

Understanding Gender and Climate Change in the Pacific

December 2010



This report is the result of a partnership between Monash University GLASS Research Unit and the UNESCO Office in Apia to provide a better understand of the potential impacts of climate change on Pacific women.



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Understanding Gender and Climate Change in the Pacific

Report prepared for Susan Vize at UNESCO

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EXECUTIVE SUMMARY

This preliminary report outlines the likely gendered impacts of climate change in the Pacific Island region. It is based on secondary data analysis as well as a number of informal interviews with key informants. In this report climate change is linked to both rapid onset climate events such as more frequent cyclones and storm surges as well as incremental events such as prolonged drought and sea level rise.

Significantly it must be noted that climate change events are but one aspect of a complex set of circumstances that may render Pacific Island nations particularly vulnerable to changed circumstances, and exacerbate gender inequities. Poverty, ongoing environmental concerns, poor infrastructure and less optimal disaster risk management planning also expose Island people to greater risk. An inability to produce sufficient food is already leading to food insecurity, while water security is threatened by the erosion of infrastructure and salination caused through salt water intrusion or storm surges. Thus if food prices rise in other parts of the world the Island nations will be exposed to greater food insecurity and a failure to address water infrastructure issues will also compound the effects of climate change.

It is of note that not all Island nations are as exposed to risk as others. Lower lying atolls such as Tuvalu, for example, are at greater threat from sea level rises, and many of the Island nations have developed some levels of resilience through initiatives such as tourism, providing greater income and employment opportunities.

The brief of this project is to focus particularly on the differential vulnerabilities of women and men, and the greater vulnerability of women, to climate change risks resulting from social and cultural circumstances, a lack of ownership of land, inadequate access to decision-making and responsibility for food and water security for their families. It is clear from our analysis of secondary data that there is insufficient information on the differential impacts of climate change for women and men in the Pacific Island nations and further research at village level and across nation states is needed to allow a detailed analysis. What we do know is that women are at greater risk and that their livelihoods are threatened by both rapid onset and slow onset climate events.

KEY FINDINGS

Understanding gender and climate change in the Pacific is complex and multi-layered and requires the involvement of Governments, aid organisations, transnational organisations, international, regional and local non government/civil society organisations and communities who have a critical role to play in all areas of adapting, capacity building and advocacy.

Overall this preliminary report finds that significantly more attention needs to be given to the social outcomes of climate change by all these actors/organisations and that continuing efforts to collaborate more fully should be supported.

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The report also finds that there are three specific areas, outlined below, in which coordinated efforts can address the differential gender impacts as a result of climate change and ensure both men and women are actively involved in adaptation.

1. Research gaps

- Mapping of climate change impacts should include not only environmental and economic impacts but also the social impacts such as those impacting on individual health and welfare as well as the identifying, describing and measuring the different unpaid workloads of women and men and the mapping of comparative vulnerabilities.
- Research on disaster and climate change and the impacts of gendered social structures should be progressed.
- Gender indicators and gender impact assessments need to be part of all research projects and should demonstrate an understanding of different effects of climate change and disaster on men and women, and ways to measure and analyze these.
- Mapping of emissions profiles, mitigation and adaptive capacities needs to be gender-sensitive.
- Gender experts/officers need to be part of UN, CROP¹ and other research projects and programmes relating to climate change impacts.
- Research sponsors need to ensure that gender sensitivity is part of the outcomes of research and not just the design and ensure differences between men and women are identified in baselines, and consistently addressed in research objectives, project activities, as well as outputs, outcomes and recommendations.,

2. Policy and funding

- All Government collected data needs to be disaggregated by knowledge of differences between different groups of women/girls/boys/men to inform policy development and implementation.
- All climate change initiatives need to be sensitive to the differential experiences and potential outcomes for women and men.
- Governments and NGOs need to be developing initiatives to address the short, medium and long-term impacts of climate change events.
- Climate change initiatives should seek to improve the status of women in their communities, as well as addressing immediate practical needs as this is key for sustainability and long-term poverty reduction/resilience.
- Any impacts on the changing status of women as a result of climate policies should be assessed.

¹ Council of Regional Organisations of the Pacific including SPREP, USP and SPC

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- All climate change policy responses should be subject to scrutiny of budgets to determine whether funding is being equitably shared between women and men.
- Additional funding and training is needed for women's organisations to prepare for climate change actions and responses.
- Gender training should be introduced at all levels for climate specialists, and those in policy development roles.
- Ensuring that gender impacts are assessed in all policy (known as gender mainstreaming) must be part of ongoing attention to climate change policy and implementation.
- The issue of land ownership needs to be addressed to ensure that women have adequate access to ongoing food security, as well as an asset base.

3. Participation + Representation

- Governments and Community capacity building actions should incorporate women at all stages, particularly in planning and decision making and should develop processes that ensure that women are enabled to articulate their views and that these are incorporated into policy and planning.
- Gender-sensitive entry points should be used to build adaptive capacity through not only ensuring women are involved in decision-making, but also ensuring there are processes for identifying and incorporating the views of women and that they have forums through which to articulate their views.
- The participation of women in research projects is expected as part of any ongoing funding for climate change research.
- Climate change information needs to be automatically disseminated to women and men, noting particularly the critical differences between men's and women's communication methods and networks
- Meaningful and gender-sensitive translation of climate data should be accessible to all.
- Governments, Agencies and Communities need to work together to ensure there is equitable representation of women in decision making relating to climate change mitigation and adaptation and more women in leadership positions relating to disaster response and management of recovery processes.

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INTRODUCTION

Climate change has been described as ‘the greatest moral challenge of our generation’ (Rudd 2007) – chiefly because this complex issue has been created by human actions and demands complex solutions from the global community. Yet there has been significant reluctance to act, largely because those who are the greatest contributors to greenhouse gas emissions, and hence climate change, are not necessarily at greatest risk of direct impacts on livelihoods. Conversely those communities who have contributed the least, such as the Pacific Island nations, are amongst the most vulnerable. There were high hopes for global action at the Copenhagen Climate Change Forum held in December 2009. However the forum which drew together 120 of the world’s national leaders, failed to achieve global commitment to binding targets despite strong and impassioned representation from vulnerable nations. For example, the Tuvalu delegation walked out of the Forum accusing developed nations of failing to act on rising sea levels which threaten the very survival of their island (Wilkinson 2009). Eight months later at the 41st meeting of the Pacific Island Forum held in August 2010, the final communiqué from delegates noted that climate change remained the greatest threat to Pacific Island nations’ livelihoods, security and well-being (Pacific Islands Forum Secretariat 2010).

Climate change is defined by the IPCC as *a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.*

The Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change as *a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.*

Climate change is indeed one of the world’s greatest challenges and the vulnerable position of Pacific Island nations makes this issue of extraordinary importance for ongoing analysis. However, global attention to climate change has overemphasised the economic and environmental consequences of climate change and under-valued attention to the social consequences. Because of the significant technological focus, we know a great deal about the science of climate change and are familiar with issues of potential temperature and sea level rises. We know far less about how this might affect the livelihoods of people and communities and our knowledge is even more limited in the area of understanding the differential effects of climate change on men and women.

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While we know that the Pacific Island nations are, and will be, significantly affected, this paper results from a perceived need to better understand the likely gendered impacts of climate change in the Island communities. It results from discussions between Susan Vize at UNESCO, Samoa and Professor Margaret Alston from Monash University, both of whom note the limited informed discussion on the potential gendered impacts of climate change in the Pacific.

An initial visit to Samoa was undertaken by Professor Alston in July 2010 and included discussions with various members of the Samoan community, UN employees, government employees and civil society personnel. These informal discussions inform this paper which presents an initial assessment of published literature on the likely climate impacts in the Pacific, on gender issues and on potential areas for further research and program development, particularly for women in the Pacific Island states and territories.

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THE PACIFIC REGION IN CONTEXT

The Pacific Islands region includes 22 countries and territories. Nine of these island states are independent, eight are dependent territories and five are self-governing (Barnett and Campbell 2009). The Pacific Island countries / territories fall into three sub-regions – Melanesia, Micronesia and Polynesia.



The Pacific Island nations cover a land area of 553,959 square kilometres with Papua New Guinea accounting for 83% of this (FAO 2008). It also covers 30 million square kilometres of ocean (Lane and McNaught 2009) much of it with the exception of Papua New Guinea and Fiji being within a kilometre of the sea.

The Pacific Island region is home to approximately 9.5 million people of significantly diverse cultures, speaking hundreds of different languages and living in geographically divergent areas, with most clustered in the coastal regions of the islands. A majority of people live in small, rural village areas. Per capita income is highly variable across the region and ranges from approximately \$530 in Papua New Guinea to approximately \$6,820 in Palau. The main industry base in the Pacific region revolves around natural resources and includes agricultural production and fishing. In addition up to half of the industry base in many of these island nations is now tourism. Subsistence production still dominates and most households have a vegetable garden.

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**Table 1 – Pacific Islands and Territories
(adapted from Barnett and Campbell 2009: 5)**

Groups		Population
Melanesia	Fiji Islands	839,324
	New Caledonia	246,614
	Papua New Guinea	6,473,910
	Solomon Islands	517,455
	Vanuatu	233,026
Micronesia	Federated States of Micronesia	110,443
	Guam	178,980
	Kiribati	97,231
	Marshall Islands	53,236
	Nauru	10,163
	Northern Mariana Islands	62,969
	Palau	20,279
Polynesia	American Samoa	66,107
	Cook Islands	15,537
	French Polynesia	263,267
	Niue	1,549
	Samoa	179,645
	Tokelau	1,170
	Tonga	102,724
	Tuvalu	9,729
	Wallis and Futuna	655,200
		9,498,829

Understanding the full extent of the Pacific Island nations' economic base demands an understanding of what is commonly referred to as *remittance income*. Remittance income refers to income generated by island people who migrate to countries such as New Zealand, Australia and the United States to earn income for their families. This income is largely returned to the islands and is the main economic support for many families and island nations. For example, remittance money is recognised as accounting for up to 40% of Tonga's economic base and the economies of many Pacific Island countries are highly dependent on this income (Barnett and Campbell 2009).

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In discussions with representatives from the New Zealand government working in Samoa it was suggested that New Zealand has a quota system for migrant visas enabling a regular supply of new remittance earners to go to New Zealand each year and there is some attempt to spread this equitably across families. The need to source remittance money has led to a significant out-migration from the islands, particularly of young people. Local information suggests that if people can obtain visas they will go – if this is the case, sex-disaggregated data on visa applications and successful visa holders would be useful for a more in-depth understanding of out-migration trends.

This out-migration for work has also led to a trend where many families send their children away for high school so that they can be better educated and hopefully secure one of several university scholarships on offer in Australia, New Zealand or at home in the Pacific Islands. Thus they are preparing themselves to eventually secure higher paid employment, and potentially earning higher remittance money. The need to earn remittance money thus shapes family decision-making from a young age and is of such importance to the local economy that many families rely on this income to purchase food and some family homes are being built using this money. Remittances also potentially play a significant role after natural disasters as people request support from their families overseas. Paradoxically those leaving to earn the money in a foreign country, paying rent and higher living costs may not live as well as their Island family. Of significance for this paper is that remittance money is earned by both women and men, and is more dependent on ability to move and capacity to earn income than on gender.

The other important source of income for the islands is foreign aid. This aid comes from several countries including neighbouring countries such as Australia, New Zealand and the United States. The countries also receive significant assistance through development partners such as the United Nations and CROP agencies. As a result these countries and several UN organisations have a high profile presence in the Pacific Islands.

A strong overlay on Island culture is that of religion. Visitors to the Pacific Island nations cannot help but be impressed by the number of large churches in the Islands. As well as traditional religions which have survived through the centuries, there is strong Christian dominance as a result of missionaries coming to the islands through the nineteenth and twentieth centuries. Common religions adopted by Islanders are Catholic, Methodist, Seventh Day Adventists and Mormons. Many Islanders support their churches with a proportion of their income.

Education and literacy levels in the Pacific Islands differ markedly and are difficult to source. There is some suggestion that literacy levels are improving but there are still some significant gaps, generally due to poor schooling access (EFA, 2010). Female adult literacy rates reported for Fiji are 90.5%, PNG 56% and Samoa 78.8% (Balakrishnan 2005) indicating that rates are variable across the islands. However there is some suggestion that some teachers have not been trained in teacher education programs, and even some that have not completed high school. This suggests that many Island nations may be struggling to achieve basic education standards.

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Given the exodus of young people for high school education in New Zealand and Australia, and the slow rate of their return, it may be that those who achieve a higher education standard will leave. This creates problems addressing ongoing education standards.

In summary, the Pacific Islands are a diverse group of nations and territories linked by geographical proximity, with a diverse range of cultures and languages, a strong overlay of religious observance, variable levels of education and literacy, a dominance of low income, limited industry development and a reliance on foreign aid and remittance income. Like other income-poor nations they are highly vulnerable to the potential impacts of climate change, are food and water insecure and are reliant on imports for much of their day to day survival.

CLIMATE CHANGE

Despite climate change being referred to as the ‘greatest moral challenge of our time’ (Rudd 2007) and as the ‘greatest and widest ranging market failure ever seen’ (Smith 2006; Stern 2006), there has been limited, concerted global attention to the issue. Almost reluctantly, efforts by governments around the world to address climate change challenges have slowly escalated largely because it has the capacity to reduce economic growth, exacerbate food insecurity, increase global poverty and impede progress towards achievement of the Millennium Development Goals (AusAid 2010).

Climate change results from a build up of greenhouse gases in the atmosphere and is a consequence of the burning of fossil fuels and deforestation (McMichael 2003). Greenhouse gas emissions have increased by over 70% since the 1970s (IPCC 2007) and there are predictions of large increases in coming decades. Climate change has resulted in melting of the ice caps, rising temperatures and sea levels, changing weather patterns, including more frequent droughts and extreme weather events. Even small increases in global warming have the capacity to significantly impact global ecosystems and food production.

International concern in the 1980s led to the United Nations establishing the Intergovernmental Panel on Climate Change in 1988 to assess the scientific realities and what needed to be done to address the build up of greenhouse gases. The IPCC has produced a number of reports since their establishment. They predict warmer weather over most of the world’s land masses, more frequent hot days, an increase in heat waves, a rise in high precipitation events, an increase in droughts, an increase in intense cyclonic activity and a rise in sea levels (IPCC 2007). The IPCC’s work in raising the profile on this significant issue led to the award of the Nobel Peace Prize in 2007.

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Two divergent responses to climate change are mitigation strategies – or reducing as much as possible the effects of climate change – and adaptation strategies - which include assisting people to respond to inevitable change. In the context of the Island nations, mitigation strategies might include growing more traditional foods, building barriers to reduce the impacts of storm surges and monitoring extreme weather events. Adaptation strategies might include moving low-lying villages to higher ground, changing cropping patterns and reducing cropping in coastal regions.

Of note is that island men and women have successfully used their environmental knowledge to mitigate disasters for generations, using techniques such as food preservation, housing construction, traditional systems of exchange and managing the environment (Lane and McNaught 2009: 69). However it is also noteworthy that in more recent times local people are resisting a return to the staple famine foods of the past because these are harder to grow and prepare and traditional knowledge is being lost (Möhlendick, 2010). It is also much simpler to buy imported rice and wheat. Those advocating the growing of traditional foods as an adaptation strategy must note this resistance to a return to traditional foods.

It is also important to note the difference between coping and adapting – the UNFPA (2009) notes that many countries are coping with climate change but not adapting in positive ways. Any ongoing attention to adaptation in the Islands must ensure that people are adapting in proactive ways rather than simply coping as best they can with uncertain conditions.

Internationally the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1997 and nations were urged to sign up to reducing greenhouse gas emissions in what has become known as the Kyoto Protocol. Many countries have signed on to Kyoto. However attempts to commit countries to binding targets aimed at reducing greenhouse gas emissions faltered at the United Nations Climate Change Conference held in Copenhagen in December, 2009. Despite the conference being widely supported, and attended by 120 heads of governments, it failed to achieve its goal of a binding agreement on the reduction of global greenhouse gas emissions. Conflicts occurred between developed and developing nations and there was reluctance from countries such as the United States and Australia to adopt significant reduction targets. Pacific Island nations were strongly supportive of binding agreements arguing that a failure to act could see their islands disappear under rising sea levels.

An important point to consider in conjunction with any discussion of climate change is that the world population is rising and is predicted to rise further from 6 billion to 9 billion by 2050 (UNFPA nd). This significantly increased population, in conjunction with a more variable climate and a rise in the number of extreme weather events, has the potential to further destabilise global food and water security.

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There is general agreement that the poorest, most vulnerable countries are most at risk from climate change (The World Bank 2010) and that the small island states are amongst the most vulnerable (IPCC 2007). The Pacific Islands are particularly vulnerable to the effects of climate change because of their exposure to sea level rises, extreme weather events, rising land and sea temperatures, increased droughts, floods and extreme weather events, but also because of their tenuous livelihoods and dependence on agricultural production and fishing. Because a majority of the population lives around the coastline, this makes island people particularly vulnerable to sea level rises and extreme weather events, events that are predicted to become more frequent. In the 2009 tsunami, 158 people were killed in Samoa alone because their villages were on low-lying coastal land.

While there are limited studies on the impacts of climate change in the Pacific Island nations, Barnett and Campbell (2009) outline the following potential impacts including four major trends:

- a projected rise in temperatures including sea-surface temperature rises affecting delicate ecosystems;
- more intense rainfall /tropical storms and paradoxically less frequent storms;
- rises in sea level; and
- changes in regional climate systems which may cause droughts and food shortages.

Examples of these trends may already be emerging. For example Tuvalu is one island that has experienced declining rainfall and some islands such as the Marshall Islands and Vanuatu have salinisation of fertile soils as a result of storm surges reducing their productivity (Lane and McNaught 2009). The cost of extreme or catastrophic events is and will be significant. For example the cost of extreme events in the Pacific region in the 1990s is estimated at \$1 billion (Bettencourt and Warrick 2000 quoted in FAO 2008b). This included cyclones Ofa, Val, Heta and Gene which resulted in lost production and destruction of infrastructure. The 2009 tsunami also resulted in significant loss of life, a high injury toll, slow post-disaster recovery and significant loss of infrastructure. It exposed the lack of preparedness in the Islands for major disaster events and post-disaster recovery planning. One study conducted by South Pacific and Pacific Island Applied Geoscience Commission (SOPAC) reported in 2005 that there were serious problems with disaster planning, response and risk management, including too few staff and resources, no systematic collection of data on disasters and little integration of disaster risk management in national planning (Oxfam 2009).

In addition food and water security are under threat from climatic changes. Agricultural production is and will be affected by the loss of coastal land, contamination of groundwater, and losses due to extreme weather events, heat stress and drought. Approximately 70% of agricultural crops are reliant on summer rainfall (FAO 2008). However predicted changes in seasonal rainfall patterns have and will

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have a significant impact on both agricultural export income as well as subsistence production. Examples already exist of significant losses due to climate change. For example Fiji's sugar cane crop was wiped out in 1997-8 through drought and the 1990 cyclone Ofa reduced Niue from an exporting nation to a nation dependent on food imports (FAO 2008).

At the same time, fishing is likely to be destabilised by changes to fish habitats, sea temperature rises changing delicate ecosystems, over-fishing and general loss of a traditional source of food security. Island people will also be affected by a predicted rise in mosquito borne diseases, heat stress and injuries in extreme weather events. Coastal flooding, salination and erosion will increase with major tropical storm activity (FAO 2008).

In addition to climate change predictions, environmental problems are already being caused by:

- inadequate waste management leading to land and water pollution;
- land degradation resulting from deforestation and intensive agriculture leading to silting of rivers and lagoons;
- coastal degradation caused by overfishing, removal of mangroves and tourism leading to loss of biodiversity, increased coastal erosion and loss of habitat;
- freshwater degradation caused by deforestation, overuse of ground water, increased demand leading to reduced water quality; and
- reduction of biodiversity caused by deforestation, agricultural development, pest infestations, mangrove clearing, sedimentation, pollution leading to ecological, economic and cultural erosion (from Barnett and Campbell 2009: 43-4).

In combination with climate change events, this environmental degradation threatens to significantly destabilise food and water security in the Islands.

Globally it is understood that food and water insecurity will lead to mass migrations of people from areas most significantly affected. For example predictions are that up to 250 million people in sub-Saharan Africa may have to move by 2050 because of increasing drought and desertification and loss of agricultural production and water security. In the Asia-Pacific region, an area extending beyond the Pacific Island nations, Oxfam (2009) warns that there may be as many as 75 million people forced to leave their homes by 2050. Many parts of the Pacific region have already experienced flooding which may be in part due to sea level rises leaving water resources and productive soil compromised by sea water. More intense cyclones and storm surges are predicted. Droughts are already a feature of island agriculture with low rainfall impacting on staple crop production. Thus it may be that some Island people will need to move inland or away from their island states and territories as climate change events progress. Some island nations such as Kiribati, comprised mainly of low lying atolls, are already considering relocation of their people.

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Of concern is that the Pacific Island countries are already food insecure as they import a large proportion of their food from elsewhere. Rice and wheat for flour have replaced many traditional foods such as taro and yams. This has created a significant problem with nutrition and poor diet as much of the food consumed is processed. The World Health Organisation (2010) notes that in at least ten of the Pacific Island nations over 50% (and up to 90%) of people are overweight. Obesity is a significant problem caused by poor nutrition and a diet rich in processed foods, and has resulted in the Pacific Islands having one of the highest rates of diabetes in the world ranging from 14% to 47% across the islands. WHO research reveals that more than one-fifth of children and pregnant women are anaemic, and that iodine deficiency and goitre are endemic in PNG, Vanuatu and Fiji.

Not only does this dietary change from traditional to imported food represent a significant health crisis, there is an emerging issue of food insecurity in these Pacific Island nations – if global food prices rise as they are predicted to do, the cost of imported food in the islands will rise, and quite possibly quickly and substantially creating a major stress relating to food security and diet.

Simatupang and Stoltz (2000) predict that food security is of more serious concern at household level than at the national level. The Pacific Food Summit held in Vanuatu in 2010 endorsed a seven point framework for action on food security. The final report (FAO/SPC/UNICEF/WHO/PIFS 2010: 1) notes Pacific Island nations are particularly vulnerable to food price rises, are over-reliant on imported food, have insecure food supply and are thus, paradoxically given the high levels of obesity, at greater risk of malnutrition.

The impact of climate change on health is of major concern globally. In the island nations there is likely to be an increase in mosquito borne diseases like malaria and dengue fever.

The Pacific Island nations also import nearly all of their fuel, making them increasingly vulnerable to changes in fuel prices and highly vulnerable in relation to a potential peak oil crisis. This reliance on imported fuel may in the future lead to difficulties associated with transport, food production and electrification of houses. With rising temperatures predicted this is another potential source of concern for the islands.

Paradoxically given that these islands are surrounded by oceans, water security is a critical emerging issue. This is a result of drought periods, the silting of water sources, old infrastructure and climatic events such as cyclones and storm surges contaminating waterways. Water problems are also responsible for interference with hydro-power plants and local informants suggest this has resulted in intermittent power cuts, sometimes for days and weeks at a time. Samoa's Second National Communication to the UNFCCC (2010) notes that mitigation and adaptation strategies in place include water rationing during dry periods and an increase in water storage facilities.

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Those in village communities are the most vulnerable because of the potential loss or damage to property, unstable water supply and quality of water, damage to crops, coastal erosion and flooding of low-lying areas, and impacts on cultural and heritage values (NTT 2005). Growing urban populations have a high reliance on infrastructure, and where this fails have limited or no access to alternative water, energy or food supplies.

In summary the Pacific Island Nations will experience significant environmental, economic and social consequences of climate change arising from climate change. Environmental consequences may include:

- natural disasters which will result in crop damage, infrastructure destabilisation, water resource contamination and loss of life / safety issues;
- sea level rises which will result in coastal erosion, saline inundation, reduced soil and water quality and damage to crops and health;
- rainfall variability which will result in floods or droughts, water scarcity and damage to crops and health; and temperature rises impacting on crops and health.

Economic consequences of climate change for the Island Nations may include:

- greater food insecurity as a result of
 - natural disasters,
 - the loss of productive areas and soil quality,
 - household relocation and consequent land rights issues,
 - a decline in coastal fisheries and
 - water insecurity;
- impacts on livelihoods as a result of
 - food insecurity,
 - loss of income as a result of crop damage, loss of fisheries, tourism impacts, deforestation, and
 - health impacts,
 - infrastructure impacts in relation to transport and electricity.

Social consequences may include:

- health issues as a result of
 - airborne diseases,
 - higher temperatures,
 - greater food and water insecurity,
 - relocation issues,
 - declining infrastructure;
- education impacts as a result of
 - relocation and instability of migration,
 - lower standards of education for professionals still based on the islands,
 - declining infrastructure,

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- variable access to employment as a result of
 - destabilisation of traditional agricultural industries and tourism,
 - out-migration,
 - lower levels of investment as a result of uncertainty;
- safety impacts of disasters as a result of
 - rape, trafficking and other protection risks which increase after natural disasters,
 - contamination of water sources, and
 - the risk of physical injury as a result of debris.

In summing up the impact of climate change on the Pacific region and required actions, the FAO (2008: 13) notes

- that climate change will impact negatively on agriculture and food security in the Pacific;
- that there is a need to support agricultural producers to adapt their food production to changing climatic conditions;
- that limited human adaptive capacity highlights the need for capacity building activities;
- that information on climate change to governments and communities is lacking;
- that a coordinated approach is necessary;
- that solutions must fit with local human capacity and culture;
- that the potential exists for aquaculture development to shore up food security; and
- that development funds are needed to assist.

UNDP (2007: 8) reports similar needs to build adaptive capacity. Specifically they argue for the need to:

- enhance the capacity to monitor climate risks and to issue early warnings;
- to build adaptive capacity in agricultural production;
- to strengthen the health sector in order to reduce the health impacts of climate events; and
- to enhance knowledge transfer capabilities.

Hay and Sueasi (2006) add that reducing the vulnerability of island people also requires training for village leaders, including the women's committee, to understand and to integrate adaptive behaviours.

There are several research organisations working on climate change in the Pacific Islands. These include the Association of South Pacific Environmental Institutions initiative – a grouping of tertiary institutions in the islands – which reported on climate change in the 1980s and 1990s; the Secretariat of the Pacific Regional Environment Programme (SPREP) which is the focal point for climate change

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activities; and START-Oceania which conducts climate change research in the Pacific. Nonetheless the Fourth Assessment report of the IPCC (2007) notes that there are significant gaps in understanding the impacts of climate change in the Pacific, including demographic and socio-economic gaps –

The understanding of adaptive capacity and adaptation options is still at an early stage of development ... there is a need for further research, including the assessment of practical outcomes that enhance adaptive capacity and resilience (Mimura et al 2007: 711-12)

The Pacific Island Forum leaders noted in a 2008 communique their urgent need to secure funding to build adaptive capacity and enhance resilience (Oxfam 2009). Tuvalu Prime Minister, Apisai Ielemia argued in a speech to the UN General Assembly:

We strongly believe that it is the political and moral responsibility of the world ... to save small islands and countries like Tuvalu from climate change, and ensure we continue to live in our home islands with long-term security, cultural identity, and fundamental human dignity. (Oxfam 2009: 34)

Barnett and Campbell (2009) highlight three themes in climate change research in the Pacific. The first is the inside / outside nature of knowledge with much of the research being conducted by outsiders with limited knowledge of local processes and culture. Thus this work privileges scientific knowledge at the expense of a critical understanding of the socially diverse nature of the islands and the adaptive capacities of divergent groups. It also gives the impression of high levels of vulnerability and limited adaptive capacity. Further, the scientific knowledge generated through these outsider studies becomes virtually unintelligible to local people searching for appropriate ways of moving forward.

The second theme they identify is the top-down nature of solutions. Very little emphasis or support has been given to developing village level solutions that empower and engage local people. Significant amounts of aid money will be ineffectual if it is not targeted appropriately. Alerting people at local level to climate change risks and their need to adapt in positive ways and build community capacity should be a high level priority for funding.

The third theme is that of climate exceptionalism – that is that the intense focus on the scientific nature of the research removes the information from its social, cultural, economic and environmental context. They therefore argue that community based approaches are far more successful at achieving positive change. Concluding their noteworthy work Barnett and Campbell (2009: 184) argue:

Climate change poses a new level of risk that not all [Pacific Island] communities will be able to manage. The challenge to the region is to adapt to sustain their needs and rights and values, and the challenge to the international community is to reduce emissions to the extent that such adaptation is able to be effective, and to support communities in the Pacific to adapt in ways that they see fit. This is possible and anything less is unacceptable.

GENDER AND CLIMATE CHANGE

There is no doubt that climate change is significantly impacting vulnerable people. Emerging international research now also recognises that gender shapes vulnerability and therefore one's capacity to adapt to change, whether it is to catastrophic or incremental climate change. Gender refers to the way we operate in the world as masculine or feminine, filtered by the constraints of social norms and practices, and aided by institutions such as the church, the law and the family. Women are more constrained by these normative processes and, because they represent up to 70% of the world's poor (CBD, UNEP, IUCN 2007), are more vulnerable to climate impacts. Women are less likely to own land and resources needed for food production, and, as water becomes a valuable tradable commodity, they are less likely to own and control this precious resource. Their enhanced vulnerability results largely from poverty, cultural norms and vulnerability to disasters (IPCC 2007; FAO 2007).

Women are particularly vulnerable to gender based inequalities and yet are far less likely to be represented in forums where decisions relating to climate change are made. Thus there is increasing recognition that climate change will have variable gendered impacts (FAO 2007; Alber 2011) and that, particularly poor rural women, may be most severely impacted (Alber 2011). Women own less than 15% of land making them particularly vulnerable to food and water insecurity (UNFPA 2009).

Significant research analyzing the gendered impacts of several years of disasters reveals that women are up to fourteen times more likely to die in disasters (Neumayer and Pluemper 2007). Data shows that 90% of those who died in the 1990 Bangladeshi floods were women and up to 75% of those killed by the 2004 tsunami were women. There is also evidence that women were more severely affected by the 2003 European heat wave and Hurricane Katrina in the US (Terry 2009). These differences are not necessarily related to strength/weakness. There are a number of reasons for this differentiation including that women are more likely to be rescuing children, that their dress limits their movements, that they have not been taught to swim and that they may be culturally compelled to stay within the household unless accompanied by a male relative. There is also evidence that women are very vulnerable in post-disaster recovery if forced to stay in shelters where they are exposed to rape, harassment, discrimination and violence and have limited access to reproductive health services. There is also some evidence young women may be trafficked from these shelters.

Indirect gender impacts post-disaster also include:

- higher work burdens for women in caring for the sick and injured;
- malnutrition as they prioritise food for husbands and children;
- mental health factors associated with trauma;
- loss of income . Already there are indications of gendered employment outcomes with some women previously employed in tourism now unemployed and men more likely to be employed in post-disaster reconstruction;

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- inadequate support for female-headed households;
- increase in maternal and infant mortality;
- gender-insensitive reconstructive policies;
- an increase in women's workloads;
- deterioration of women's working conditions more than men's;
- slower economic recovery for women; and
- differential migration patterns (Alber 2011; Lambrou and Piana 2006; Lambrou and Nelson 2010).

There is also evidence that women are differentially impacted by incremental climate events such as drought. More than 2 billion people are reliant on fuels such as wood, dung and crop residues for their energy sources (FAO 2006).

Women and girls in drought affected areas now have to work harder and go further in search of fuel and water, resulting in many young girls dropping out of school in order to undertake these tasks. Research indicates that women and men in developed and developing countries often migrate away from home for work and that this impacts on relationships and the stability of families and may be responsible for the spread of HIV&AIDS. Declining food and water security is also seen to differentially impact women and men, with poor women more likely to suffer. There are health issues which affect women and men – including the much publicized issue of mental health impacts on farm men, and the health related impacts of poor diet and obesity in the Island nations. Women experiencing drought impacts are more likely than men to note health impacts, while men are more likely to note the impacts on agricultural production (Lambrou and Nelson 2010; Alston, Whittenbury and Dowling in press).

Yet because social concerns relating to climate change are not given the same attention as economic and environmental concerns by the UNFCCC and the Kyoto Protocol, issues such as poverty, health, welfare and differential gender impacts are missing from international discussions. Current attention to mitigation and adaptation strategies at national levels can be bogged down in technical and economic solutions such as carbon emissions trading, carbon sequestration and alternative energy sources - discussions that are difficult to invest with a gender focus. This attention renders women virtually invisible because of their lack of ownership of resources and their limited access to land, credit and information. Women's livelihood options are more limited than men's because of a lack of access to capital, gender norms and heavy reproductive work loads. Thus they are often bypassed in discussions of climate change at national and international levels.

Disquiet about this lack of attention, led to the development of GenderCC – women for Climate Justice at the Bali Climate Change Conference in 2007 as women-focused NGOs demanded attention to gender issues. GenderCC's slogan is 'no climate justice without gender justice'. A second transnational organization, the Global Gender and Climate Alliance was also formed to incorporate several NGOs and UN agencies and the Women's Environment and Development Organisation (WEDO). These organizations are working particularly to raise attention to the differential impacts of climate change on women.

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The United Nations Population Fund (UNFPA) has also entered this space, publishing *Facing a Changing World: Women, Population and Climate* in 2009. This book argues the need to invest climate change negotiations with knowledge of population dynamics, gender relation, reproductive health, women's well-being and access to services.

The urgent attention to incorporating gender concerns is as much about equity and fairness as it is about better environmental outcomes. For example, FAO (2009) notes that countries with greater gender equity have better environmental outcomes. This is because women depend on communal resources such as forests and waterways for subsistence needs – thus the preservation of these are important to their very survival. They collect water and firewood on a daily basis and so are highly dependent on accessible water and fuel resources and would see deforestation as a threat to survival and act accordingly.

Many countries, including those in the Pacific Islands are now developing National Adaptation Programmes of Action (NAPAs). These Programmes of Action need to be subject to gender-budgeting 'to ensure poor women's interests and priorities are not overlooked' (Terry 2009 :12) and that they are not bypassed in relation to training, information dissemination, giving expert indigenous advice and capacity building. Thus it is critical to ensure that actions addressing climate change mitigation and adaptation are sensitive to gender differences and that both women and men are incorporated in planning and development for a more secure future.

GENDER AND CLIMATE CHANGE IN THE PACIFIC

As elsewhere in the world, women and men in the Pacific region are differentially impacted by climate change. It is noteworthy that respected leaders are aware of the critical role of women and the need to incorporate them as critical players in climate change adaptations. Speaking in 2008 at the 52nd session of the Commission for the Status of Women in New York, the Hon Amberoti Nikora, the Kiribati Minister for Internal and Social Affairs on behalf of the Pacific Islands group, noted the need for gender to be central to climate change negotiations. He argued for actions aimed at the gendered impacts in energy, water, food security, agriculture and fisheries, biodiversity services, health, and disaster risk management and for women's traditional knowledge and practices to be part of the development of new technologies to address climate change (Lane and McNaught 2009; UNDP and AusAid 2008). It is widely acknowledged that rural women in the Pacific Island states play a crucial role in food security through food production, buying and preparing available and nutritious food. Nonetheless their work is carried out under significant social and cultural constraints (Balakrishnan 2005). Nonetheless gender equality gains are more evident in urban than rural populations.

In February 2008 representatives from ten Pacific Island nations, together with civil society and NGO representatives attended the forum on the Gendered Dimensions of Disaster Risk Management and Adaptation to Climate Change. This forum noted that traditional early warning systems in relation to disasters are becoming less effective

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with climate change and highlighted the need to ensure that women and men are part of the planning and development of disaster risk planning and adaptation. There is increasing evidence from across the globe that women and men take different roles in preparing for disasters. Lane and McNaught (2009: 71-2) note that women are more likely to be responsible for the practical preparation of the household, informing family members, storing food and water, and protecting family belongings. Men are more likely to liaise with government officials, prepare the outside of buildings, make decisions about evacuation and timing, manage water resources, distribute emergency relief and receive and disseminate early warnings to the community.

In addition there is increasing evidence that women are far more vulnerable following disasters. In the Pacific Island context there is evidence from the 2009 tsunami indicating gendered consequences of the disaster. For example, women employed in the Sea Breeze tourist resort were unemployed following the destruction of the facility. Men on the other hand were re-employed in reconstruction work. In addition, when residents whose homes were destroyed by the tsunami moved their homes to higher ground, there was insufficient infrastructure in the new areas – no roads, streetlights or school buses. This has made conditions very unsafe for women and children. There was additional concern about unaccompanied minors whose parents were killed or injured being inadequately monitored following the disaster.

Gendered assessments of Island states' responsiveness to climate change must incorporate an understanding of local culture. There are some elements of cultural responsiveness that are highly disadvantageous to women. For example, as in other countries, violence against women is a significant issue in the Island nations, as is HIV&AIDS and its link to sex-based violence against women, particularly in PNG. This is not to suggest a cultural basis for violence against women, but rather to indicate its prevalence and the way that traditional roles of women and men are often called on to excuse this violence. An Asia-Pacific consultation on culture and violence (APWLD 2006) notes that there are linkages between culture and the violations of women's human rights. Any suggestion that this is culturally acceptable practice should not be tolerated. Apart from the significant human rights violation this represents, violence limits women's ability to access sustainable livelihoods, reduces their ability to respond effectively to change and limits their autonomy and input to decision-making. Climate change events such as the tsunami lead to immediate and critical destabilisation of people's lives, loss of homes and livelihoods. These events have the capacity to exacerbate violence against women. Such data is emerging from other sites where women are found to be vulnerable in post-disaster crisis situations. Understanding violence against women in the context of climate change is a critical aspect of future studies in this area.

Despite being widespread, the violence against women that is now emerging as an issue of concern within the Island states is quite different to traditional sources of violence based on inter-tribal rivalries. Violence against women in the Islands mirrors that in other countries where inequitable power is a factor. However there is some suggestion that women who have been victims of sexual violence and are suffering

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significant poverty are making attempts to sell babies that result from the violence (March 2010). The growing realisation of the issue of gender based violence has led to data now being collected. For example, the Samoan police have recently established domestic violence unit. However family violence is still viewed across the islands as a private matter to be sorted out within families.

An increase in gender based violence has been reported in other disaster sites such as areas affected by Hurricane Katrina in the US and disaster affected areas in Haiti. In these areas rape and violence against women has increased. A particular concern is the rising level of HIV and AIDS amongst women in the Islands and this may be related to gender based violence. Related to the rise in gender based violence is the declining status of women, particularly noted in PNG (Brouwer et al 1998, Sepoe 2000). Post-disaster recovery plans must accommodate safety issues for women and children.

Health issues are also of concern and there is evidence that water-borne diseases are affecting infant mortality in the Island nations. Current under-five mortality statistics vary across the islands but suggest there are significant health issues for young children and that infant mortality is very high in several islands (EFA 2010) Drawing on existing research the likely impacts for women in Pacific Island Nations include:

- greater likelihood of deaths and injury during natural disasters;
- a greater role in caring for sick and injured;
- a greater role caring for sick children especially in relation to water-borne disease;
- a greater role in caring for elderly especially in relation to respiratory disease;
- greater likelihood of violence against women and breakdown of societal protections following disasters and climate events;
- disproportional protection risks after natural disasters as evidenced by rapes in Haiti and the harassment of girls in camps after the Samoan tsunami;
- the greater likelihood of loss employment in tourism and less post-reconstruction employment opportunities;
- a greater likelihood that women will lose land rights;
- a higher rate of malnutrition as women tend to eat last;
- a greater burden of work collecting water and a greater likelihood they will have to walk further for water;
- a heavier work burden collecting fuel;
- fewer roles in reconstruction and in post-disaster reconstruction aid or decision-making;
- fewer new employment opportunities
- a greater loss of status due to declining participation in post-reconstruction, higher levels of violence, and a loss of basic freedoms;
- a lack of participation in household/community decision-making;
- rising levels of domestic violence;
- out-migration outcomes as men are more likely to leave in post-reconstruction period leading to high levels of stress for women who stay;
- a loss of traditional women's knowledge and this a loss of status; and
- declining socio-cultural cohesion of communities which have been disrupted/changed by climate change impacts.

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A useful framework for understanding these impacts is that developed by the Nossal Institute for Public Health in their report on the impacts of Climate Change in the Pacific on Children. They isolate four categories of impact which are equally relevant to women. They are impacts relating to:

- Survival
 - Health
 - Water and sanitation
 - Food and nutrition
 - HIV and Aids
 - Mental health
 - Stress on health services
- Development
 - Education
 - Natural disasters
 - Displacement and labour mobility
- Protection
 - Protection from rape, assault and trafficking
 - Safe shelter
- Participation
 - Roles in decision-making on climate change to ensure the voice of women is heard
 - Participation in disaster responses and reconstruction. (Adapted from Nossal Report 2010)

Several studies already undertaken in the Pacific and elsewhere reveal the critical importance of gender. The AusAID funded Climate Change Adaptation project, as with other AusAID projects notes the need to include gender in any assessment of power relations at village level. The Red Cross funded Preparedness for Climate Change Program also notes the importance of gender analysis in ongoing research. This project highlighted the way women are often excluded from formal decision-making processes, and this does not vary when the issue discussed relates to climate change and sustainability and yet it is women who are more likely to bear greater negative impacts from resource degradation and disasters (Lane and McNaught 2009).

In developing adaptive responses and planning ongoing gendered assessments, the UN Pacific gender group chaired by Elizabeth Cox of UNIFEM and including representatives of UNFPA, UNICEF, Human Rights, UNDP, ILO and UNESCO provides a useful focus. The group's objective is to ensure gender is included in projects and provides support for groups to include gender sensitive material. As yet the practice of utilising the group in project design is mainly limited to those projects that have a gendered focus. There is a need to provide a QA mechanism across the board to all UN projects. Other agencies, donors, national Governments and NGOs could also learn from this experience and develop gender review processes.

While there are several women's groups operating in the island states, they tend to be under-funded and this restricts their capacity to mobilise. One largely voluntary victim support NGO operates in Samoa, and this organisation was active in the post-disaster period following the tsunami.

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Another organisation is the Women in Business organisation which assists women into small enterprises and provides a useful focus for the exchange of information. In Samoa there are women's leaders in the villages. Similar groups exist in many other Pacific countries. These existing organisations and structures should be supported and further funded to provide the basis for capacity building for women, for information dissemination and for post-disaster recovery planning and action. However it is important to note that these organisations have developed with a particular mandate and extending their brief may not fully address the gendered impacts of climate change. It may be more useful to establish new organisations tasked with addressing the outcomes of the very complex interaction of environmental, economic and social issues that create differential gendered outcomes.

There is no doubt that women and men are differentially impacted by climate change in the Pacific Island nations as elsewhere. This results from the different roles they adopt in the household, in food production and preparation and in post-disaster response. As well there are critical issues that make a gendered analysis of ongoing adaptations mandatory for the island nations and territories. These include food and water insecurity, poor diet and health outcomes, issues that disadvantage women such as an acceptance of violence against women, cultural structures that vest decision making powers in a predominantly male hierarchy, which limits women's access to information, and disempowerment of women through inadequate access to productive land and resources and reduced ability to positively adapt. The focus of climate change research on the science and technological aspects reduces attention to the social impacts and also reduces the ability of people to respond effectively within their cultural context.

Positive adaptive responses are also reliant on an adequate assessment of women's and men's traditional expert knowledge. Women and men have far greater understanding of their island environments than outsider experts. Capturing and building on the knowledge of local people is essential to capacity building and positive adaptation.

There is no doubt that there are widespread gender differences in coping and adaptation behaviour resulting from climate change and that women in the Pacific Island nations are more vulnerable following disasters and climate events. A complex interplay of circumstances shapes a person's responsiveness to climate change. Central to the increased vulnerability of women are their levels of poverty, their health and that of their children, and their capacity to adopt strategies to cope with increased food and water security. Inequitable power relations, resource ownership and gender based violence will ensure that women remain increasingly vulnerable unless gender becomes a transparent factor in climate change planning, adaptations and research.

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