Climate-U
Transforming Universities
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Climate change in higher education in Fiji: a literature review

Transforming Universities
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No. 9

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Abstract

This review explores the literature available regarding climate change and higher education in Fiji, especially in recognising the importance of learning about climate change for higher education students. The Fiji Climate Change Policy prioritises climate change in higher education but it is not clear what the role of higher education is in responding to climate change, or how to prioritise the capacity building of local communities to be able to prevent and reduce risks associated with climate change. However, the three main higher education providers – University of Fiji, Fiji National University and the University of the South Pacific – focus on climate change in their learning, teaching and research programmes and more can still be done to improve community response to climate change. As part of the Transforming Universities for a Changing Climate (Climate-U) research project, this literature review aims to identify what has been done to date and the gaps in the provision of the three higher education providers under study, including their climate change courses and programmes, and to create interventions to improve what is currently offered. It is argued that relevant and well targeted interventions will improve the communities' capacity to reduce the risks posed by climate change and build a more resilient and safe nation for future generations.

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Table of contents

1. Introduction

This working paper reviews the literature on Fiji and the wider Pacific regarding climate change and education. First, it explores the literature on the impact of climate change in the Pacific and Fiji. Second, it investigates the nature and extent of past and current work on climate change in higher education. Educational policies, curriculum details, research, and related publications on climate change and education are consulted to inform this review. Finally, the paper explores the challenges and potentialities that efforts to improve climate education face.

There is a dearth of studies in this area in the region, and a review of this type is crucial for identifying research gaps. The review is important for researchers, educators, policy makers, communities and the entire population in the Pacific island countries as climate change cannot be avoided. It is important for us to understand climate change contexts and frameworks if we are to tackle the challenges that we currently face in our different environments. The outcome of the review will help to inform our people about what we need to know about climate change, what we can do to sustain lives and our environment, and what higher educational institutions can do to equip students with knowledge and skills to address climate change and navigate the complexities of human societies and their natural environment.

Reports around the globe have indicated that climate change is now an existential threat deserving priority attention. The Special Report in 2018 of the Intergovernmental Panel on Climate Change (IPPC) indicates that human activities have caused an estimated 1.0° C of increased global temperature. The increase is projected to even reach 1.5°C between 2030 and 2052 if anthropogenic activities continue (IPCC 2018). The IPCC Report in February 2022 reported the need to take action now for a secure future and for the wellbeing of our people. It was also indicated in the Fifth Assessment Report (AR5) that there is unequivocal evidence in the increases in global temperature for both the atmosphere and the oceans (IPCC 2014). This, according to Simonovic (2012), is likely to have an impact on the number of abnormally cold days and nights, that is, there will be decrease in the number of cold nights, with an increase in the number of warm days and nights both on a global and regional basis. Such temperature and sea level changes, and their adverse effects, are particularly known to impact small island developing states (SIDS), such as Fiji.

SIDS have thus received global interest recently and are at the forefront of work on climate change impact; especially with the sea level rise, increasing temperatures and changing weather patterns and their adverse effects. With limited resources and isolated environments, SIDS have developed a wide range of practices to deal with climate change and extreme weather conditions, and incorporated them into their own cultural practices (Nunn & Kumar, 2018). At the same time, the particular challenges which they face are also the concern of international networks. For example, the Commonwealth is mandated to engage with the challenges of education in small island states such as the Caribbean region: efforts are currently being made in the Caribbean to establish a Regional Strategy for the Caribbean Research and Education Network (C@ribNET). Such collaborative strategies will enable more effective and relevant research on the distinctive environmental, financial and educational concerns and priorities of small states (Crossley et al., 2009). The recognition that SIDS both within and outside the Caribbean are at the frontline of environmental uncertainties and climate change offers important opportunities for the wider international community to learn from these small states, and their educational challenges, achievements and priorities (Crossley & Louisy, 2019). Basic education has long been achieved in many small states and as Crossley and Louisy (2019) highlight, small island states have been:

> "...among the first to extend the concepts and boundaries of basic education to prioritize secondary and higher education...and to reprioritize adult and lifelong learning. They have done much to pioneer efforts to move beyond what have long been the dominant global goals and targets...to prioritize skills training...to deal with teacher migration and other professionals..." (p. 426)

This literature highlights the long history of educational success in SIDS, including in Fiji. Right now, however, climate change is perhaps the most serious challenge confronting the microstates of the South Pacific, especially Kiribati, Marshall Islands and Tuvalu, and including Fiji. These island states are often referred to as the 'sharp end' or 'frontline' of global climate change (ESSRG 2021; Crossley & Sprague 2014; Robbie & Chand, 2017). To understand the ways in which climate change and education relate in these contexts, it is necessary to engage both with the 'global' definitions of the crisis, as represented in particular by the IPCC, and the understandings of indigenous Fijians and members of SIDS. The following section therefore brings together these two different but complementary definitions.

2. Defining Climate Change

Climate change or global warming, as interchangeably used by many, has many definitions. The IPCC defines climate change as the change caused by humans and nature (2012). UNFCCC (2022) defines it as the change in climate attributed directly or indirectly to human activity, in addition to natural climate variability, which is observed over a period. The latest report from IPCC (2022) warns of the consequences of not taking action now as climate change is a grave and mounting threat to our wellbeing and a healthy planet (Speech by Hoesung Lee, Chair of IPCC 2022). The IPCC Press Release in February this year (2022) noted climate change as a threat to the wellbeing and health of humans on the planet and there was a need to take action now to secure these and to deal with the increasing risks at hand. The IPCC documents the processes that culminate in climate change, while the definition adopted by the United Nations Framework Convention on Climate Change (UNFCCC) focuses on anthropogenic activities that change the structure of the global atmosphere (UNFCCC, 2022).

According to IPCC (2021, 2022), the evidence of climate change

is thus undeniable and many scientific researchers argue that the global climate is already changing. Nerem et al. (2018) indicate that over the past century, the global sea level has risen by about 20.3cm and it is accelerating each year. Scientists are concerned that the impacts of global warming are accelerating faster than expected, thus the concerned community, including mass media, has paid close attention. The UNFCCC signatories including the Kyoto protocols and the Paris agreement also have particular interest in ways to mitigate this and in adaptation strategies on how to tackle this problem. As Kumar et al. (2020; IPCC 2014) indicate, the world is dealing with climate change in two ways: one is mitigation, ways to reduce greenhouse emissions and the acceleration of climate change; and the other is adaptation, including ways to educate ourselves on how to live with the impacts of climate change and adapt ourselves for unforeseen future impacts.

On the other hand, Lagi (2015), explains that indigenous Fijians define climate change as the change in weather conditions that lead to changes in their environment. The indigenous Fijians rely on their environment for their daily weather forecast as this dictates their daily activities. Therefore, their concept of climate change is influenced by their lived experiences. For instance, some perceive climate change as the sudden increase in temperature that brings about rain and cyclones, whilst some see climate change as the increase in the frequency and amount of rain that contributes to the increase in insects that destroy the pandanus leaves that they use to weave their mats (Lagi, 2015). Schools in Fiji teach about global warming in their curriculum and school children understand climate change as the warming of the globe but often do not realize the serious impacts on their environment and daily activities (Lagi, 2015). It is, therefore, important that Fijians have improved understanding about the nature and impact of climate change. The differing definitions and perceptions also warrant greater awareness through formal and public education, so that everyone has a clearer understanding of the causes and challenges of climate change along with relevant mitigation and adaptation strategies.

3. Climate related challenges in the Pacific

In the Pacific, the islands are small, and resources are scarce. Due to the nature of small size, low elevation and remoteness, the degree of vulnerability to natural hazards is quite high (Kumar 2020). Many of these small islands are in the direct path of tropical cyclones. Storm surges and other natural hazards have become part of life and such challenges have made Pacific people accustomed to it (Kumar 2020). With climate change being a priority challenge for the Pacific, the small islands are feeling the full brunt of the impact. Climate change has threatened many Pacific people's lives and livelihoods, yet some voices still deny the fact that people are responsible for the cause of climate change. The impacts of climate change are experienced first-hand across the Pacific islands. For example, graveyards are now being fully inundated with many being unearthed, with bones, and skulls being washed up to the village settlements. This was the case on Nui Island in Tuvalu during Tropical Cyclone Pam in 2015. In addition, more waves now crash into houses and homes during high tides, farms are being affected through saltwater intrusion, and people are told to relocate to the new land (OCHA, 2015). The impacts of climate change are devastating in the Pacific, although their own emissions are only 0.03% of the world's total greenhouse gas (GHG) emissions. This compares to total GHG emissions in richer countries such as China (26.83%), the US (14.36%) and EU nations (9.66%) (Kumar et al 2020; IPCC 2014).

A large number of studies have assessed climate change, risks, impacts and vulnerabilities in specific countries or sectors and have made adaptation plans to deal with climate change (Schneider, 2007; IPCC, 2022). However, little is known about implementation and much less about the long-term effects and effectiveness of implemented measures. One of the challenges of adaptation in the small islands of the Pacific region is the lack of political will to implement long term adaptation measures, most probably due to human and financial constraints. For thousands of years, Pacific islanders developed knowledge systems that enabled them to settle and engage in continuous habitation of islands across a range of climatic and biogeographic variables (Thaman et al., 2002; Nunn, 2009; Campbell, 2010). They developed adaptive responses to living in marginal habitats for food production, e.g., food preservation, consumption of semi-wild foods, with severe disturbances from cyclones, tsunamis, volcanoes (Thaman, et al., 2002; Campbell, 2010). Pacific islanders' traditional knowledge is well documented and widely practiced. Indeed, they have traditional calendars that guide resource use and management within the community, for example the month of February in the Fijian calendar is known as the 'vula-i-sevu' the harvesting month where men harvest *yam* and *Nuqa* (Siganusvermiculats) and *sevu* offer the first harvest to the chief. This traditional ecological knowledge determines when the first fruits of the land or harvest is first given to the Chiefs, then followed on by a hierarchical order of status of people in the village with the last served being the harvester or owner of the harvest. Moreover, due to the advent of Christianity, the priests, reverends or church leaders are given the first offering even before the chiefs. This is referred to as the indigenous local knowledge (ILK) (Ryser 2012).

In this modern era, adaptation is often dependent on the availability of external aid funding which comes with its own challenges that include short time aid-funded projects, yearly fluctuations of flow and considerable administrative burdens for planning and reporting (Campbell & Barnett, 2010; Overton, Prinsen, Murray, & Wrighton, 2012; Dornan & Pryke, 2017). Hence there is a need for more research on this. Adaptation policy should continue to meet people's expectations and aspirations for a good life. It needs to anticipate changes and to engage in outreach in the community. Adaptation activities need to be integrated with existing national and regional structures and programs. Awareness and an understanding of climate change in local and indigenous contexts is important for adaptation. One apparent concern in the small islands is that the focus has been on single case studies and comparative work across the different islands in the region is rare (Klock & Nunn, 2019). Inter-island and inter-regional exchange has been to some extent marginal but there needs to be a concerted effort at bringing together individual cases (Moncada, Briguglio, Bambrick, & Kelman, 2018; Walshe & Stancioff, 2018) so that they are not treated in isolation.

In the context of climate change, small islands are almost automatically linked to migration. Migration has always been part of island life. Islanders migrate, temporarily or permanently, within and across national boundaries, for various reasons that can include employment, health, education, or social relations. Given that the decision to migrate is always a multi-dimensional one, it is difficult – if not impossible – to separate climate change from other drivers of migration. It also remains rather unclear to what extent climate-related or environmentally induced migration follows different migration patterns (Campbell, 2014). One difference is the potentiality of no return: while migrants usually uphold strong relations to their home village, island, or state, this may no longer be possible when entire villages or islands become uninhabitable.

Clearly, climate change presents extreme challenges to islands and islanders, and many barriers – such as limited resources, small and siloed administrations, and remoteness – make it difficult to implement context-specific, suitable, and sustained adaptation strategies. But despite these challenges and despite their diversity, islands and island societies share a great resilience in the face of change.

The comparative smallness and remoteness of the Pacific islands explain why many island societies are relatively impoverished, as measured by economic yardsticks, and therefore considered more in need than others of external assistance for adapting to future climate change (Betzold, 2015; Robinson, 2017; Nunn & Kumar, 2018). There is ample evidence that recent climate change is causing or amplifying livelihood challenges for many Pacific island inhabitants. This ranges from issues of water security (Belmar, McNamara, & Morrison, 2015), unprecedentedly strong tropical cyclones (Cinco et al., 2016; Walsh et al., 2016), shoreline erosion and lowland flooding (Nunn, 2013; Betzold & Mohamed, 2017), to coastal-settlement relocation (Gharbaoui & Blocher, 2016; Charan, Kaur, & Singh, 2017). There is a great mismatch between the magnitude of projected impacts and the insufficiency of preparedness of island societies (Nunn, 2010; Khan & Amelie, 2015) as well as the likelihood that entire islands, even whole island groups/countries, may be rendered uninhabitable within a few decades (Dickinson, 2009; Odalen, 2014; Schulte, Dridge, & Hudgins, 2015). Most solutions adopted for climate-change adaptation in island contexts have been short-term, reflecting both the culturally grounded preferences of many islanders and their dependence on time-limited (aid) funding assistance (Nunn, 2009). The emphasis on short-term interventions will inevitably lead to an amplification of the magnitude of livelihood challenges for many island communities by the mid-21st century when both the pace of sea-level rise (and other manifestations of climate change) will likely have increased and the amount of external funding available for adaptation will likely have dropped significantly as donor nations divert funds towards the increasing costs of their own adaptation (Brown, Daigneault, & Gawith, 2017; Travis, Smith, & Yohe, 2018; Nunn & Kumar 2019).

Recently, the Pacific Elders' Voice (PEV) (2022) responded to the visit by the US Secretary of State Antony Blinken with the following points to make about regional security in the Pacific:

> "The primary security threat to the Pacific is climate change… We affirm that climate change remains the single greatest threat to the livelihoods, security and well- being of the peoples of the Pacific…China, US and its allies, including Australia does little to address the threat caused by climate change…Adequate funding for loss and damage caused by climate change need to be addressed… Little has been done for reparations for the damages caused by these countries…Sea level rise caused by climate change is likely to exacerbate nuclear contamination of the Pacific." (p. 1).

The PEV report stressed the importance of cultural resources and traditional knowledge in climate change adaptation on small islands in the Pacific and its significant contribution to adaptive capacity and resilience. Climate change provides a new framework for thinking about development. It is a sign that we have pushed the system to its limit, and the present generations' consumption of natural resources has reached a level that threatens our very existence. It is a challenging reminder of what we need to ensure long term well-being and prosperity. Climate change signals the need for action by every individual living on this planet. Everyone is responsible and we all need to take responsibility. The elders of the Pacific request that all nations including the US respect the sovereignty of the Pacific peoples and their right to develop and implement their own security strategies without having to be coerced by outside nations (PEV, 2022).

Climate-related education is a challenge in many small countries of the Pacific. Crossley and Louisy (2019) state that climate change and environmental uncertainties have been the dominant concerns in SIDS and this has implications for education and training in these contexts. The adoption by the UN General Assembly of the 2030 Agenda for Sustainable Development and the implementation of the SDG goals is more global in coverage and reflects the many concerns of many small island states. However, "… it remains to be seen if this is more globally inclusive spirit and cross-sectoral scope will be implemented in context-sensitive ways that are compatible with the aspirations, priorities and values held within the Commonwealth small states…" (Crossley & Louisy, 2019, p. 462). Crossley (2019) also cautions against the uncritical international transfer and borrowing of educational and environmental policies, arguing that far too often insufficient efforts are made to adapt them to specific local conditions. The following section of this working paper considers climate policies in Fiji, linked to questions of this 'context-sensitivity' that Crossley and Louisy (2019) raise.

4. Climate change policy in Fiji

The Pacific Islands are trying hard to reduce vulnerability and that is through improving adaptive capacity (Kumar et al. 2020). Adaptive capacity is based on the assumption that people can access, understand and use new knowledge to inform decision making. This is true in some instances, but most of this knowledge

is generated outside the Pacific context and tends to be perceived by Pacific people as new (Nunn 2009). This is why most of the external interventions for climate change adaptation do not work in the Pacific (Kumar et al. 2020; Piggott-McKellar et al. 2019). This does not imply that the Pacific people's adaptive capacity is low, it is rather that adaptation strategies are not relevant and practical. For instance, one of the common adaptation strategies used in Fiji is the building of seawalls. In Qoma Island, this proved to be unsuccessful as flooding continued. One of the reasons for the ineffectiveness according to the World Bank (2000) is the lack of proper evaluation of the adaptation options. There are other effective options like replanting of mangroves and the traditional conservation strategy that could be used, but instead, a non-Pacific strategy was used and proved to be ineffective.

Moncada and Bambrick (2019) carried out a study of Rabi Island, in Fiji, by exploring the responses of the people to climate variability in this coastal communities to understand to what extent current coping is conducive to long-term adaptation to climate change, and how development status affected their responses.

> Rabi Island shares many of the climatic challenges of islands across the Pacific but its inhabitants are an ethnic minority in Fiji, being resettled from Banaba Island (Kiribati) as a result of phosphate mining. Despite this additional barrier, Rabi Islanders draw on a variety of livelihood resources to respond to different climatic and non-climatic shocks, such as cyclones, droughts, and lack of easy market access. While many of these response measures – for example reducing consumption and shifting to other foods in case of drought – are sustainable, they may better be qualified as short-term coping rather than long-term adaptation. Long-term measures – for example upgrading infrastructure and housing, or installing a water management system – are known, but lack of resources prevent their implementation, while limited market access means that the communities are unlikely to increase income.
> (Moncada and Bambrick 2019, p. 9).

The authors therefore conclude that development deficits need to be addressed to help remote coastal communities deal with climate change.

In the past few years, Fiji has continuously raised awareness to regional and global audiences on climate emergencies in Fiji and the Pacific region. Fiji's active role in the recognition of urgent coordinated actions needed to combat issues related to climate change has resulted in the implementation of national climate change policies, initiatives and acts. This in itself indicates the lack of responsiveness to discussions of climate policy in the country in the past few years. Recently, on 23rd September 2021, Fiji's parliament enacted the Climate Change Act 2021 (CCA) and published it in the Government of Fiji Gazette (2021) on the 24th of September. The primary purpose of CCA 2021 is to implement at the national level Fiji's commitments and obligations to reduce its GHG emissions along with other climate change objectives (CCA, 2021). Sloan (2021) highlighted some of the fundamental objectives of the CCA 2021, which include: to reduce the production of greenhouse gases and accurately measure that reduction in accordance with international law standards; to boost Fiji's efforts at carbon sequestration meaning the removal and storage of carbon in its natural environment; to respond and adapt to the destructive effects of climate change; to improve the health and security of Fiji's oceans for a number of reasons

Figure 1 : Map of Fiji islands

including the role of the ocean in mitigating the effects of climate change; secure and coordinate sustainable climate financing for Fiji. The CCA 2021 serves as a positive indication of Fiji's regional role in the fight to control GHG emissions, and the seriousness of Fiji's stance on the matter at hand, i.e. climate emergencies.

Prior to the enactment of the CCA 2021, the Fiji government developed an overarching climate change policy instrument in 2012, termed the National Climate Change Policy (NCCP). It was not until 2018 that the NCCP 2012 was revised due to the evolving nature of climate change issues and priorities (Ministry of Economy, 2021). The revised NCCP 2018 used a 'weaving' approach, prioritising relevant issues related to climate change and providing objectives and strategies for protecting Fiji's people, environment, and economy (ibid). This weaving approach is an indigenous Fijian practice of 'curui' – weaving or patching together – which has been used as a metaphor to explore connections between climate change, gender equality and education in Fijian policies and practices (Lagi et al. forthcoming). Fiji's Ministry of Economy (2021) highlighted that this national policy is also closely aligned to Fiji's 5-year and 20-year national development plan (NDP) and "seeks to accelerate Fiji's progress towards achieving the Sustainable Development Goals (SDGs), and other national, regional and global commitments" (p. 3). The NCCP 2018 outlines eight core principles of the policy. These are sustainable well-being, social cohesion, inclusivity, partnership, agility, urgency, transparency and communication, and integrated learning. The NCCP 2018 also highlighted critical roles of the private sector to ensure that climate change adaptation, GHG mitigation, risk reduction, and environmental protection objectives and actions can be interlinked and collectively addressed (Ministry of Economy, 2021). This policy has been carefully designed so that it is aligned to international conventions and re-affirms Fiji's commitment under the Paris agreement which Fiji was first to ratify in April 2016. Therefore, from a policy standpoint, Fiji's commitments have been immense in making sure that relevant policies and acts are developed to address climate change issues at the national level. With the NCCP 2018 and CCA 2021, new government bodies will be created and pave the way for future policies on climate-related issues. The only 'action' that Fiji needs to do now is to operationalise these policies and the CCA 2021 so that climate change issues are collectively addressed right from village-level communities and bodies to the national level.

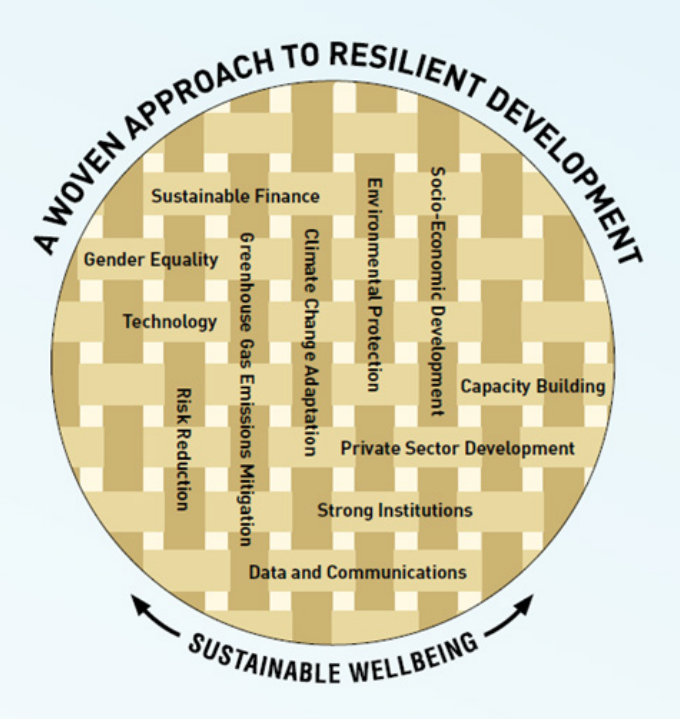

Figure 2: Weaving Approach (NCCP,2018,p.7)

In addition to the CCA 2021 and NCCP 2018, Fiji also has a Nationally Determined Contribution (NDC) Implementation Roadmap 2017-2031. Fiji, as being a member nation of the Paris Agreement, was required to prepare and maintain a Nationally Determined Contribution (NDC) towards global reductions in GHG emissions (Singh, 2020). Thus, with Fiji's active role and commitments in global and regional climate-related issues, the NDC implementation roadmap 2017-2031 was developed and launched in Bonn, Germany in 2017. This Roadmap sets out Fiji's ambitious targets in reducing "CO2 emissions by 30% from a BAU (Business As Usual) baseline scenario in 2030, by striving to reach 100% renewable energy power generation and through economy-wide energy efficiency" (Ministry of Economy, 2017, p. 4). The NDC Implementation Roadmap primarily focuses on mitigation actions on three energy sub-sectors. These are Electricity Generation and Transmission, Demand-Side Energy Efficiency, and Transport (Ministry of Economy, 2017). The roadmap highlights short-, medium- and long-term renewable initiatives required in these subsectors to achieve the 30% emission reduction target (ibid). Fiji's Ministry of Economy (2017) further reported that the roadmap also outlines key foundation elements that will ensure the successful implementation of the NDC implementation roadmap. These foundation elements are governance and institutional arrangements, Monitoring, Reporting and Verification (MRV), and financing. The NDC implementation roadmap has many ambitious aims and targets, and it is quite apparent that the financial aspect of implementing the roadmap is the major factor. New financial strategies and mechanisms need to be developed in order to address the mitigation target of the roadmap (Singh, 2020).

The launch of Fiji's NDC Implementation Roadmap 2017-2031 was a bold move by the Fiji government considering the economic capabilities of the country to implement actions outlined in the roadmap. However, ever since the NDC implementation roadmap was launched, there have been projects implemented on the ground in Fiji to contribute to this roadmap and to Fiji's emissions reduction target under the Paris agreement. Some of the projects have been jointly conducted by regional organisations and tertiary institutions in Fiji so that aspirations in the Paris Agreement and national strategies and plans are translated into workable solutions. A case in point, the Pacific Island Development Forum (PIDF) and the University of Fiji published a book in 2020 on the projects that have been undertaken to contribute to Fiji's NDC

Implementation Roadmap 2017-2031. Some of these projects have verifiable data that can be monitored easily for emissions reductions (Singh, 2020). These renewable energy (RE) projects include hydropower, solid biomass and waste-to-waste (wte) for power generation, onshore wind farms, solar energy for power generation, coconut oil as a source of transportation fuel, second-generation feedstocks for biodiesel production, and bio-butanol as a fuel additive for petrol engine fuels. These RE projects, as argued by Singh (2020), could contribute meaningfully to emissions reductions.

At a more national level, Fiji has implemented various frameworks in the past in addressing climate-related issues. Notably, these were the Green Growth Framework for Fiji in 2014 and the Disaster Recovery Framework in 2016. For the Green Growth Framework for Fiji 2014, one of the key thematic areas was building resilience to climate change and disasters. The framework acknowledged some of the challenges that Fiji is facing in relation to climate change are sea-level rise and intense flooding which threaten the water supply, coastal infrastructure and land areas; increased frequency and intensity of natural disasters which in turn may have negative impacts on food security (caused by a decline in freshwater availability, crop production and fisheries), coral reefs and forest biodiversity and the spread of certain diseases (especially through contaminated water) (Ministry of Strategic Planning, National Development & Statistic, 2014). The framework highlighted that climate change disasters have increasingly impacted Fijian communities and there is a need for partnerships at all levels for building resilience for climate change and disaster (ibid). A notable action proposed in the Green Growth Framework for Fiji 2014 was Relocation as a long-term climate change adaptation strategy. Ever since this framework was produced, the Fijian government has identified 40 villages in need of relocation to higher ground due to climate change disasters (Simpson, 2020). A well-documented Fijian community that has been relocated successfully due to climate change is Vunidogoloa village (McNamara & Combes, 2015). Therefore, planned community relocation remains to be crucial in the current discourses of climate change adaptation in Fiji as more communities are facing sea level rise and severe coastal erosion.

Following the Green Growth Framework for Fiji in 2014, Fiji faced a number of natural disasters which may be attributed to climate change. A notable one was Cyclone Winston in 2016. Tropical cyclone (TC) Winston was one of the strongest tropical cyclones ever recorded (Di Liberto, 2016) and prompted the Fiji government to produce the Disaster Recovery Framework (DRF) 2016. The DRF sets out principles for mid-term recovery from mid-2016 to mid-2018 (Ministry of Economy, 2016). The DRF was developed to "guide the planning and implementation of recovery programmes and projects, providing overall direction to individuals and organisations that have a role in recovery activities including government, the private sector, development partners, civil society and communities" (p.3). The DRF has recognised that post-disaster recovery is a long-term effort in which strong coordination is needed. The engagement and support of relevant stakeholders, especially with communities affected, is important in this recovery effort. However, it has also been acknowledged that Fiji's recovery plan in the DRF 2016 required significant financial backing which was estimated by the World Bank to amount to F$731 million (US$340 million) (Mansur et al, 2018).
Post Tropical Cyclone Winston, Fiji recognised the importance of a long-term recovery plan especially in building resilient Fijian communities. As a result, the Fiji National Development Plan (NDP) was launched in November 2017 that included goals, policies and strategies that were aligned to Fiji's proactive approach to climate change-related issues. Two of the notable policies in the NDP (2017) that address climate change-related issues a tabled below, alongside their respective strategies:

Figure 1Table 1. Notable policies in the NDP (2017) that address climate change-related issues

(Source Ministry of Economy, Fiji Government (2017)

NDP Policies	Strategies
Strengthen understanding of the impacts of climate change and disasters in order to better plan for recovery and long-term development.	• Develop a comprehensive assessment framework, including the adoption of the damage and loss assessment methodology. • Institutionalise a mechanism to collect and analyse hazard, vulnerability and exposure data. • Mainstream cost-benefit analysis into decision-making processes in mitigation and preparedness measures. • Encourage collaboration with development partners and tertiary institutions in researching priority areas of climate change and disaster risk reduction. • Develop hazard maps and models for all potential hazards (including sea level rise, storm surge, flood and tsunami).
Strengthen partnerships at all levels for building resilience to climate change and disaster.	• Partner with civil society to build capacity at divisional and community level on resilience to climate change and disasters. • Undertake vulnerability assessments for all communities. • Develop climate and disaster resilience plans for rural communities. • Ensure that every rural community and every rural school has at least one building resilient to a category 4 cyclone. • Provide capacity building to communities that have been identified as vulnerable to rising sea levels and in need of relocation.

It is without a doubt that at the national level, in terms of social policies and initiatives for climate change-related issues, Fiji has contributed immensely. Fiji continues to play an active role and collaboratively work with other Pacific Island countries in addressing the issues of climate change in the region. Regional organisations and Fiji's tertiary institutions such as USP and FNU have also contributed to the discourses of climate change in the Pacific through collaborative research projects. These projects have indicated significant impacts in addressing climate change-related issues in the Pacific region.

The fourth objective of the Republic of Fiji's National Climate Change Policy objectives and strategies is education and training that highlights the integration of climate change in school curricula, tertiary courses, and vocational, non-formal education and training programmes. It should involve the reviewing and updating of the current primary and secondary curricula, and the tertiary and vocational education courses to ensure inclusion of local, accurate and current climate change information, and to encourage student research around the issue of climate change. The assessment and review of teaching contents, material, tools and research on climate change is a necessity. Intervention programmes in primary and secondary and tertiary and non-formal education are to be developed to incorporate climate change. Understanding climate change, and taking action on mitigation and adaptation and developing appropriate training tools on climate change for government officers involved in awareness and training programmes in all government departments are stipulated in the National Climate Change Policy and should therefore be addressed adequately.

5. Education for Sustainable Development in the Pacific

Education for Sustainable Development (ESD) plays a central role in international discourse about learning for sustainable living. The UN Decade for ESD (2004-2015) played an important role in setting the directive and pace for global recognition of the significance and value of ESD to the region (Koya et al., 2010). ESD is of growing interest in the Pacific Region, recognised as an inclusive life-skills package bringing together formal and non-formal education (Koya, 2011). Koya (2011) further states that The Pacific Plan (2004); the Pacific ESD Framework (2006) and the Action Plan for Implementing ESD in the Pacific Islands (2008-2014) formed the basis for ESD planning and implementation in the region. The following paragraphs highlight some of the discussions on ESD in the region. We begin with Konai Thaman's statement about ESD:

> Education for sustainable development, from a Pacific perspective, is education for cultural survival and continuity. As such, it will mean a total transformation of the way we behave and educate, which, up until now, has been moving Pacific people and their communities in a direction that is leading to un-sustainability (Thaman, 2010).

Konai Thaman (2019, p. 1) also made the following comment on sustainable development (SD):

> It is also assumed that most people in the world today know about the 17 Sustainable Development Goals (SDGs) and that most educators know about Education for Sustainable Development (ESD). Many people who talk about, teaching and doing things related to ESD know that ESD is not as straightforward or as easy as they would like or had expected.

In discussing ESD as taught in schools, Konai Thaman adds:

> It is important not to see ESD as another school subject but mainstreamed into all subjects. Conceptual frameworks for incorporating ESD into the school curriculum need to be developed and adopted by curriculum planners and teacher educators. Different perceptions of ESD need to be taken on board by curriculum personnel as well as teachers who need to appreciate that ESD involves both content and pedagogies . . . finally current international (and regional) programs also need to be reoriented to address ESD. (Thaman, 2010, p. 8–9).

There is a need to provide a background for understanding the needs of the diverse perspectives that peoples of the Pacific view ESD and to which ESD goal they need to focus on. Thaman (2019, p.3) referred to Pacific islanders as:

> ...those whose ancestral homes happen to be in the region that UNESCO calls Oceania or Moana, the name that many indigenous Pacific people use to call their "place" and which Hau'ofa (1993) referred to as a sea of islands, and people's interconnectedness in a physical as well as a metaphorical sense. It is culture that is lived, not debated. It provides the contexts for what we do and who we are; what we know and believe in; how we choose to live our lives, and what preoccupies our thinking.

Education and development in the Pacific context have been dominated by foreign cultures for over a century and these include their language, knowledge systems, communication networks and research paradigms (Thaman, 2019). The development community viewed the Pacific region and its people as under-developed, so islanders had to improve and educate themselves in the ways of the West. The process of "improving", resulting in the varying dimensions of cultural transformations and re-orienting ourselves and our cultures to fit a predominantly Western, scientific, and industrial worldview, was often done by the banning of different aspects of Indigenous religious practices that did not reflect Christian beliefs and values, as well as the introduction of schools and the requirement of teaching and learning in foreign languages. According to Thaman (2019) formal education in the Pacific today, from early childhood education to university, is largely undemocratic as it

does not consider the cultures of learners and teachers and as Linda Tuhiwai Smith (2005, p. 28) said:

> ...imperialism and colonialism brought complete disorder to colonised peoples, disconnecting them from their histories, landscapes, languages, social relations, and their own way of thinking, feeling, and interacting with the world.

The Asia Pacific Framework for ESD researched people's ideas of SD before initiating ESD projects (Thaman, 2019). Some of the research into Pacific traditional knowledge and its role in understanding ESD and change have found that, although ESD may be a new concept for many Pacific people, sustainable living and sustainable livelihoods are not. In Fiji, for example, Nabobo-Baba (2006), Mataitoga (2010) and Naisilisili (2011) explain that SD is closely linked to the indigenous Fijian notion of *Vanua*, an all- embracing concept that fully describes and embraces people, their culture, cosmologies, epistemologies, and, most importantly, their languages. Tonga has a similar notion called *fonua*, along with *whenua* in Maori. Within such framings, inter-personal as well as inter-group relationships (*vaa/wah*) are seen as central to the survival and continuity of a culture and impact people's behaviour and practices (Thaman , 2019). In Kiribati, on the other hand, SD is life itself and involves understanding the past in order to sustain the present and conserve resources for the future. For other Pacific indigenous people, SD is always about relationships. Maeltoka (2010) reports that, for his people in Vanuatu, SD includes processes and protocols that ensure the protection and maintenance of important relationships. In essence, for many Pacific islands, SD is about nurturing relationships among different aspects of a culture—people and other living and non-living things—for the purposes of cultural survival and continuity.

In many Pacific contexts learning and living are two sides of the same thing: one assumes the other. The embeddedness of learning in sustainable living is best illustrated by the Tongan conception of sustainable livelihood. The Tongan notion of SD is *mo'ui fakapotopoto* (living in the way of a *poto* [wise] person) (Johansson-Fua, 2006). Moui is a way of living — in fact, *mo'ui* is life itself; *poto* is the basic concept of Tongan education—the end result of learning or, as Kavaliku describes it, the positive application of *'ilo* or knowledge (Kavaliku, 1977). *Poto* privileges learning, understanding, and behaving in a culturally appropriate manner. In other words, knowing what to do and doing it well (Thaman, 2019). Such learning is not confined to formal education but occurs in different epistemological sites within indigenous communities and reflects all aspects of a community's way of life, including their heritage arts (Koya, 2013). It is obvious, therefore, that the current discourse on ESD does not adequately capture many of these processes; that more research is urgently needed in order to obtain a better and fuller understanding of what SD means to Pacific island peoples and how educators may improve their approach for facilitating learning for sustainable development (Koya, 2011).

USP has played a significant role in ESD and leads the promotion of ESD in the region. The USP Pacific Centre for Environment and Sustainable Development (PACE-SD) offers postgraduate programmes in climate change and is the centre for the University's ESD efforts. USP had undertaken previous projects like the Asia-Pacific Cultural Centre for UNESCO (ACCU-USP) Project 2007-2011 that focused on teacher education, sustainable education and community empowerment (Koya, 2011). In 2010 the School of Education at USP produced a three-volume ESD series to help contextualise ESD within a culturally situated understanding of ESD and this material has been widely used (Crossley and Sprague, 2014). The book series looks at how indigenous knowledge can and should influence development in the Pacific islands and the role of the University in promoting and supporting this. Significantly, they offer insight into the role that education (formal, non-formal and informal) should play in preparing people for life long learning and for survival in the many challenges of the present.

USP's PACE-SD was opened in response to the region's need for further research on the environment. It has worked with regional governments in an advisory capacity, mainstreaming climate change and sustainable development into the development process. It has made a strong commitment to international efforts to prevent further irreversible environmental change and to promote sustainable development by becoming party to many international "Multilateral Environmental Agreements" PACE-SD is a partner in making those commitments a reality. The Centre collaborates with university stakeholders as well as national, regional and international development partners across the civil society organisation (CSO) and non-governmental organisation (NGO) sectors. PACE-SD has also recently facilitated youths-as-emerging-environment leaders in ESD and conducted other climate change related workshops.

Koya (2011) noted a marked shift in thinking by Pacific leaders about sustainability and the benefits of sustainable development and sustainable consumption in local markets. The ESD approach that they refer to is one that takes this context and places it within the broader discussion of socio-cultural development whose aim is to nurture local communities while working towards a replenishment and conservation of the local environment (p. 2). ESD projects have been undertaken at USP that include the Asia/Pacific Cultural Centre for UNESCO (ACCU-USP) project 2007-2011 "Mainstreaming ESD for Capacity Building in Pacific Island Countries (PICs)" and the Network of Island Universities. A few courses have been developed in a variety of areas one of which is climate change and teacher education at undergraduate and postgraduate programs.

The postgraduate programme at USP for instance, offers postgraduate courses in ESD which have been included at the 400 level: ED461 (Education for Sustainable Development) and ED451 (Culture and Education). These courses focus on the UN Decade of Education for Sustainable Development (DESD) and its relationships to other global initiatives namely the Millenium Development Goals (MDGs), United Nations Literacy Decade, and Education for All (EFA). Students are encouraged to conduct research on how Pacific communities conceptualise the main ideas, issues and solutions associated with ESD. Students then

critically analyse the implications of their findings to the successful implementation of the Pacific ESD Framework in 2006 in their home countries (Koya, 2011). Topics studied in the course include: Research in and for ESD; the Role of USP in ESD promotion and advocacy; Climate Change Education and ESD and UNESCO's Global Monitoring and Evaluation Group (MEEG).

There have been forums in ESD through conferences that have been proven useful in engaging Pacific scholars and practitioners for sustainable praxis period. For example in 2010 the conference on Oceans, Islands and Skies – Climate Change and Creativity was held in Suva from the 13th to the 17th of September 2010 and it featured scholarly presentations and art exhibitions including literary arts, visual, dance, and music genres. Themes included indigenous knowledge, environment and creative expression within the broader climate change discussions (Koya 2011). Youth camps were organized by AUSAID on "Climate change Rural Adaptations in Fiji" allowing young people hands-on contextualised real-life learning. The goal of the learning is to create awareness of human rights laws and mechanisms and inter-linkages with climate negotiations and the issue of climate justice. There is also an urgency for adaptation to climate change in the Pacific island countries, hence a Pacific Adaptation to Climate Change (PACC) was developed to assist with the implementation of adaptation measures in 11 countries of the region, with the Fiji Islands included as one of the participant countries. The main objective of the PACC is to facilitate the implementation of long-term adaptation measures to increase the resilience of key development sectors in Pacific Island Countries (PICs) to adverse impacts of climate change. The idea is to use innovative educational ideas to help young people understand, mitigate and adapt to impacts of climate change, encourage changes in their attitudes and behaviours that are needed to put their world on a more sustainable development path. This will build a new generation of climate change citizens that are aware of adaptation to climate change in the Pacific islands. A framework for PACC was developed through a consultative process involving stakeholders from governments, NGOs, donor partners and the private sector (SPREP, 2010).

6. Climate Change, Education and TVET in Fiji

Climate change educational programmes have been implemented by various regional and national stakeholders in these last few years generating knowledge and best practices on local climate change impacts and options for adaptation and mitigation and for raising awareness in general. There is a need now to make this knowledge available to the people in the country and especially to children as they are growing up and experiencing the increasing effects of climate change in the future. Education will be the forum that will assist in strengthening and stimulating people's ability to cope with the challenges of climate change. As highlighted by the South Pacific Community (2018):

> To ensure relevance and effective learning, the delivery of knowledge on climate change should be oriented towards local contexts and experiences and should prioritise traditional knowledge.

The South Pacific Commission (SPC) is an international organisation established in 1947 whose activities cover 20 countries and territories of the Pacific. Particular emphasis of the organisation is given to assessment and development of marine resources, rural development, youth and community development, public health, cultural exchanges, expert consultancies and training. SPC carries out practical investigation projects, promotes and conducts technical meetings and training courses, assists applied research of significance to the region, stimulates contacts and exchanges between people of the region (Grandperrin & Crossland, 1980).

Hence the experts on climate change in the Ministry of Education in the region should take the lead in incorporating global and local climate knowledge into national formal and non-formal educational systems including TVET. The Coping with Climate Change in the Pacific Island Region's (CCPIR) education and climate change component supports the Pacific Islands Framework for Action on Climate Change (PIFACC) Principle 4 on education, training and awareness. It also promotes adaptation knowledge to significant people in the region who support PIFACC and PEDF and has supported the implementation of PIFACC and PEDF and the Pacific Education for Sustainable Development Framework (PESDF) since 2006.

Climate change education is already experienced by children and young people in the primary and secondary schools and Technical Vocational Education and Training (TVET) sectors in Fiji, Kiribati, Samoa, Tonga and Vanuatu through integration into the primary school syllabus, secondary school basic science, geography, agricultural science and TVET education (South Pacific Community, 2018). This integration–based course of study is important for the region as this is in line with the regional Secretariat of the Pacific Community and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) or the SPC/GIZ programme CCCPIR, which aims at integrating climate change into primary and secondary education and TVET through its European Union Pacific Technical Vocational Education and Training in Sustainable Energy and Climate Change Adaptation (EU PacTVET) project (Hemstock S.L. et al., 2017; SPC 2016). As a result, this integration of climate change into the Pacific schools' curricula is unquestionable and essential, in playing an active role in bolstering the next generation to come, to be more resilient by 2030 and beyond (Havea et al., 2020).

Due to the vulnerability and the geographical make-up of the Pacific region, it is important to mainstream climate change mitigation and climate change adaptation concepts into the national primary and secondary schools' curriculum. Relevant topics and concepts that are applicable to the countries can be identified under climate change and integrated into the various subjects existing in the national curriculum. It will include the production of relevant teaching and learning resources suitable for

each level of schooling and encourage capacity building activities for local teachers in revising and updating curriculum in schools.

Climate change plays an important role in educating young people and the future leaders of PICs. Implementing appropriate educational strategies and actions will provide them with the correct knowledge and equip them with the necessary skills and attitude to adapt to climate change and mitigate its causes. Climate change education plays an important role in development and in achieving a more sustainable future.

Another regional collaboration project that examined climate-related issues was the EU PacTVET. The key partners that implemented this project were the Secretariat of the Pacific Community and the University of the South Pacific. This collaborative approach by the two regional institutions has proven to be beneficial in addressing climate change-related issues in the Pacific (Buliruarua et al, 2015). Funded by the European Union (EU) and co-funded by the German Agency for International Cooperation (GIZ), this project builds on the recognition of the major issues hindering social, economic, and environmental development in the 15 Pacific – African, Caribbean Pacific (P-ACP) countries where there are energy security and climate change impacts. Therefore, there is a need to enhance sustainable energy (SE) and climate change adaptation (CCA) in these territories. To enhance the P-ACP's response to SE and CCA, the EU PacTVET project has recognised that some of the barriers for ES and CCA are due to the lack of local capacities and expertise (Buliruarua et al, 2016). The absence of well-trained staff, sustainable training programmes, absence of well-equipped and well-resourced training institutions to support these programmes have also been identified as barriers to P-ACP's ES and CCA. As the result, the EU PacTVET project has developed regional qualifications in Resilience and SE on levels 1-4 on the Pacific Qualification Framework (Hemstock et al, 2017). The project has established a new TVET subject area called Resilience in which the focus will be on CCA and disaster risk reduction (DRR). This is regionally accredited as well under the Educational Quality Assessment Programme (EQAP). The project has also funded and participated in regional initiatives that will provide regional and local capacities and expertise on SE and CCA (ibid). Therefore, the EU PacTVET project has provided a fine blueprint on how regional organisations can collaborate to improve the Pacific's capacity development on issues related to climate change. It also outlines the importance of overseas aid in financially supporting the region's ES and CCA programs.

There have been other considerable regional initiatives carried out so that Pacific communities can be acquainted with climate change-related issues. One of these initiatives was developing a picture-based education resource called *Learning about Climate Change the Pacific Way* (SPC and GIZ, 2013). This education resource was produced for students, teachers and facilitators in the Pacific islands. It is an educational resource that illustrates and explain key concepts such as climate, the causes and effects of climate change, and adaptation and mitigation options for the Pacific Islands (ibid). This initiative was a collaborative one in which the Secretariat of the Pacific Community in partnership with the GIZ through the Coping with Climate Change in the Pacific Islands Region (CCCPIR) Programme and other collaborative agencies, including USP, aimed to make Pacific learners of any age understand climate change-related issues.

In terms of raising awareness, as indicated by Kumar et al. (2020), education is key. According to UNESCO (2009), education whether it is formal or informal, has an important role in emission reduction, mitigation and climate change adaptation. Many Pacific island students learn climate change through the school curriculum, but due to the remoteness and isolation of these small islands, telecommunications tend to be the problem. Small, isolated islands in the Pacific seldom have access to transport, telecommunications and media. As such, learning resources do not arrive on time, or do not arrive at all. Therefore, these students are disadvantaged and do not fully learn about climate change as the students in the cities and towns. This problem, however, seems to have improved as smart phone providers have flourished (Kumar et al. 2020). The knowledge and the awareness of climate change depends on the success of conventions and protocols.

7. Sustainability and Climate Action in Higher Education Institutions

Generally, higher education institutions (HEIs) have undertaken active measures to contribute to sustainable development (Amaral et al., 2015; McCowan 2016) and this has increased since 1987 (Lozano et al., 2013) and further promoted through the UN Decade of Education for Sustainable Development (DESD, 2005 – 2014) which aimed to integrate the principles of sustainable development (SD) into all aspects of HEIs (UNESCO, 2014).

Research on SD in HEIs mainly consists of case studies of institutional operations with little examination of broader SD policies or impacts of SD. Koehn and Uitto (2014) highlight that the issue is, "under-researched [and] has tended to neglect that impact involves real world changes in ecological sustainability, policies and people's wellbeing (p. 624)". Further discussions on climate change initiatives in higher education are discussed below. In order to achieve quality output in the education system in Fiji, the Ministry of Education initiated a number of policies and standards including the establishment of statutory bodies, one of which was the setting up of the Fiji Higher Education Commission (FHEC) in 2010. The FHEC was set up to regulate the higher educational institutions and to ensure that the delivery of higher education and training was of quality standard and meet national standards. In 2014, the FHEC established the Committee for the Accreditation of Academic Qualifications (CAUQ) whose members were the Vice Chancellors of the University of the South Pacific, Fiji National University, University of Fiji and an Independent Chairman to approve any new programme or revised programme in all Fiji's universities, including climate change programmes offered in the three universities (FHEC, 2015).

Although NGOs like the SPC have built capacity in the primary and TVET section, tertiary institutions are also taking on board the responsibility of including climate change in their teaching and research areas. The three main universities that make up the national higher education system in Fiji – University of Fiji, Fiji National University and The University of the South Pacific – to some extent include climate change in their programmes. However, the fourth HEI, Fulton College University has just been recently formally established as a university. Its core mission is to provide programmes that embrace a holistic approach to true education for the training of the whole[1].

Higher education has a critical role to play in educating students about global and local climate change (McCowan 2021). They are what we call the "climate change generation" or the ones who grew up with more information and less scientific uncertainty about climate change (Prasad & Mkumbachi, 2021, p. 417). Educational organisations for university-level education need to play a more critical role in preparing the next generation to face climate change challenges and prospects. HEIs must be able to support the long-term enactment of global and local climate change policies (by research, education and knowledge transfer missions). HEIs in Fiji need to play a more critical role in climate change adaptation and providing professional multidisciplinary and intersectoral skills to face this global change and societal challenge and enable indigenous communities to access clean technology to mitigate the effect of climate change (Prasad & Mkumbachi, 2021, pp. 147-148).

Research on higher education and climate change in Fiji has recently begun to be recognised as an urgency throughout Fiji since the aftermath of the regularity of cyclones and hurricanes in the region that have devastated much of Fiji in the last two decades. Recently a research study aimed at analysing and evaluating students' perceptions of climate change was carried out at USP (Prasad & Mkumbachi 2021). The result showed that there was a need to integrate climate change into the higher education curriculum and more research to be done on the topic. A number of research studies have been carried out in previous years but only in the last decade or two more have been done, many of which have been made possible through funded projects. The three universities in Fiji have undertaken projects that are continuing to engage in climate change in Fiji. However, as yet there is very little published research on higher education and climate change in Fiji. It is hoped that in the future more research will be encouraged so that HEIs in Fiji be engaged in and take on the responsibility of being advocates of climate change.

In brief, the University of Fiji's School of Science and Technology teaches and encourages research in climate change. One of the projects it is leading is the EU-funded Renewable Energy in the Pacific Islands; Developing Skills and Capacity (EPIC) project. This project is conducted in partnership with University of Alicante, Spain and the University of Papua New Guinea. An outcome of this project is the recently approved Masters in Renewable Energy Management program that is taught by the school. In addition, the school offered an online short course in Food Security and Climate Change and other community engagement activities such as the World Water Day and holds debates on climate change issues (University of Fiji, 2017). However, more can be done if more funding is provided and if there are more staff with the capacity to develop climate change curriculum or weave climate change into relevant courses.

The Centre for Climate Change; Energy, Environment and Sustainable Development (CCCEESD) at the University of Fiji has strengthened research capacity to harness sustainable development in areas of climate change, environment, energy and science and technology and also offer courses relevant to the sustainable development of Fiji and the Pacific region. They have conducted workshops and climate change seminars in collaboration with their Department of Science and the Project Survival Pacific, a youth environmental organisation in Fiji that works to safeguard the survival of the Pacific island people from the impacts of climate change and promote sustainable development within the Pacific.

Fiji National University (FNU) has in place the University's Sustainable Plan 2021 – 2026 which it will align itself to, to meet goals in four key areas that include administration, engagement, operations and education and research. For the university to become sustainable, it is essential that it must comprise the three realms of sustainable development: environmental protection, social cohesion and economic performance. (Fiji National University: Sustainability Plan, 2021 – 2026).

In addition, FNU supports academic programmes and participates in community engagement and extracurricular activities to achieve the SDGs. Some of the activities the university are involved in are clean up campaigns, tree planting, using environmentally-friendly practices in the university such as the installation of solar PV panels in its Nadi campus (Fiji National University, 2020).

A press release in May this year (2022) acknowledged FNU for being ranked highly in the Times Higher Education (THE) Impact Ranking. These rankings measure how an institution's research, stewardship, outreach and teaching deliver against the UN SDGs – a blueprint to achieving a better and more sustainable future for all. FNU opted for 3 additional SDGs as part of its 2022 submission, which were SDG 3 Good Health and Well-Being, SDG 15 Life on Land and SDG 13 Climate Action all of which were highly ranked.

Finally, The University of the South Pacific (USP) consists of three[2] faculties and institutions that weave climate change in their programmes and courses. USP has played a significant role in ESD efforts in the region being the premier tertiary educational institution. In addition, the Pacific Centre for Environment and Sustainable Development (PACE SD) was established in 1999 to

[1] Fulton Adventist University College website: www.fulton.ac.fj

[2] Faculty of Arts, Language and Education, Faculty of Business and Economics and Faculty of Science, Technology and Environment

focus on Environmental Education, Research and Community Engagement in the Pacific Island Region and since then has provided a centralized coordinated approach to the University's ESD efforts. USP is the lead agency for the promotion of ESD in higher education and through formal and non-formal education in the wider Pacific islands (Koya, 2011). To fulfil its purpose, it works with numerous local, regional and global development partners, governments and CSOs researching and educating the region on sustainable practices to mitigate and adapt to climate change to subsequently build resilient nations. Some of the projects that PACE SD is coordinating are, the European Union Global Climate Change Alliance Project (USP – EUGCCA); Pacific Technical and Vocational Education and Training (EU-PACTVET Project); Global Climate Change Alliance Plus Scaling up Pacific Adaptation (EU-GCCA +SUPA Project); Pacific Adaptation to Climate Change and Resilience Building (Intra-ACP GCCA + PACRES Project) and the Intra ACP Global Climate Change Alliance Plus Pacific Adaptation Climate Change and Resilience. USP was recognised as a UNESCO ACCU[3] Centre for Excellence in 2005 and UNU Regional Centre of expertise in ESD in 2005. The focus of these projects is to encourage the discussion and collaboration amongst climate change vulnerable states, build capacity and increase climate change adaptation strategies. Furthermore, to manage and disseminate knowledge to address climate change and disaster risk management in the Pacific (USP, 2004)

USP is one of the five partners in the Asia/Pacific Cultural Centre of UNESCO's Education for Sustainable Development Project (ACCU-ESD) and selected as a Centre of Excellence and has undertaken a project titled 'Mainstreaming ESD at USP' to enhance education-based capacity building for sustainable development in PICs. It has offered courses about climate change at both undergraduate and post-graduate levels. For instance, in the School of Law and Social Sciences (SoLaSS) a 200 level course called Human Rights at Local, National, Regional and International (DG200) is offered looking at strengths and limitations of human rights protections, of which climate change is one of the focus areas (USP Handbook & Calendar 2020, p. 478). The PaCE-SD runs 10 courses at the post-graduate level, four of which are specific to climate change. Examples are Climate Finance and Adaptation Project Design (PC412), Climate Change: Impacts, Vulnerability and Adaptation (PC414), Climate Science (PC415) and Research Projects in Climate Change (PC420) (USP Calendar & Handbook, 2020).

As indicated above, in 2010, the School of Education (USP), produced three volumes of ESD series to assist in the contextualisation of ESD within a culturally situated understanding of sustainability. Volume I comprised scholarly articles where the authors discussed local notions of sustainability and how these may inform ESD efforts. Volume II included a range of creative interpretations of sustainable living that included life stories, poetry, myths and legends, paintings and photographs, that portrayed messages and ideas of ESD across the diverse range of cultural communities in the region. Volume III was an annotated bibliography that gave details of the bibliography and summaries of literature on ESD for use at the University (Koya, 2011).

However, the institutional documentation for these three universities is silent on the percentage of the content of climate change education delivered in each of the faculties and programs. Furthermore, it does not highlight the impact of their work on students and the communities. It is vital to find these out so that gaps in the programmes and activities identified and be improved for future programme delivery and Fiji's preparedness for climate change. Overall, there are significant research needs in this area.
Higher education has also been the focus of SIDS in international meetings. The Commonwealth's initiation of the pan-Commonwealth meeting of education experts in small states that was convened in Mauritius in 1985, drew adequate attention to the needs and vulnerabilities of the small island states. Out of this Mauritius meeting, seven priority themes were seen to be common to many small states which were then incorporated into the Commonwealth Secretariat work plans. This included ongoing research, studies and management of Ministries of Education (MOEs) examination and assessment on postsecondary education (Crossley et al., 2014). This meeting inspired other organisations such as UNESCO/IIEP and other islands to engage in related work and studies. As Crossley et al. (2011) rightly state, cooperation and education are the means to addressing this.

Teacher educators in Fiji are faced with a number of challenges which either constrain or facilitate their performance in schools. Many perceive their jobs as getting more difficult. From the findings of a research study on teacher education in Fiji, the main challenges they faced were at the Ministry level, school level, teacher, the curriculum, students and the community (Crossley et al, 2017). Teachers agreed that much of the focus of their teaching was on rote learning, that the contents of the curriculum were of inferior quality and sequencing within the curriculum was irregular. Contents ranged at very high levels beyond the child's prior learning and knowledge. Crossley et al., 2017). A new curriculum is much needed in the country that will allow students to learn to live in these trying times. Higher education institutions need to address these in their courses and classes. We need to churn out qualified teachers equipped with knowledge and skills in teaching and learning of students in schools.

8. Challenges and Potential for Climate Change Education

Education reaches the mass of the young population. To ensure the young and the mass of the population in a society has access to climate information, education is the main vehicle. Hemstock et al. (2020) share the same sentiment and argues that in order to assist the society to adapt to climate change impacts, climate change education is pivotal. The United Nations Conference on Environment and Development (UNCED) in 1992, also referred to as the Rio de Janeiro Earth Summit, also recognises the important role education plays in addressing climate change and other environmental issues.

[3] Asia/Pacific Cultural Centre for UNESCO

In the UNFCCC, Article 4 addresses education in climate change directly, through the "promotion and cooperation of education through training, public awareness related to climate change and the enhancement of its widest participation of communities in the process". However, climate action is one of the SDGs, and it is acknowledged that all of the goals depend on education for their fulfilment. Furthermore, the UNFCCC prioritises building capacity to implement the convention.

However, in the Sendai Framework for Disaster Risk Reduction 2015-2030, there is a clear mandate on education. Specifically, the capacity building of the members of communities in least developed countries, SIDS, and landlocked developing countries and African countries, as well as middle-income countries need to be able to prevent and reduce disaster risks. This sits under the United Nations Office for Disaster Risk Reduction (UNDRR). Since the Pacific SIDS including Fiji are vulnerable to natural hazards, they are given the lead role to develop the vocational sector for Disaster Risk Reduction (DRR) qualifications. USP's Pacific Centre for Environment and Sustainable Development in collaboration with the Pacific Technical Vocational Education Training and Pacific Technical Further Education were funded by the EU PacTVET €6.1 million project and mandated to develop and teach courses and programmes to equip Pacific Islanders with relevant skills and knowledge to be able to mitigate and reduce the risks of disaster (Hemstock et al., 2020, Buliruarua et., al 2015).

Furthermore, it is apparent from the relevant literature provided that SIDS, PICTs and even Fiji have developed a wide array of policies in response to climate change issues. These policies outline regional and national actions on addressing climate change issues such as policies on consumer incentives to reduce carbon footprint, regulations to control carbon emissions, tax incentives for energy-efficient products and many more. As elaborate and detailed as these policies are, the main challenge is to operationalise these policies. Regional bodies and national governments need to do more to translate these policies into workable procedures and acceptable and inclusive practices. These policies need to be communicated to all relevant stakeholders, especially those on the ground at the sharp end. Government bodies and regional institutions need to enforce these treaties, taxes and regulations and ensure accountability to always be at the forefront of these policy interventions. This will help to restore public trust, implement and monitor collective action and encourage engagement in climate change education.

9. Conclusion

The influence of climate change on people's livelihood is real, dramatic and urgent and Fijians need to be prepared to adapt to the changes it brings. The differing perceptions of climate change and its impacts calls for nation-wide awareness so people are equipped with relevant knowledge and skills. Therefore, it is crucial that all levels of education include climate change in their learning and teaching content. However, according to the literature reviewed, the current Fiji National Climate Change Policy is silent about the inclusion of climate change in the school curriculum. This is worrying, as this will dictate the content of the Fiji National Curriculum. However, it is a relief to find that tertiary institutions are including climate change in their priority teaching and research activities. It is, therefore, hoped that this review will contribute to our understanding of current practice and that the Climate-U research will explore the extent of the inclusion of climate change in higher education activities while assessing its effectiveness in preparing Fijians for climate change.

These next few years are critical to long-term sustainability in the Pacific. Currently there are high levels of affirmation and commitment to sustainable development and climate change philosophies and goals. This is evident in the layers of change underway from policies to programmes in formal and non-formal education. There is, however, an urgent need for critical thinking about the best possible ways to ensure that SD and ways of dealing with climate change are prioritised in Pacific island countries. There are many challenges in the Pacific but a general lack of exchange means that there is little opportunity for shared learning experiences. Sustainable development and critical attention to climate change must be a core priority in the Pacific higher education if the region is to deal with the existential challenges ahead.

Our review also points to the importance of local knowledge, insights and personnel in framing such work as Konai Thaman concludes:

> In shifting our gaze towards the people whose livelihoods we are interested in, rather than focusing on the requirements of our benefactors or disciplines, we may find that the information we are seeking is already there—within the cultures and the people themselves, whether they are related to ways of learning, or mitigating against climate change, or judging quality education. For some of us, such a shift may amount to taking risks in an age where strategic plans, KPIs, quality assurance and other types of global concerns dominate much of the discourse in the various institutions and organisations in which we work, often devoid of the voices and perceptions of the very people we are supposed to help or teach. I suggest that taking risks should be our core business, for now anyway, if we are serious about SD in islands, big or small. (Thaman, 2019, p. 11).

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About Transforming Universities for a Changing Climate

Climate change is the most significant global challenge of our time, and many of its effects are felt most strongly in the poorest communities of the world. Higher education has a crucial role to play in responding to the climate crisis, not only in conducting research, but also through teaching, community engagement and public awareness. This study contributes to our understanding of how universities in low and middle-income countries can enhance their capacity for responding to climate change, through a focus on the cases of Brazil, Fiji, Kenya and Mozambique. In doing so, it contributes to the broader task of understanding the role of education in achieving the full set of Sustainable Development Goals.

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