

Chapter 4 – Understanding the Links between climate change and disaster management in Pacific Island Countries

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Short introduction

Many island nations, especially Pacific Island Countries (PICs), are highly vulnerable to natural disasters such as cyclones, earthquakes and floods on the other hand, and also tsunamis, landslides and droughts on the others. Recent studies have shown that the frequency of many of such disasters is increasing, along with their intensity. At least part of the problem is seen as being associated with climate change. It is therefore necessary to identify the extent to which climate variability is taking place in the Pacific, and the role played by climate-related events in the increased risks of phenomena such as cyclones, drought and others. In addition, it is important to identify needs, gaps as well as lessons learned, and to identify challenges and measures that need to be implemented in order to achieve a better integration of climate change and

disaster management in the Pacific region. This paper also provides some evidence of actions being taken by PICs in terms of climate change adaptation and disaster risk management.

Biosketch

Ms Veronika Schulte has been coordinating EU projects at a national and international level since 2004. In previous and current projects, she has dealt with issues such as renewable energy, environmental management, climate change, innovation and sustainability.

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Key words

Climate change, disaster management, Pacific region, renewable energy, Small Island developing states

Abstract

Small island developing states (SIDS) are especially vulnerable to problems associated with climate change and, of course, with disasters, for two main reasons:

- *their geographical location, in regions vulnerable to sea level rises and
- * their limited capacity to adapt, as a result of constraints in respect of access to financial resources and technologies.

This paper discusses how Pacific Island Countries (PICs) address the challenges of climate change in the Pacific region. It shows some of the empirical evidence available and outlines some of the actions currently being taken on climate change and disaster risk management in the Pacific Island States. Finally, it summarises some of the lessons learned from the Pacific region and lists some of the challenges and measures that need to be implemented in order to achieve a better integration of climate change and disaster management in the Pacific Island Countries. This paper is partly based on the experiences gained by “The Small Developing Island Renewable Energy Knowledge and Technology Transfer Network (DIREKT)”, which is a cooperation scheme involving universities from Germany, Fiji, Mauritius, Barbados, and Trinidad and Tobago. The aim of this project is to strengthen science and technology capacity in the field of renewable energy of a sample of ACP (Africa, Caribbean and Pacific) small island developing states, by means of technology transfer, information exchange and networking. The project is funded by the ACP Science and Technology Programme, an EU programme for cooperation between the European Union and the ACP region.

Introduction

The Pacific region is composed by 22 Pacific Island countries, which are scattered over one third of the globe. The total population of the South Pacific excluding Australia and New Zealand is about 8 million, half of which reside in Papua New Guinea. Agriculture, fishing and tourism are major industries in the region. Whilst the greatest challenge faced by the governments of the Pacific Island Countries remains the creation of jobs for a rapidly increasing population, environmental concerns related to the increased exploitation of natural resources are also becoming an issue.

The Pacific region is particularly exposed to the world's worst natural disasters such as earthquakes, tsunamis, cyclones and many others. Some examples of these natural disasters would include not only the 2004 Tsunami which affected most of South-East Asia, but especially the 2009 earthquake in Samoa. This earthquake generated a tsunami which affected not only Samoa, but also American Samoa and Tonga where more than 189 people were killed, especially children, most of them in Samoa (ONE News, 2009). Another example includes the 2009 flooding in Fiji that affected towns of Nadi, Labasa, Sigatoka, Ba and many rural villages on one of Fiji's main islands, Viti Levu and resulting in the death of eight people (Go-Fiji.com, n. d.).

There are some signs that the frequency of natural disasters seem to be increasing in number and size, due to a number of factors. One such factor is believed to be climate change, as it relates to disruptions in water cycles and subsequent floods or droughts.

Human activity is believed to play a major role in altering the climate and many of these activities are producing effects comparable to the natural forces that influence the climate (Trenberth *et al.*, 2000). The frequency and intensity of severe weather events such as cyclones, floods, droughts and heavy precipitation events are expected to rise even with relatively small average temperature increases and this is resulting from global warming (UNFCCC, 2007).

There is a clear link between disaster vulnerability, disaster management and climate change. This paper will therefore focus on the actions being currently taken by Pacific Island Countries (PICs) on climate change adaptation and disaster risk management. Most of the issues discussed in this paper are mostly drawn from literature research.

Identifying the consequences of climate change in the Pacific Region

Climate change is considered as one of the greatest risks to the people of Pacific Island Countries (PICs). This poses a threat to properties on the one hand, but also to livelihoods, security and welfare of the people of the Pacific on the other. Some of the most vulnerable of these PICs is shown in Figure 1, which presents an overview of the South Pacific region.

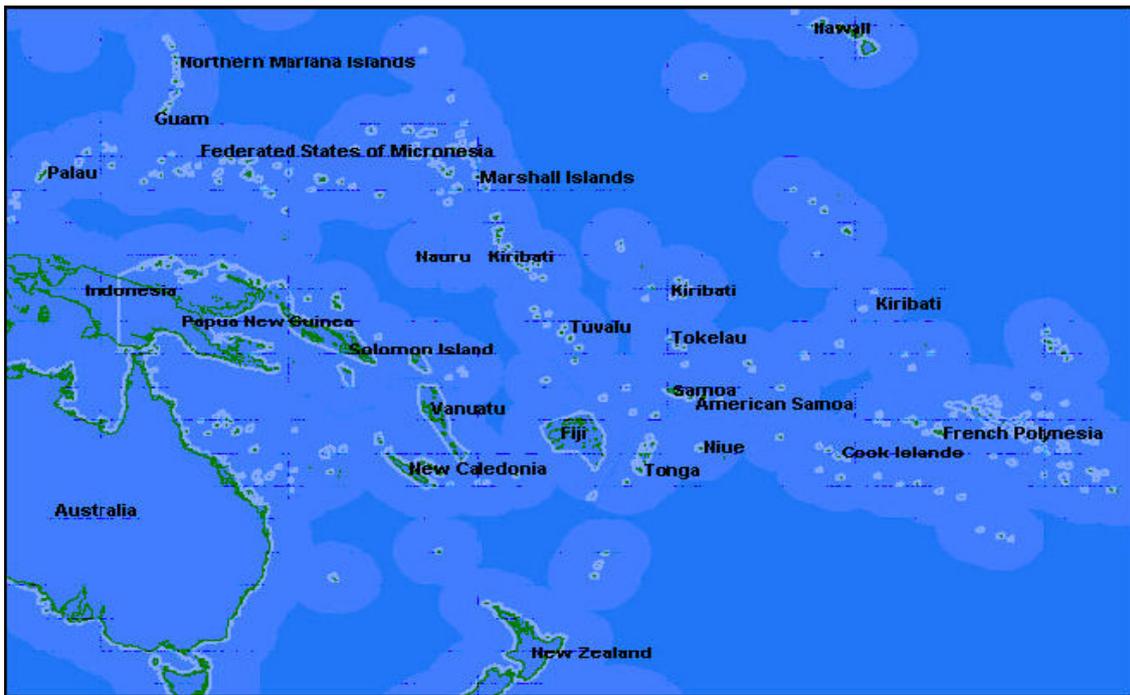


Figure 1: Map of Pacific Island Countries

(Source: http://www.whycos.org/rubrique.php3?id_rubrique=40)

The Pacific Island Forum Leaders, i.e. the leaders of a regional organization that congregates the countries in the region, have stated that if the issue of climate change is not immediately and effectively addressed the impacts from this have the potential to cause severe damage, undermine security and undo progress towards the achievement of national priorities and the Millennium Development Goals (MDGs) in the Pacific. In the Niue Declaration on Climate Change (United Nations, n. d.), the Pacific Island Forum Leaders have stated that PICs are considered to be one of the lowest contributors of factors contributing to climate change, yet they are among the most vulnerable to the impacts of climate change.

Therefore, it becomes extremely important that PICs develop ways to adapt to and address the impacts of climate change. The Pacific Islands Framework for Action on Climate Change (2006-2015) was adopted by Forum Leaders in 2005. This was essentially established to provide an integrated, programmatic approach to addressing the interlinked causes and effects of climate change-related impacts in the region (SPREP, n. d.). The goal of this framework is to build the capacity of the Pacific island people to be resilient to the risks and impacts of climate change through implementing adaptation measures; contributing to mitigation of greenhouse gas emissions; improving decision making and good governance; improving understanding of climate change and its effects; education and awareness; and developing and strengthening partnership and cooperation (SPREP, n. d.)

Many organisations, societies and people in PICs are involved in pursuing a path to sustainable development. This will ensure that PICs will be more resilient to climate change impacts. Moreover, many PICs are reducing their dependence on fossil fuels and switching to renewable energy which will lower the green house gas emission. The use of cost-effective measures that improve energy efficiency and promoting the use of low-carbon technologies have clear benefits for the region (Australian Government, 2009).

These measures together with helping reduce emissions also have other benefits, such as enhanced energy security (Australian Government, 2009).

Another way PICs have identified in addressing climate change is improving access to increased resources and the ability to effectively manage and utilize these resources. In August 2010, Forum Leaders noted the importance of sufficient, sustainable and timely resources being made available for PICs to address their needs to mitigate and adapt to climate change (Saili *et al.*, 2011). The leaders also agreed on the: i) importance of effective coordination and management of climate change resources and response efforts particularly at the national level; and ii) the need for PICs to drive the prioritization of climate change resources and activities through their national, sectoral plans and systems (Saili *et al.*, 2011).

Many developed countries and donor agencies are also working actively with the relevant organisations in the PICs in providing assistance to adapt to the impacts of climate change.

For example, the Australian Government has established the Department of Climate Change (DCC) which is actively working with AusAID in strengthening the capacity of neighbouring countries by providing information, tools and training to enable regional decision makers to identify and incorporate climate change adaptation into planning and developing strategies (Scott and Simpson, 2009). In addition, the Government of New Zealand is supporting a wide range of climate projects, and international development agencies of countries such as Germany and the United Kingdom are engaged in the provision of technical assistance.

PICs have articulated their priorities for addressing climate change in the region through the Pacific Plan for Strengthening Regional Coordination and Integration, the Niue Declaration on Climate Change and the Pacific Islands Framework for Action on Climate Change 2006-2015 and nationally through documents such as the National Adaptation Programmes of Action and the United Nations Framework Convention on Climate Change (UNFCCC) National Communications (Australian Government, 2009). These documents have the advantage of setting a framework against which action can be taken, and results can be measured.

Examples of actions currently being taken on climate change and disaster risk management in the Pacific Island Countries

As earlier stated, PICs experience some of the worst natural disasters. These include earthquakes, droughts, cyclones, floods, tsunamis, volcanic eruptions and landslides. The change in climate is believed to be influencing these natural disasters. The Intergovernmental Panel on Climate Change (IPCC, 2007) has concluded that the frequency as well as the severity of hot and cold extremes and heavy precipitation events is increasing and this trend is expected to continue. Therefore the PICs need to be prepared for the natural hazards as well as expect these events to occur more frequently and be more intense as such making them more vulnerable.

In order to be able to successfully address the issue of climate change and disaster risk management, PICs need to promote a number of measures. For example:

- in-country government arrangements demanding risk reduction considerations across all sectors;
- the promotion of community-based risk reduction initiatives through provincial and local governments, and through civil society and all stakeholder groups (World Bank, 2010);
- the relocation of some families to higher grounds; an example is Kiribati, where due to the rising sea level a number of villagers had to move their houses.

These rather simple adaptation measures may lead to protection of property, and human lives.

To date, it can be said that there is policy development and planning in most PICs towards climate change adaptation and disaster risk reduction; an example is the Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010-2015 developed in Tonga. Tonga is the first PIC in the region to develop such a document which highlights national and community priority goals and activities to be implemented to enable the people and environment of Tonga to adapt to the impacts of climate change and to mitigate disaster risks (Kingdom of Tonga, 2010).

Although there is a policy development and planning in place, in-country capacity and relevant information remain major constraints. The risk reduction action on the ground remains limited, despite major efforts by donor and stakeholder institutions at both the national and regional levels.

In the report called “Institutional and Policy Analysis of Disaster Risk Reduction and Climate Change Adaptation in Pacific Island Countries”, four pilot countries, Cook Islands (approximate population: 25.600), Fiji (approximate population: 837.271), Palau (approximate population: 21.000), Vanuatu (approximate population: 225.000) were studied in detail for institutional and policy analysis related to climate change adaptation and disaster risk reduction. The following section summarises the findings from the four PICs (Hay, 2009):

Cook Island

When looking at the level of mainstreaming of Disaster Risk Reduction and Climate Change Adaptation in development planning processes, Cook Island, on a national scale, has the National Sustainable Development Strategy (NSDS). With resilience as a goal, this allows for an integrated approach to Climate Change Adaptation/Disaster Risk Reduction. The NSDS acknowledges that investment in infrastructure, as called for in the Infrastructure Management Plan, requires effective management structures to ensure its sustainability, including guarantee of budgeting for future maintenance costs and also climate-proofing infrastructure as a safeguard against the impact of weather-related phenomena.

On the local level mainstreaming is being seen through NSDS Goal Six: a safe and resilient community. This specifically looks at enhancing community resilience to natural disasters and climate change. Many planned actions in the NSDS are expected to do this indirectly such as having several cyclone-damaged harbours and airports in the

Outer Islands prioritised for reconstruction and upgrade; construction of cyclone shelters on atolls in the Northern Group islands is also a key priority.

A National Action Plan (NAP) for Disaster Risk Management has been prepared which includes consideration of Climate Change Adaptation, but is quite limited. However, through the NAP Climate Change Adaptation and Disaster Risk Reduction are included in the national budget process with approximately 230, 000 euro set aside each year as disaster contingency fund. At the local level, ecosystem-based community resilience building projects are being implemented. Activities such as identifying priority hazards requiring attention and measures to deal with them are being incorporated in the respective Plans and Budgets. The Outer Island Councils are being trained which will enable them to make sustainable planning processes including planning for climate change.

Similarly, looking at Climate Change Adaption at the national level, a National Adaptation Plan is under preparation. A number of projects are being implemented such as water, waste and sanitation which include aspects of Climate Change Adaptation. Locally, the government works closely with NGOs, such as The Red Cross, to undertake assessments, raise awareness and implement adaptation measures. Capacity and vulnerability assessments have been conducted in seven out of the fifteen inhabited islands. Plans are in place to complete assessments in all other inhabited islands and ecosystem-based management plans are being developed for each pearl farming community.

Fiji

On the national scale, Fiji has the People's Charter for Change, Peace and Progress which outlines the need for Fiji to be environmentally sustainable. Fiji's draft Strategic Development Plan (SDP) 2007-2011 recognized the need to develop response plans and early warning systems for floods and other natural hazards. It also urged the mainstreaming of disaster risk reduction into sectoral development plans, policies and programs, noting this is crucial for sustainable development and community resilience. The Sustainable Economic and Empowerment Development Strategy (SEEDS) 2008-2010 proposes integrating disaster risk reduction into political decisions and states that Government efforts are underpinned by a "risk management approach" but no particular strategy is included to address the issue. The local focus is on community-based capacity building with the aim of reducing dependency and to achieve community resilience and sustainable development.

The key policy and planning instruments for disaster management at the national level in Fiji include the National Disaster Risk Management Act, the National Disaster Risk Management Plan, the National Disaster Risk Management Policy, Hazard Contingency Plans and Agency Support Plans. All these call for a safer and more resilient Fiji, using an all hazards approach – both natural and human-caused and the focus is disaster risk management and not just disaster management. Instruments for Disaster Risk Management in Fiji include Community Support Plans. Fiji has adopted the integrated Local Level Risk Management Approach (LLRMA). LLRM supports communities to manage and reduce disaster risk as well as foresee and control the emergence of new risks such as those related to climate change. This is done through work on local governance and community planning and preparedness, as well as through individual

participation and motivation. An Emergency Management Volunteer Service has been established whereby volunteers are provided with community-based training, including initial damage assessment and community-based Disaster Risk Management. Projects such as river bank erosion, landslide and flooding risk reduction and mitigation are being implemented. Similarly, many communities in Fiji are learning important lessons about managing the impacts of climate change; examples of local projects are Climate Witness Programmes in Kabara, Tikina Wai, building coastal resilience to climate change in Tikina Wai and strengthening community marine resources management practices through ecosystem-based management and design.

Palau

Palau has the 2020 Palau National Master Development Plan (PNMDP) which includes the priority developments of the nation including mainstreaming Disaster Risk Reduction. Palau's National Disaster Risk Management Framework has a vision of safe, resilient and prepared communities in Palau. The Government of Palau is generally committed to climate change adaptation principles and activities. However, there is a key gap in the government's understanding and reflection of the anticipated impacts of climate change extremes and variability on overall economic development, livelihood security, food security and infrastructure resilience. Similarly, on a local level there is a gap between the government's centralized climate change agenda and limited engagement and consultations with Palau's decentralized and very active environmental NGO networks and the private sector tourism industry.

The National Disaster Risk Management Framework (NDRMF) was completed in early 2010. This Framework focuses on all types of hazards, human-induced and natural; the Framework establishes a mechanism for effective control, coordination, decision-making, accountability and organizational arrangements for all aspects of disaster management and disaster risk reduction. It describes the organizational arrangements that maximize the use of available resources to strengthen mitigation, preparedness, response and relief and recovery planning based on an 'all-hazards' basis. The framework uses an integrated approach by involving all level of government, departments, sectors and communities to promote integrated planning and collaboration for disaster management and disaster risk reduction. Disaster risk reduction programs and activities are being developed and incorporated into programs that address community development and coping mechanisms in times of disasters in Palau. Relevant traditional knowledge and practices are being included in all national, state and community Disaster Risk Reduction plans.

Palau also has documents, for example the First National Communication to the *United Nations Framework Convention on Climate Change* (UNFCCC), which propose several vulnerability and adaptation strategies and actions for climate change. However, there is a surprising lack of understanding about adaptation to climate change and only a few isolated, donor-driven projects have some level of adaptation in the activities. Palau also has responsibility for environmental protection, resource management, land-use planning, and health and welfare which therefore can play a major role in terms of climate change adaptation. However, the progress in adaptation implementation process has been very slow. This is greatly attributed to the fact that lack significant administrative and operation systems independent of the national government amongst

the States in Palau except for Koror and also traditional governance systems are embedded in the country's modern governance structures.

Vanuatu

In Vanuatu, Disaster risk management has been integrated in the Priorities and Action Agenda (PAA). An important priority of this strategy is to mainstream disaster risk reduction as well as climate change measures. Another main focus of this strategy is to implement risk reduction programs in communities. Vanuatu also has a National Disaster Act (2000) which focuses primarily on preparedness and response arrangements for disasters.

Looking at climate change adaptation, a discussion paper on Climate Change Policy and Implementation Strategy has been prepared in Vanuatu. The purpose of this is to provide a summary on climate change development in Vanuatu including future areas that the government and other stakeholders need to address. The paper also determines the issues that had been identified over the years that may form the basis for a climate change policy. Finally, it looks at developing a preliminary climate change policy framework for consultation purposes. The policy paper proposes a policy framework which will mainstream climate change issues in all its environmental, social, economic, planning structures and processes for sustainable development at the national and community level.

A number of organisations are involved in disaster risk reduction as well as climate change adaptation in Vanuatu. Some examples include Vanuatu's Meteorological Department, Agriculture Department involved in disaster responses, Department of Internal Affairs that coordinates responses between provincial authorities, the National Advisory Committee of Climate Change (NACC) assists in raising awareness on disaster risk reduction through its climate change core team and the Ministry of Lands and Natural Resources which incorporates risk reduction into land, water and energy planning. The Foundation of the Peoples of the South Pacific International (FSPI) is a network of non-governmental organisations in the South Pacific. This organisation has engaged communities in Vanuatu in participatory methods of problem identification, risk analysis and action planning in Vanuatu. The initiative is for the development of people-centred early warning system and community based Disaster Risk Reduction and Disaster Risk Management plans or for safer village plans. These will be reinforced through participatory research, dissemination of the traditional and modern vulnerability reduction methods, social conditions and skills that contributes to community resilience in PICs, including Vanuatu.

Vanuatu's National Adaptation Programme of Action (NAPA) has identified agriculture and food security, sustainable tourism development, community-based marine resource management and sustainable forestry management as the priority sector. Several projects are being implemented in these priority areas; an example is the GTZ-funded and South Pacific Commission executed project focusing on sustainable agro-forestry management as a means of building resilience to climate change.

Overview of other PICs

Additionally, other PICs have also made considerable progress in addressing climate-related and other natural hazard risks. In Kiribati efforts to improve the enabling environment has been made through the two phases of the Kiribati Adaptation Project. According to the World Bank (2009) synthesis report, Solomon Islands Government has created a new, higher-level Climate Change Division and bolstering its staff and resources. The Marshall Islands has also completed National Action Plan for Disaster Risk Management.

There are other practices that are being carried out in the PICs to deal with underlying vulnerabilities and exposure to hazards. As stated in the World Bank (2009) synthesis report, in Vanuatu a village at risk from coastal flooding has been re-located and added roof water-harvesting systems against the risk of droughts. The Marshall Islands has embarked on a project to improve water-harvesting and water-quality improvements to reduce drought impact and risks to health. Papua New Guinea on the other hand, has overtly undertaken activities to reduce drought risks in the highlands by promoting crop diversification and by provision of wells in villages. Additionally, some disaster risk reduction and climate change adaptation projects in Fiji and Samoa include the Navua Local Level Risk Management Project (Fiji), World Wildlife Fund for Nature WWF Coastal Resilience (Fiji), Samoa Community Based Adaption, and many more where some are pilot projects and others form part of a global initiative (Gero *et al.*, 2010).

Although there are some activities happening in the Pacific region, most are one-off activities or pilot projects. Most of these projects are donor-funded and often driven by donors and NGOs. Evidence of long term initiatives tend to be lacking as well as more comprehensive and detailed programs of risk reduction, hence it is a necessity to focus on these for successful action of integrating climate change adaptation and disaster management.

Challenges and measures for integration of climate change and disaster management in the PICs

Identifying the challenges and measures that exist is of extreme importance. Once these challenges have been identified and implemented then integration of climate change and disaster management becomes easier and fruitful.

The following are some challenges that have been identified in integration of climate change adaptation and risk reduction the Pacific Region:

- i. better political frameworks;
- ii. increased access to adaptation technologies;
- iii. better access to funding for risk reduction, especially in living quarters known to be vulnerable;
- iv. clear sets of targets and indicators to reach them.

The World Bank (2006) policy note, “Not If, But When”, stated that countries are developing national strategies on risk reduction (through the NAP for disaster risk and/or the NAPA for climate change) at national level; however, few of these countries have actually fully implemented their national strategies on risk reduction. According to

the policy note, most PICs lack the practical measures that need to be taken to strengthen their programs against the risk of natural hazards, including climate change. An effort needs to be made in successfully implementing the strategies developed for risk reduction by PICs.

Institutional arrangements are also crucial especially at the country level. More informed decision making is possible through an effective leadership. An effective institutional arrangement at the country level is possible if there is stronger strategic and operational planning (World Bank, 2009). Most PICs require assistance and guidance in order to achieve an effective institutional arrangement.

There are potential overlaps that exist between coordination on climate change adaptation (led by environment ministries) and on disaster risk management (led by National Disaster Management Offices). If both sectors work together in developing strategies and policies, and implementing projects then a consistent and comprehensive approach emanates from complementary policies.

Another challenge that has been identified is that proactive disaster risk mitigation has attracted limited funding and that the problems are compounded by limited capacity to implement risk management activities. According to the policy note, “Not If, But When”, even though donors allocate emergency funds for disasters, they are often unable to divert them to preventive efforts. Donors need to entail risk management of natural hazards as an important component of development funding, and as a result reward countries willing to take proactive action.

Human resource capacity needs to be overcome before successful integration of climate change adaptation and disaster risk management. Often the technical assistance for projects is unsustainable and regional organizations, due to the sheer scale of the challenge, are often limited to an advisory role and some limited backstopping (World Bank, 2009). There is a general lack of in-country capacity for implementation of projects. For example, Kiribati has received donor funding over the last decade aimed at creating an enabling environment conducive to sustainable risk reduction, principally with regards to climate change adaptation. However, they lack in-country human capacity to implement these (World Bank, 2009).

Furthermore, experience has shown that stand-alone climate and disaster risk programs are often undermined by unfavourable national policies or investments. In order to be effective, climate and disaster risk management need to be incorporated into the national processes that are crucial to decision making.

The policy note concludes by pointing out that climate and disaster risk management requires an enabling national environment under which key players such as communities, government, and the private sector can implement risk-reduction behaviour.

In a report by Gero *et al.* (2010), the authors have identified the challenges of agency and the architecture that provide the greatest hurdles to the integration of climate change adaptation and disaster risk reduction in the Pacific. Agency or agents are actors with authority to make decisions and they are mostly from nongovernment sectors (Bierman, 2007). Architecture simply refers to the institutional framework that exists. Gero *et al.*

(2010) have noted that having multiple agents especially from local to global scale, makes it difficult for some organisations to find their forte without duplicating the efforts of others. Usually agents working in climate change adaptation and disaster risk reduction in the Pacific have limited time. Hence, liaising and corresponding with even more partners can be detrimental to their “other” work. Therefore, if there is a better understanding of the roles and responsibilities amongst agents, this could lead to reduced duplication and better collaboration and cooperation in the Pacific.

Similarly, Gero *et al.* (2010) have also mentioned that the different policies, funding mechanisms, separation of responsibility of climate change adaptation and disaster risk reduction via Pacific Islands Applied Geoscience Commission (SOPAC) and Pacific Regional Environment Programme (SPREP), and the overall institutional architecture have created barriers for a streamlined approach and meaningful integration of climate change adaptation and disaster risk reduction. Therefore if the challenge of architecture is overcome the Pacific can go a long way in successfully integrating climate change adaptation and disaster risk reduction as well as provide the means for better cooperation and collaboration between agents.

Summary and lessons learned from the Pacific Region in integration of Disaster Management and Climate Change Adaptation

The 2008 Global Environment Facility (GEF)-Pacific Alliance for Sustainability report on future investment programs contains a number of observations and lessons learned from the past 15 years of activity in the Pacific Region. Some of the lessons mentioned are also applicable to successful integration of disaster management and climate change adaptation. One such lesson learnt is that in-country capacity needs to be built. Preference should be given to the use of national and regional experts who have received the advanced training that allows them to play critical roles rather than getting experts from overseas. Adaptation needs to go beyond such apparent actions as building a sea wall or relocating. There needs to be awareness raising, capacity building, mainstreaming into development plans, acquiring knowledge and data, and assessing risk at all levels (World Bank, 2010).

Secondly, the report mentioned that having a robust project design, based on regional coordination and cooperation with national implementation is considered more effective and efficient. It is also noted that usually the Government lacks adequate resources to develop and maintain management and research capabilities. There is a tendency to rely quite heavily on external assistance program. This can be unsustainable in the long term.

Finally, the report summarizes barriers that have had to be addressed to meet both national aspirations and GEF requirements. These include balancing community-focused actions, country drive, regional coordination, and delivery of global benefits; programmatic versus project-based approach; national versus regional projects; planning versus action; increased absorptive capacity; limited co-financing; sharing expertise and sharing information.

Secretariat of the Pacific Community since 2003 has been implementing sustainable agricultural development programme throughout the Pacific region. According to the

ISDR (2008) report Development of Sustainable Agriculture in the Pacific programme (DSAP) employs a participatory approach to work with local farmers throughout the region to improve their food security and livelihoods thus improving their resilience to disasters and climate change. The lesson learnt through this programme is that participatory approach that assesses the needs of all members of the community is important for the successful implementation of sustainable projects. It was also stated that in order for participatory processes to be successful and be sustainable, time is required.

Conclusion

It is apparent that the changing climate and the increasing frequency of natural disasters occurring in the Pacific will have significant implications on the livelihood of many people as well as communities of PICs. Therefore, it is of utmost importance to identify needs, gaps, lessons learned and to identify challenges and measures that need to be implemented in order to achieve a better integration of climate change and disaster management in the Pacific. Most of the PICs with the support from respective governments, donors, regional and international organizations as well as regional and international intergovernmental organizations are already involved in discussions and collaborative mechanisms in ensuring that climate change adaptation and disaster risk management is being successfully integrated. Successful integration of climate change adaptation and disaster risk reduction can contribute to national development with improved response to disasters and decrease the vulnerability and hazard exposure.

With continued support and effort from respective organizations involved in climate change adaptation and disaster risk reduction in PICs it is hoped that the vulnerability faced by many communities in PICs will be reduced. But in order that this be achieved, it is important to provide them with the materials and resources they need in order to adapt.

References

Australian Government (2009), "Engaging our Pacific Neighbours on Climate Change: Australia's approach", Commonwealth Copyright, Australia, pp. 1-16. Available (June 2011) <http://www.climatechange.gov.au/>

Bierman, F. (2007), "Earth system governance as a crosscutting theme of global change research", *Global Environmental Change*, 17, 326-337

GEF - Global Environment Facility (2008), GEF - Pacific Alliance for Sustainability - Program Framework

Gero, A., Meheux, K. and Dominey-Howes, D. (2010), "Disaster risk reduction and climate change adaptation in the Pacific: The challenge of integration", In: Australian Tsunami Research Centre - Natural Hazards Research Laboratory (ed.), *Miscellaneous Report 4*, Sydney, University of New South Wales

Go-Fiji.com, n.d., Natural Disasters in Fiji. Available (August 2011) <http://www.go-fiji.com/naturaldisasters.html>

Hay, J. E. (2009), “Institutional and Policy Analysis of Disaster Risk Reduction and Climate Change Adaptation in Pacific Island Countries”, United Nations International Strategy for Disaster Reduction Secretariat - Asia and Pacific (UNISDR - AP) and the United Nations Development Programme (UNDP), pp. 13-22. Available (June 2011) <http://www.unisdr.org/we/inform/publications/18869>

IPCC (2007), “The Physical Science Basis”, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, In: Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. and Miller, H.L. (eds.), “Climate Change 2007”, Cambridge University Press, Cambridge, United Kingdom and New York, USA, pp. 996

ISDR (2008), “Gender Perspectives: Integrating Disaster Risk Reduction into Climate Change Adaptation Good Practices and Lessons Learned”, United Nations, Secretariat of the International Strategy for Disaster Reduction, Geneva, Switzerland

Kingdom of Tonga (2010), “Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010–2015”. Available (June 2011) <http://www.pacificdisaster.net/>

ONE News, Archived from the original on 02-10-2009, “Search continues, as death toll rises”. Available (August 2011) <http://tvnz.co.nz/national-news/search-continues-death-toll-rises-3045675>

Saili, C., Robbins, J., Bower, M., Olsson, B. and Chattier, P. (2011), “Solution Exchange for the Development Effectiveness Community in the Pacific”, Discussion: Effective Resourcing to Address Climate Change, pp. 1. Available (June 2011) <http://www.solutionexchange-un.net/pacific/>

Scott, G. and Simpson, A. (2009), “Disaster Risk Reduction and Climate Change Adaptation in the Australian-Pacific Region”, Eighteenth United Nations Regional Cartographic Conference for Asia and the Pacific, Bangkok, 26-29 October 2009, pp. 7. Available (May 2011) <http://www.unisdr.org/we/inform/publications/11434>

SPREP (n.d.), “Pacific Islands Action Plan on Climate Change 2006-2015”. Available (June 2011) <http://www.sprep.org/legal/documents/APClimateChange.pdf>

Trenberth, K. E., Miller, K., Mearns, L. and Rodes, S. (2000), “Effects of Changing Climate on Weather and Human Activities”, University Corporation for Atmospheric Research, Sausalito, California, pp. 14

United Nations (n.d.), “The Niue Declaration on Climate Change”. Available (August 2011) http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/cc-inputs/New_Zealand_CCIS.pdf

UNFCCC (2007), “Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries”, United Nations Framework Convention on Climate Change, Germany, pp. 8

World Bank (2006), “Not If But When: Adapting to Natural Hazards in the Pacific Islands Region”, A Policy Note, Washington, D. C.

World Bank (2009), “Preparedness, Planning, and Prevention: Assessment of National and Regional Efforts to Reduce Natural Disaster and Climate Change Risks in the Pacific – A Synthesis Report”, East Asia and the Pacific Region, Washington, D.C.

World Bank (2010), “Reducing the Risk of Disaster and Climate Vulnerability in the Pacific Islands”. Available (June 2011) <http://web.worldbank.org/>