical support to the established cooperatives to explore this niche market.

Resilient Public Infrastructure Pilot- Bus Shelter

The combination of cement and bamboo produces disaster-resistant, energy-efficient, and visually attractive structures. Whether it's a single detached house, a two-story residence, or a unique construction, structures built using Cement and Bamboo provide design adaptability while ensuring safety and longevity. This unique technique contributes to worldwide efforts towards sustainable construction by lowering carbon emissions and encouraging alternative building technology. The pilot structure in Tai Vugalei is designed to delve into the world of Cement-Bamboo Frame Structures and investigate how they provide several benefits for various types of building, helping to the achievement of sustainable development goals while avoiding negative environmental impacts.

Conclusion

Economic measures to advance social justice and enhance eco-friendly management can foster long term sustainable development. However, the un-sustainability of pecuniary growth based on standard growth principles has persisted and gained significant traction with the COVID-19 pandemic (Kasanawaqa, 2022).

Pacific island countries and territories with their constituent communities are making efforts to ensure



Figure 6: A small fale made of Bamboo materials in Federated State of Micronesia. Source: Author

there are synergies among a wide range of relevant initiatives in the context of sustainable development. It is becoming imperative for the region to embark on a multiincluding pronged approach, enhancing networks and collaborations with each other and international institutions. Promotion of and development upon harnessing *social capital* as the effective functioning of social groups through interpersonal relationships, a shared sense of identity, a shared understanding, shared norms, shared values, trust, cooperation. and reciprocity. Bamboo Development has shown in this series of seminar in Tikina Tai

Vugalei that it is an effective tool to do just this and operationalize Green Economy on islands to build resilience by reconnecting to traditional wisdom, practices and knowledge base (Ratuva, 2007).

Several opportunities lay ahead to rebuild post-pandemic, aligned with the green economy (Foley, et al., 2022), here with this partnership with the Ministry of Forestry, we are well floated to go Beyond the Bilibili.

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ATTENDANCE LIST

BAMBOO DEVELOPMENT IN RURAL COMMUNITIES

TONIA AWARENESS WORKSHOP, TONIA TAILEVU

- 1. Meli Dautiqa
- 2. Mosese Turaga
- 3. Irami Ceinaturaga
- 4. Rt. Veresa Sorovakarua
- 5. Navitalai Rokotuitai
- 6. Mesake Rawaikela
- 7. Joseva Nasaimalo
- 8. Peni Durukaunia 2
- 9. Meradani Maramanibola
- 10. Siteri Rokoleba
- 11. Arieta Tabua
- 12. Avikali Wati
- 13. Lavenia Uca
- 14. Paulini Ravato
- 15. Ivamere Rokotina
- 16. Panapasa Rokodaivalu
- 17. Pauliasi Ramodo
- 18. Jone Serukalou
- 19. Manoa Rokorasei
- 20. Loata Buakaba
- 21. Tuate Kamawale
- 22. Ruci Yabakidrau
- 23. Sikeli Naivunivuni
- 24. Samisoni Naisua
- 25. Kitione Rokosuka
- 26. Eliki Naikatini
- 27. Viliame Kasanawaqa
- 28. Josua Codra

- 29. Viliame Tukutukumaimuri
- 30. Vilimoni Kilawekana
- 31. Jerry Cole

Participants were able to:

- ✓ identify the local varieties of bamboos
- ✓ identify them by their local and scientific names
- ✓ identify growth cycles of bamboos
- ✓ identify growth patterns
- ✓ identify the characteristics and properties of leaves and stems
- ✓ learn about bamboo propagation
- ✓ learn about bamboo cultivation
- ✓ identify the usages

TESTIMONIALS:

"Apart from the many trainings that we've had in this village, this is the first time that we're having a bamboo awareness like this one. It's been a very long time now that we have ceased using bamboo. We're fortunate, for some of us who are in this training, I can say that we are fortunate because we have come to realise that this resource was supposed to have been useful to us but it has not. Those who are not here are unfortunate but maybe when they see that we've resumed using bamboo, when they'll see how useful this resource is, when they realise how accessible it is since we don't have to buy them, and we could start using them even from today, then they'll wake up. I'm confident as a crop farmer and also a livestock farmer, there are many uses of bamboo to help me in my farm work, milking shed, fencing and housing as its cheaper, accessible and easy to use." - Navitalai Rokotuitai, 64 years, crop, livestock farmer

"Bamboo is readily available, right around the peripheries of the village boundary. More of this sort of trainings need to carry out amongst resource owners, those who are living in the villages amongst this important resource. If taught of its current usage trends and if properly taught of the new technologies, treatment methods will be more durable compared to some of the locally available timbers." - Varinava Murimuriwaca, 65 years – Retired Carpenter

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