CASE STUDY 2-4

IMPLEMENTING ADAPTATION MEASURES

Enhancing Resilience of Coastal Communities in Samoa to Climate Change after Cyclone Evan

Photo courtesy of Dr. Mahendra Kumar

Lessons Learned and Policy Recommendations

- Hard infrastructure is necessary for resisting extreme events. It needs to be designed based on a detailed understanding of the surrounding coastal environment.
- Manual and toolkit for raising awareness and gender participation in their programs and projects effectively support climate change practitioners.
- Rapid damage assessments support recommendations to guide the government's recovery strategy. It leads to more comprehensive solution by using various approaches.

Outline

Background

Cyclone Evan hit Samoa in December 2012, destroying over 600 homes, killing 14 and displacing more than 7,500 people. The value of durable physical assets across all economic and social sectors destroyed by Evan was estimated at USD 103.3 million. In addition, production losses and higher production costs arising from the disaster across all sectors are estimated at USD 100.6 million. Thus, the total effects of the disaster amount to USD 203.9 million. Given the relatively small size of the Samoan economy, these figures are significant. The total estimated damage and loss are equivalent to about 28 percent of the total value of goods and services produced in the country in 2011. Furthermore, the estimated value of physical assets destroyed represents 109 percent of the normal value of construction activities in Samoa, from which it can be inferred that recovery and reconstruction will take around two to three years.[1]

The National Building Code has not been revised or updated since its promulgation in 1992. As a consequence, some infrastructure in Samoa might not always be constructed according to international best practices, which include climate-resilient designs. Furthermore, infrastructure to supply electricity, water and sanitation are vulnerable to climate-induced natural hazards. This is evidenced by disruption to these services in the aftermath of Cyclone Evan. Roads, bridges, and ports were also damaged by the cyclone.

Many agencies and institutions supported the post-disaster recovery in Samoa in many sectors (transportation, agriculture, fishery, coastal management, financial mechanism etc.), to increase the resilience of Samoa's vulnerable population. These comprehensive build back better processes are introduced in this case study.

Formal development of the Disaster Risk Reduction (DRR) management approach within governance structures at a national level had not been realized. While legislative support for DRR existed in the country, there was a need to strengthen implementation mechanisms for risk-reduction initiatives at all levels through the development of a comprehensive DRR implementation strategy.

Table 2-4-1 Target projects of this study

Project title	Implementing / Funding Agencies
Resilient Recovery in Samoa after Cyclone Evan (incl. Samoa Development Policy Operation) [2]	WB, GFDRR, ACP-EU NDRR
The Pacific Adaptation to Climate Change (PACC) Program [3]	UNDP, GEF, AusAID, SPREP

Objectives

The Resilient Recovery in Samoa after Cyclone Evan project aims to assess damages, launch a comprehensive disaster recovery and reconstruction plan to make the transport and agriculture sectors more resilient, and strengthen the country's financial capacity to manage future shocks from natural disasters, with cooperation from the government of Samoa and supporting agencies.

The Samoa PACC project aimed to develop a community-based integrated coastal protection model, in order to increase the resilience of the country's coastal communities and infrastructure to the impacts of climate change.

Institutional arrangements

The Disaster Advisory Committee (DAC), chaired by the CEO of the Ministry of Natural Resources and Environment (MNRE), is the apex body that coordinates policy formulation and regulatory roles for all disaster risk management functions, including CEOs from government ministries, private sector, NGOs and heads of international/regional organizations and overseas missions.

Samoa ensures good coordination among donors and development partners such as Australia, the European Union, China, Japan, New Zealand, the World Bank, the Asian Development Bank and the United Nations Development Program, which are the key agencies active in Samoa. Development assistance makes up around 15% of GDP. The multi-donor contributions are coordinated by the Aid Coordination Division, located in the Ministry of Finance (MOF). This has resulted in a number of multi-donor, multi-year sector-wide programs. This includes a three-year public sector investment program that has been formulated and integrated into the budgetary process. Development partners work through the Aid Coordination Division.

Resilient Recovery in Samoa after Cyclone Evan was supported by The World Bank (WB) and the Global Facility for Disaster Reduction and Recovery (GFDRR), with funding from the Africa Caribbean Pacific–European Union Natural Disaster Risk Reduction Program (ACP-EU NDRR).

Championed by the Government of Samoa, PACC project received direct support from UNDP as the implementing agency. Project execution was ensured by the Secretariat of the Pacific Regional Environment Programme (SPREP). PACC was funded by the Global Environment Facility (GEF)'s Special Climate Change Fund (SCCF) and Australian AID. **(See Figure 2-4-1)**

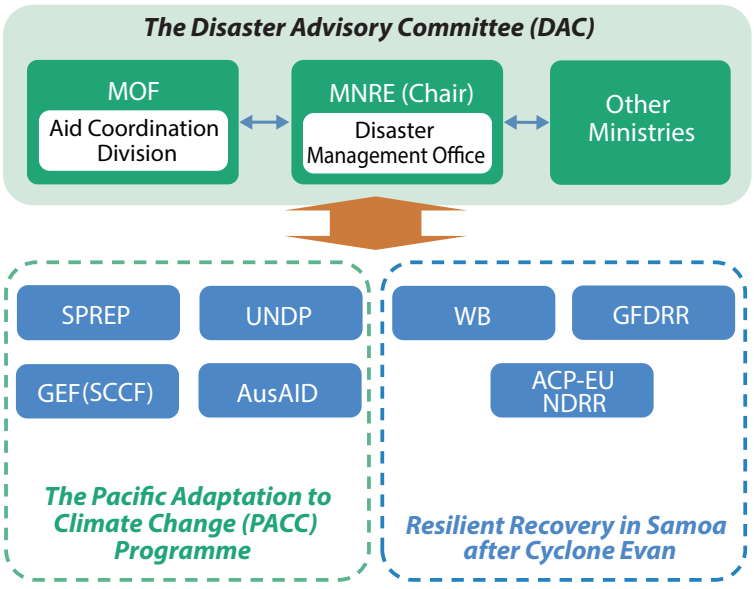

Figure 2-4-1 Institutional arrangements of target projects

Activities

Resilient Recovery in Samoa after Cyclone Evan

The World Bank and GFDRR, along with funding from the ACP-EU NDRR Program, supported the post-disaster recovery in Samoa by conducting an assessment of the socio-economic damage from the storm, with recommendations for recovery and reconstruction planning and fund mobilization.

The assessment helped mobilize three World Bank grants for:

- Repairing damaged roads and bridges and strengthening resilience of Samoa's road infrastructure through the Enhanced Road Access Project.
- Providing technical assistance and funding to repair damaged facilities, establishing regular disaster-related data collection systems and strengthening disaster response capacity through the Agriculture and Fisheries Cyclone Response Project.
- Strengthening public financial management and government budgetary response to future shocks through the Samoa Development Policy Operation Project.

The Pacific Adaptation to Climate Change (PACC) Program

The early stages of the project were disrupted by a deadly tsunami which struck the south of Upolu in late September 2009. As a result, attention became focused on the village of Tafitoala, which is located on the south coast, as a pilot site for the PACC project. Probably as a reaction to the tsunami, the community identified a seawall as a priority for the project, and this was built in 2010. The seawall was also supported by 'soft' adaptation measures such as planting salt-tolerant coastal plants to create natural barriers along the coastline, and planting along the streamside from ridge to coast.

The Samoa PACC project is working with the government to implement a community-based integrated coastal protection model, in order to increase the resilience of its coastal communities and infrastructure to the impacts of climate change.

Community and stakeholder meetings and national consultative processes were undertaken. As a result, the PACC project has achieved: 1) Combined manual and guideline for shoreline protection and river defenses with links to strengthening existing planning regulations and legislation, and 2) Established a bylaw with the community to aid in the rehabilitation of river and water catchment areas (which both enhances capacity and cultivates links to policy enforcement and implementation).

The project is working at three sites – Tafitoala village on Upolu and Lefagaoalii and Lalomalava on Savai'i. Activities include re-vegetation of coastal areas, building protection structures and community awareness consultations and engagement. A water resource bylaw, linked to their coastal protection program, has been formulated and endorsed for the village of Tafitoala.

2,593 acres of upland water catchment areas have been revegetated and rehabilitated; these actions are keys to reducing flood risks. For example, in the Safata district watershed with its emblematic waterfalls, PACC activities have been coordinated with MNRE's Water Resources Division, given that this large catchment has its narrow outlet right at Tafitoala village.[4]

Image of Re-vegetation

Photo courtesy of Dr. Mahendra Kumar

Lessons Learned and Policy Recommendations

1 Hard infrastructure is necessary for resisting extreme events. It needs to be designed based on a detailed understanding of the surrounding coastal environment.

Reducing the vulnerability of coasts already impacted by sea level rise, storms surges, high waves and high tides, damaging fragile and often densely populated coastal zones, is one of the focus areas of many adaptation programs in Samoa. Climate-proofing coastal infrastructure, through hard engineering structures such as sea walls are often the only viable option in the medium term but which have benefits on a longer term basis.

In December 2012, however, Cyclone Evan exposed some technical problems with the seawall. For example, flooding was exacerbated because the seawall did not have appropriate culverts to allow sufficient flows from the rain-swollen river into the ocean. A later review identified more non-sustainable features of the seawall, and concluded that the design had not been based on a full understanding of coastal science, coastal hazards and climate risks. In addition, the review showed that the project did not follow rigorous decision-making processes to fully assess coastal vulnerabilities and the implications of interventions. The planning process did not consider and evaluate all possible options.

A key lesson is the importance of careful and thorough planning at the early stages of adaptation projects, and the use of tools such as vulnerability and adaptation assessments, socio-economic assessments and cost–benefit analyses to identify and evaluate all options in order to select the most appropriate one. Hard infrastructures need to be designed based on a detailed understanding of the surrounding coastal and watershed environment and flood conveyance routes. This should include coastal and flood risk modeling, and climate and sea level projections.

2 Manual and toolkit for raising awareness and gender participation in their programs and projects effectively support climate change practitioners.

Raising awareness among decision makers, including communities, of climate change and its impacts, especially the range of measures available to reduce vulnerability is essential. When decision makers understand climate risk, and the options to reduce the risk, they will be able to make informed and better decisions. Disaster Management Office is developing toolkits to raise awareness and to provide a strategic framework for an integrated approach. In addition, the PACC team develops the "Living with Rivers and Seas" manual, to provide clear guidance on how to design, construct and monitor river and sea defense schemes in the future.[5]

Another toolkit was designed to support climate change practitioners in the Pacific islands region to integrate gender into their programs and projects. When all men and women are able to fully participate in development decisions and actions, everyone benefits. Integrating gender into climate change adaptation at all levels, from national policy to on-the ground initiatives, will strengthen the ability of the Pacific islands region to face the climate change challenge. Mainstreaming gender will take time and effort. It requires responsive institutional arrangements, political will and commitment, gender awareness and skills, and dedicated resources. This toolkit, The Pacific Gender and Climate Change Toolkit available via the Pacific Climate Change Portal, can help climate change practitioners in the Pacific region mainstream gender into their climate change initiatives.

3 Rapid damage assessments support recommendations to guide the government's recovery strategy. It leads to more comprehensive solution by using various approaches.

An initial assessment was completed five weeks after the Cyclone Evan. The timely assessment results informed government decisions about their national recovery strategy. These decisions were endorsed by the cabinet and are currently under implementation.

Inclusion of 'building back better' principles and risk reduction into recovery and reconstruction is important in efforts to build disaster and climate resilience. The damage assessment addressed how to quickly respond to the immediate needs of the population and also strengthen the island against future storms; for example by enforcing improved building regulations.

Cyclone Evan caused some setbacks to the PACC project, and provided some valuable lessons. As a result, the project is looking at the whole community such as through 'ridge to reef' and ecosystem-based approaches, expanding activities to include watershed management and rehabilitation, and is also revisiting the community bylaw to ensure it addresses river protection challenges such as encroachments on river flood plains, activities up-river and coastal resource management issues.

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