## SAMOA CASE STUDY
### INTEGRATING CLIMATE CHANGE RISKS INTO THE AGRICULTURE AND HEALTH SECTORS IN SAMOA

<table>
<thead>
<tr>
<th><strong>Country</strong></th>
<th>Samoa [<a href="http://www.adaptationlearning.net/country-profiles/ws">http://www.adaptationlearning.net/country-profiles/ws</a>]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Region</strong></td>
<td>Polynesia</td>
</tr>
<tr>
<td><strong>Key Result Area</strong></td>
<td>Adaptation</td>
</tr>
<tr>
<td><strong>Thematic Sector</strong></td>
<td>Agriculture / Food Security, Public Health</td>
</tr>
<tr>
<td><strong>Keywords:</strong></td>
<td><em>Rural livelihoods, coastal communities, disaster risk management, agricultural production</em></td>
</tr>
</tbody>
</table>
| **Project Activity Dates** | Start:2009  
                            End:2012                                      |
| **Implementing Agencies** | Government of Samoa: Ministry of Natural Resources, Environment, and Meteorology; Ministry of Agriculture and Fisheries; Ministry of Health and the National Health Services |
**ABSTRACT**

Increasing evidence of climate change-induced risks confronts the Samoan community with serious livelihood challenges, especially in the agriculture and health sectors. The increasing frequency and length of extreme climatic events have adversely impacted on agricultural production, which has led to loss of crops and soil erosion. Along with agricultural vulnerability, there are growing concerns about climate related vector-borne, food-borne and water-borne diseases. This project, Integrating Climate Change Risks in the Agriculture and Health Sectors (ICCRA&HS), has set specific goals to reduce climate change-induced risks in the Samoan community in these key development sectors.

Supported by the United Nations Development Programme (UNDP), the project is working to safeguard human development in Samoa from the risks associated with climate change. Efforts are also being made to enhance national, sub-national, and local capacities of government authorities, public health workers and planners to understand climate risk dynamics. In short, the project is focusing on the resilience and adaptive capacity of Samoan coastal communities to climate change impacts on agricultural production and public health. Project outcomes include enhancing the technical capabilities of the Samoa Meteorological Division, improving Samoa’s capacity to perform short-term and long-term agricultural planning, and strengthening Samoa’s capacity in public health. To ensure that lessons and knowledge gained from this project can be shared and successes replicated, information will be disseminated through UNDP’s Adaptation Learning Mechanism.

**BRIEF DESCRIPTION OF ISSUES**

**Background**

Samoan is a small island state located in the South Pacific Ocean. Samoa consists of four main inhabited islands and six smaller uninhabited islands. Approximately 70 percent of Samoa’s population and infrastructure are located in low-lying coastal areas. Samoans are highly dependent on natural resources for their livelihoods, as fishing and tourism are important sources of income, particularly for coastal populations. Climate change is projected to have significant impacts on agricultural production, food security and the public health sector in Samoa. The adverse effects of climate change include: an increase in the frequency and length of extreme daily rainfall events and droughts; an increase in maximum air temperatures; sea level rise of 5.2 mm/year, and maximum hourly sea level increases at a rate of 8.2 mm/yr. People living in the coastal zone are particularly vulnerable to these extreme climatic events.

**Problem**

The agricultural sector is threatened by extreme climatic events. Heavy rainfall, tropical cyclones and droughts bring major damage to rice fields and crops, and subsequent soil erosion. One of the most significant effects of these extreme climatic events is disruptions to the availability of food. This loss of soil undermines the viability of plantations and other forms of subsistence agriculture; agricultural runoff sedimentation in coastal waters can also threaten fish stocks. These climate change-induced effects have significant impact on the market price for food in Samoa. In addition, various health problems such as vector-borne, food-borne and water-borne diseases are involved with the systematic changes in climate. The increased prevalence of diseases is a result of rising air and water temperatures, increased frequency and duration of rainfall events, and other climate-related factors. For instance, flooding can lead to increases in mosquito populations that transmit diseases, including filariasis, dengue fever, typhoid, and diarrhoea as well as a number of gastrointestinal infections. Flooding also can result in an overflow of sewerage systems which can lead to spreading pathogens and other water-borne diseases.

**BRIEF DESCRIPTION OF PROJECT**

**Major Goals: Potential Indicators for Monitoring Adaptation**

The main goal of the Integrating Climate Change Risks into the Agriculture and Health Sectors in Samoa project is to safeguard human development in Samoa from new and additional risks associated with climate change. Along with the main goal, the overall objective of the project is to enhance the resilience and adaptive capacity of Samoan coastal communities to the adverse impacts of climate change.
on agricultural production and public health. Firstly, the project aims to enhance technical and organisational capabilities of the Samoa Meteorological Division. These capabilities will help Samoa monitor climate change risks, and provide early warning communications to the agricultural and health sectors. The second aim is to improve Samoa’s Capacity to perform short-term (seasonal) and long-term (decadal) agricultural planning, and crop management. A long-term strategy for agricultural diversification and integration of climate resilience will be incorporated into Samoa’s National Agricultural Sector Plan. There will also be targeted capacity building in agricultural planning. The third purpose of the project is to strengthen Samoa’s capacity in public health. Public health planner and worker capacities will be strengthened to reduce the impact of climate change on this sector. In addition, this project aims to support the Government of Samoa with LDCF funding to enhance learning and evaluation regarding long-term climate change-induced risk reduction as well as to implement adaptive management for vulnerable local communities in the agriculture and health sectors. Project lessons will be added to the Adaptation Learning Mechanism on a continual basis. Information will also be shared with other climate-sensitive sectors in Samoa.

- Develop a national strategy and monitoring system to facilitate health sector adaptation;
- Build adaptive capacity for agriculture and food security at the national and village levels;
- Provide early warning systems for minimising the exposure of communities to extreme climatic events.

The project will integrate climate change concerns into relevant national development plans and policies and also be aligned with core UNDP activities in Samoa. The project focuses on the enhancement of organisational and technical capabilities in the Samoa Meteorology Division to monitor climate trends and provide regular, timely and accurate climate risk and early warning information to agricultural extension and public health services. The project will strengthen the capabilities of Samoan public health workers and agricultural planners to make use of climate risk information and adopt measures that increase the resilience of communities to climate-induced food security and disease risks. Demonstration of adaptive crop management and climate-related disease prevention in four high-risk districts will provide a knowledge base to catalyse increasingly resilient policy and investment decisions in Samoa, and enable replication and up-scaling of project lessons within the country and in the wider Pacific region.

**Solution: Adaptation Approach, Components and Description**

The Integrating Climate Change Risks in the Agriculture and Health Sectors (ICCRA&HS) project will help the Government of Samoa develop an integrated approach to address climate change impacts through adaptive actions. The project’s main components aim to both further understand the effects of climate change in the agriculture and health sectors in Samoa, and to inform future adaptation planning and actions. These goals will be accomplished by:

- Collecting and exchanging climate data between sector professionals and regional climate observation networks;
- Obtaining an estimate of the damage to Samoan population and economy of climate change related risks in the agriculture and health sectors. This will help quantify the benefits of adaptation measures;
- Identifying and evaluating alternative adaptation measures applicable to Samoa;
- Revising agricultural management plans and strategies, national soil and crop maps, and public health plans;
- Providing the Samoan authorities and institutions with an effective tool to estimate the future potential damage to crops and farms and to plan future adaptation investments based on different risk scenarios;
- Craft an early warning system to prevent significant damage to the agriculture and health sectors.

By providing information on lessons learned and insights gained on adaptation to climate change from global, country, and sector-level analyses, the hope is to help policymakers worldwide prioritise actions, along with developing a robust, integrated approach for greater resilience to climate risks.

**PROJECT CHALLENGES AND SOLUTIONS**

**Major Challenges**

Although many international organisations, government bodies and NGOs are working to improve resilience to climate risk in Samoa, there are a number of barriers to climate change adaptation. On a fundamental level it is difficult to translate the adaptation to climate change concept and priority into departmental planning due to a number of reasons; inadequate water resource information; lack of funding and institutional support; lack of access to agricultural techniques; lack of climate change information. Furthermore, limited awareness of climate change risks amongst the local community could impede national adaptation strategies and capacity building.
### Successful Practices

**Key Successes**
The goal of enhancing technical and organisational capabilities of the Samoa Meteorological Division has been successful, with several objectives being implemented towards the development of a Climate Early Warning System (CLEWS). The purpose of CLEWS is to provide effective early warning information to the agriculture and public health sectors, focusing on key risk relationships between weather, climate, agriculture and health. The Samoa Meteorological Division aims for CLEWS to be fully operational by the end of 2012.

**What Factors Supported Success**
- Extension of climate observing network to enable improved weather risk forecasting - storms, heavy rainfall etc.
- New open-source climate database management system to improve recovery, quality assurance, analysis and use of data in near real time for climate advisories and bulletin
- Increased sector (agriculture and health) engagement and interaction to design and implement targeted information, bulletins and key risk updates
- Increased community engagement, including use of traditional knowledge, to improve hazard response planning, responsibilities and lines of communication

**Relevant Information**
*Climate and Weather Services to Agriculture through the Climate Early Warning System* - booklet over-viewing the technical components of the CLEWS. This has been written for planning and management purposes, and to assist with input to sector engagement.

<table>
<thead>
<tr>
<th>Key Successes</th>
<th>Increased understanding of how to improve climate resilience in public health and improved interaction between Samoa Met Division and public health workers</th>
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<tbody>
<tr>
<td><strong>What Factors Supported Success</strong></td>
<td>One factor that supported an increased resilience in public health outcomes was the establishment of a Climate-Health cooperation program.</td>
</tr>
</tbody>
</table>
| **Relevant Information** | - Education, monitoring, and control of pest plants and animal species that would otherwise adversely impact upon health and biodiversity  
- Collection of better health, meteorological, environmental, and socioeconomic data for health planning, including development of a health vulnerability indicator  
- Development of early intervention health services to deal with water and vector-borne diseases; upgraded health clinics and additional funding for district nurses |

<table>
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<tr>
<th>Key Successes</th>
<th>Enhanced potential for climate resilient agricultural production and food security.</th>
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<tbody>
<tr>
<td><strong>What Factors Supported Success</strong></td>
<td>Investments in annual crops and home vegetable farming, as well as the development of alternative farming systems, have supported the success of increasing agricultural production and food security.</td>
</tr>
</tbody>
</table>
| **Relevant Information** | - Identify and establish village/home-based vegetable farming areas  
- Strategy and farming adviser  
- Increase efficiency of existing plantation areas  
- Inspection management and advisory program  
- Identify and implement sustainable management of fish and shellfish resources |

### LESSONS LEARNED

**Progress to date**
In early 2008, Cabinet approved the National Climate Change Policy which provides a national framework to mitigate the effects of climate change and adapt to its impacts in an effective and sustainable manner. Additional progress made by the Government of Samoa is the Climate Early Warning System (CLEWS). It contributes to increased management effectiveness from a given extreme climate situation, and will be replicated across the Pacific. This will help the Samoan community and Government officials to improve reaction times and responses to emergencies. As a result of this project, Samoa’s health sector has revitalised its training, research and delivery programmes, as well as begun to mainstream its public health policies responding to climate related diseases. The Government of Samoa is planning to complete a national climate related diseases baseline database, which can allow epidemiologists to better understand and monitor the impacts of climate change on vector-borne, food-borne and water-borne diseases by 2012.
**Key lessons learned**
Integrating climate change risks into the agriculture sector begins with understanding key relationships between climate variability and change and impacts on agricultural systems and production. Some of this understanding is intuitive to farmers who often make adjustments to their practices in response to changing weather and climate, for instance by introducing new varieties and more resistant crops. Other collaborative adjustments include rezoning agriculture and training farmers on sustainable land management. An objective of CLEWS is to combine the skills of meteorologists, farmers and agricultural administrators to provide greater lead time in planning for mitigation of weather and climate risks to agriculture. The aim is that this will happen on various time scales, from a few days, to seasonal and multi-decadal time scales.

**Sustainability**
Since the majority of all households in Samoa depend on agricultural and fishing activities for their livelihood, it is important to provide technical services to ensure that food security is maintained and enhanced. Climate change adaptation programmes in Samoa must be developed and maintained to ensure the long-term sustainability and viability of the agriculture and health sectors. Success in climate change adaptation depends on commitments by the UNDP and other related bodies, and provision of appropriate policy by the Government of Samoa. GEF-LDCF funding must be disbursed to sustain on-going adaptive programmes in a timely manner to build or obtain appropriate equipment and train local authorities and communities.

**Funding**
Funding Sources: GEF-LDCF
GEF Project Grant: US$2,050,000
Co-financing: US$2,100,000
Total project cost: US$4,150,000

**Time Frame**
2009-2012
Profile Created: October 2011

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**References used:** UNDP Project Factsheet, the Government of Samoa National Adaptation Programme of Action (2005), The World Bank EACC Samoa report, GEF Project Docs, Oceania University of Medicine “Climate Health- A Wealth Opportunity for Samoa” and comments by Alan Porteous, National Climate Centre (NIWA).

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**For more Information:**
UNDP Samoa – Project Details
UNDP’s Adaptation Learning Mechanism: http://www.adaptationlearning.net
UNDP-ALM’s Project Profile for ICCRA&HS: http://www.adaptationlearning.net/project/lDCF_SAMOA