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THE **COASTAL COMMUNITY ADAPTATION PROJECT**

C-CAP NEWSLETTER

Helping Pacific Island Communities Adapt to a Changing Climate

OCTOBER 2013

IN THIS ISSUE

ADAPTATION ACTION IS A MUST FOR KIRIBATI

For C-CAP's Nicholas Hobgood and Jeremy Cole, *their first visit to Kiribati was an eye-opening experience, revealing the urgency and importance of suitable adaptation measures for vulnerable Pacific Island States.*

This month, C-CAP branched into an additional country—Kiribati (pronounced kir-i-bas). There, Deputy Chief of Party (DCOP) Nicholas Hobgood and Senior Technical Advisor Jeremy Cole met with project partners, stakeholders and experts to introduce the project.[1]

1 Including representatives from the Office of the President; Environmental Control Division of the Ministry of Environment, Lands and Agricultural Development; Red Cross Foundation of the Peoples of the South Pacific Kiribati; and Taiwanese technical mission.

"The threat of high tide events is very clear. Much of Tarawa is at critically low elevation levels and high tide events are causing major erosion issues, threatening people's homes."

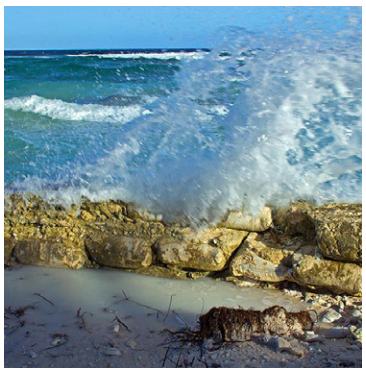
– Nick Hobgood, C-CAP DCOP

While investigating potential sites for participation, the team learned much about the challenges that I-Kiribati communities are facing from climate change effects.

ABOVE: Coastal scene in Kiribati showing placement of stone walls and other materials to reclaim land and prevent future coastline erosion. *Photo by C-CAP.*

ADAPTATION ACTION IS A MUST FOR KIRIBATI continued...

The physical characteristics of Kiribati make the country exceptionally vulnerable to the effects of climate change and sea level rise. The highest point in Kiribati's capital of South Tarawa—the narrow southern section of the Tarawa atoll and home to over 50,000 people—is a mere three meters above sea level. Continued sea level rise presents a significant threat to the habitability of the country's islands.



ABOVE (clockwise from top): House surrounded by standing water; seawall on a Kiribati beach is hit by waves; groynes constructed from stone and rubble protect the beaches from erosion. *Photos by C-CAP.*

For Kiribati the immediate imperative is to both ensure that resident communities have the 'adaptive capacity' necessary to face existing and predicted short-term impacts, and that islands with higher average elevation and greater natural resource concentration are adequately protected. On top of the threats of storm surge, high tides, and sea level rise, South Tarawa is experiencing a large influx of people from outer islands for its more reliable water supply and power, placing increased pressure on the natural environment.

Because building materials are very scarce, new immigrants utilize whatever natural resources are available. The team observed a front-loader deployed in the lagoon at low tide that was excavating sand to use for fill elsewhere on the island. Responses to increasing population pressures like this pose the potential for Tarawa to experience serious negative environmental impacts, placing additional stress on natural systems already threatened by climate change. These are the kinds of challenges that C-CAP seeks to address under the land use planning-focused component of the Project.

The Kiribati Government is taking action at the policy level to stem the impacts of population relocation arising from climate change impacts. C-CAP learned that the Government is currently buying copra at subsidized prices to create an economic incentive for people to continue working and living on outlying islands. Through another program, the Government pays transportation costs for shipping rainwater harvesting equipment to outer islands.

In the near term, the degree to which I-Kiribati communities will be negatively impacted by climate change effects will largely depend on the adoption of climate change adaptation solutions and policies. In the longer term, continued sea level rise poses an ongoing threat to both outlying and mainland-Tarawa communities.

The USAID/C-CAP team is excited to begin assisting I-Kiribati communities to identify, shape, and build adaptation strategies and solutions that will contribute to a more resilient future for this vulnerable Pacific Island nation.

C-CAP BRANCHES OUT

NEW COMMUNITIES SELECTED FOR VANUATU

In recent months, C-CAP has extended its reach to Vanuatu, where the team has commenced engagement with five vulnerable small-island communities in need of climate change adaptation assistance.

C-CAP began Vanuatu site selection in early 2013, identifying Pele Island, and Tassariki village on Moso Island, as the project'sinitial sites. This month, working with the National Advisory Board (NAB) and the Shefa Province authorities, C-CAP brought the communities of Wiana (Emao Island), and Nekapa and Unakap (Nguna Island) on board the Project.

Pele, Moso, Emao and Nguna islands are each accessible from the country's main island of Efate by boat—each of the sites were found to be vulnerable to climate change and natural disaster risk.

C-CAP identifies and selects participating communities in close coordination with national authorities and stakeholders, and based on an investigation that entails a review of climate change vulnerability studies where available, site visits, and consultations with experts, and communities. In Vanuatu, the NAB was instrumental in helping the C-CAP team to identify the most suitable communities to participate in the Project, and endorsed C-CAP's engagement with the chosen communities. Also instrumental was advice from climate change donors and program implementers indicating that the selected communities have shown commitment to engage in future climate change and disaster risk reduction interventions that would support community-level adaption, making them ideal candidates to receive USAID/C-CAP assistance.

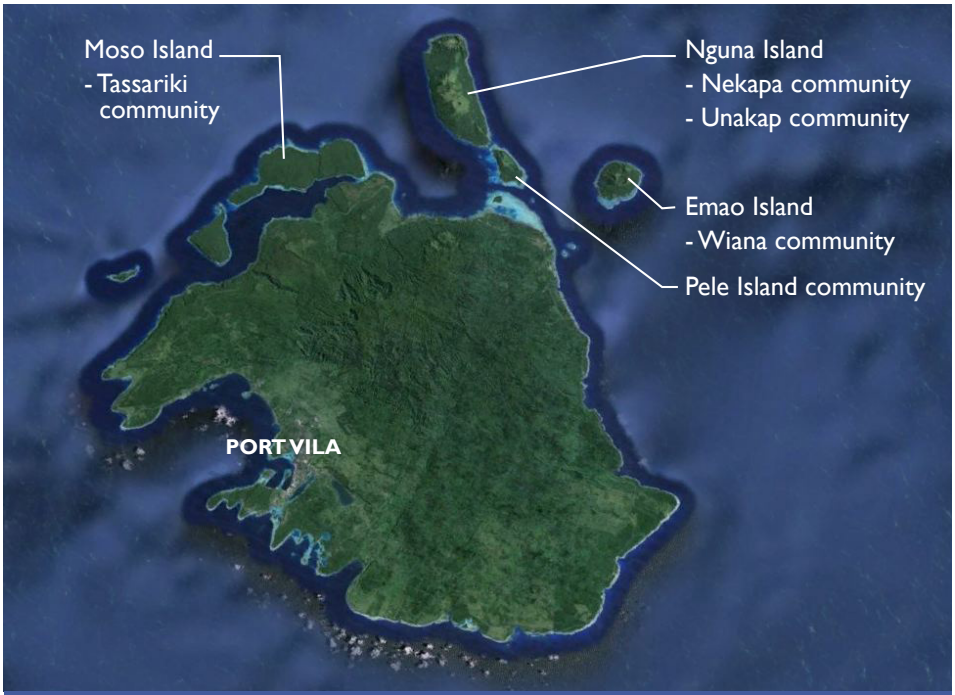


Image: © Copyright Google Earth

C-CAP uses site selection criteria to assist the decision-making process. Factors considered include population size, proximity to the ocean or waterways, health of existing natural resources, severity of climate-related impacts, and existing local governance structures.

Some important factors influencing the decision to work with the newly-selected Vanuatu communities include:

- The island of Emao is experiencing severe coastal erosion in several sites.
- Emao Island sites have had little to no engagement with partners or donors and are lacking in technical adaptive capacity.
- The island of Nguna is experiencing declines in agricultural productivity and supplies of marine resources from their reefs.
- Nguna Island sites lack specific climate adaptive capacity but have relatively high natural resource management capacity (due to existing work by the Nguna-Pele Marine and Land Protected Area Network, the European Union Global Climate Change Alliance project and the Secretariat of the Pacific Community-GIZ Program).
- The relative proximity of the sites to one another and the capital was considered a positive factor. It enables efficient procurement and construction activities, where reduced costs can be applied to the projects for better outcomes for each of the vulnerable communities.

C-CAP BRANCHES OUT continued...

Each site has demonstrable links to National, Provincial and Sectoral development policies, strategies and initiatives—resources which the C-CAP team will consult to ensure project interventions are sympathetic to locally-developed plans.

The C-CAP team plans to complement assessments and projects undertaken or underway in the vicinity of these communities (e.g. by GIZ, New Zealand MFAT, and USAID's ADAPT program). Key questions being asked include: "what impact is climate change having on these communities?", "what climate change risk mitigation measures have been already adopted?" and "what adaptation measures need to be adopted to address future risks?"

Vulnerability and adaptation (V&A) assessments have been conducted for Pele, Tassariki, Nekapa and Unakap communities. Having performed these V&A assessments—which capture socio-economic, resource, and health information about each community—the C-CAP team has a good understanding of site-specific challenges and opportunities, which will inform the team's forthcoming work to help communities identify climate change adaptation needs and priorities that are appropriate for the local context.

In December 2013, C-CAP will assist the communities to identify their top infrastructure needs for climate change adaptation using C-CAP's Infrastructure Prioritization Index participatory tool, positioning the project to commence chosen construction/rehabilitation activities in early 2014.

PROGRESS SNAPSHOT: VANUATU, FIJI, TONGA & SAMOA

The C-CAP team has been kept very busy in the last few months, taking the Project to new places. Not only did the team kick-start engagement with two new participating countries (Solomon Islands and Kiribati—see *Adaptation Action is a Must for Kiribati* article above), they also secured the participation of several new communities, extending C-CAP's presence in Fiji, Tonga, Samoa, and Vanuatu. Work is also underway to select additional participating communities in PNG.

Vanuatu The C-CAP team, in consultation with the Vanuatu National Advisory Board, recently selected new communities for Vanuatu. Vulnerability and adaptation assessments have already been conducted for the two Nguna Island sites.
New chosen communities: Wiana (Emao Island), and Nekapa and Unakap (Nguna Island).
Initial chosen communities: Pele Island and Tassariki.
Total number of selected communities: 5
See *C-CAP Branches Out* article above.

Fiji The C-CAP team has worked with iTaukei Affairs to identify and select five additional communities to receive C-CAP support in Fiji. The team recently visited three of the new communities to collect baseline information.
New chosen communities: Vusasivo, Korotasere, Yaqaga, Nasegai, and the adjacent villages of Nakoronawa/Nakaugasele/Loanikoro.
Initial chosen communities: Buretu, Daku, Vunisinu/Nalase, Karoko, and Vunisavisavi.
Total number of selected communities: 10

Tonga
The C-CAP team recently coordinated with government officials and stakeholders in Tonga to identify three additional project sites. Another two communities will be selected in the coming months.
New chosen communities: 'Utulei, Tefisi, Hunga.
Initial chosen communities: Popua, Sopu, Tatakamotonga, Nukuleka, Ahau. Total number of selected communities: 8

Samoa The C-CAP team recently coordinated with Samoa's National Project Advisory Committee and Samoa Red Cross to identify five additional communities to participate in C-CAP in 2014.
New chosen communities: Afega, Taelefaga, Laulii, Taga, and Sala'ilua. Initial chosen communities: Falealupo, Auala, Asau, Manase, and Sapapalii.
Total number of selected communities: 10

ADDRESSING RAINFALL RISKS: STORMWATER MANAGEMENT FOR CLIMATE CHANGE RESILIENCE

Stormwater management is a term more commonly associated with urban environments, than with small, coastal communities, whose landcover is predominately made up of sand, green space, and gardens. But the C-CAP team is discovering that stormwater management is an important issue in many of the project's participating communities. As communities consider ways to adapt to predicted climate change impacts, addressing inadequate stormwater management systems is amongst the most common priorities.

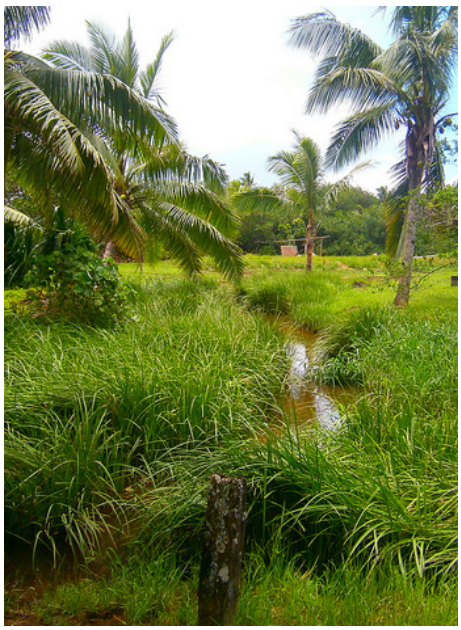
An effective stormwater system is one that is able to successfully capture, convey, and discharge the volume of rainwater that falls in a catchment area during a rainfall event, both safely and without causing damage. In practice, a stormwater system comprises a collection of built or engineered components for retaining, conveying, or otherwise managing rainwater.

Within urban settings, these components commonly include rainwater tanks, retention basins, gutters, pipes, grassed swales, engineered creeks, constructed wetlands, and subsoil drains. Other associated components include culverts, riprap, and grates/trash racks/first-flush devices. Stormwater systems installed to cope with rainfall volumes experienced last century are likely to need review in areas that are expected to receive more intense and/or frequent rainfall.

Scientists predict that Pacific Island countries will likely experience an increase in the intensity of rainfall over this century. This means that when it rains, there is likely to be a greater volume of rainfall than previously experienced. Some countries will be particularly vulnerable to flooding—there is high confidence from scientists that days of extreme rainfall in Fiji and Kiribati will become more intense and frequent; Kiribati is also projected to experience an increase in mean annual rainfall.[1]

In small coastal communities, stormwater systems are simple and small-scale, often comprising gutters and rainwater tanks, with some overland flow swales, piping, and culverts. These elements—though often disparately arranged—applied cumulatively affect how stormwater moves through, and impacts, the community. When stormwater systems cannot cope with the volume of rainfall experienced, flash flooding, soil erosion, and/or standing water results.

[1] Refer to Pacific Climate Change Science Program country reports for Fiji and Kiribati www.pacificclimatechangescience.org/publications/reports/



ABOVE: Images from the neighboring Fijian villages of Vunisinu and Nalase, showing poor drainage (left, bottom right) and a community elder describing the frequently-occuring flooding (top right). *Photos by C-CAP.*

ADDRESSING RAINFALL RISKS continued...

In a coastal community setting, some built-environment options for improving existing storm-water management systems include:

Grassed swales/overland flow channels small linear gullies that are graded to direct stormwater away from buildings, crops, or other infrastructure.

Perforated subsoil drain pipes used under the ground in depressed areas such as gullies where soil is not free-draining to convey water to a suitable discharge point.

Soil stabilization solutions Boulders, concrete rubble, or other material to interrupt the flow of water which can scour banks and gullies. Vegetation can also be used for interrupting water flow and binding soil.

Constructed wetlands low-lying areas designed to receive storm-water, and planted with native vegetation suited to inundation. Healthy wetlands naturally harbor mosquito-eating fish, insects, amphibians and birds. Simple curved edges and a large surface area of open water further prevent mosquito breeding.

Flooding and standing water are issues that have the potential to severely affect the health and livelihoods of small Pacific Island coastal communities.

Flooding and standing water are issues that have the potential to severely affect the health and livelihoods of small Pacific Island coastal communities—especially the many that rely on subsistence agriculture, are low-lying, and with decentralized sewerage and drinking water systems. Flooding events can commonly cause septic tanks to overflow, contaminating the stormwater, and infiltrating fresh water reserves leaving communities vulnerable to bacterial disease outbreaks of diarrhea, and at worst, cholera and typhoid. Standing water can become a breeding-ground for mosquitoes, increasing the risk of malaria, dengue, and chikungunya outbreaks; while waterlogged soil can damage or kill crops.

In addition to more intense rainfall events, more intense storms are also predicted for the Pacific Island region. Low-lying coastal communities that do not have effective stormwater management systems are particularly vulnerable during storm events, as the combined effect of flooding from rainfall and salt water intrusion or overwash can threaten crops and freshwater reserves.

In many coastal communities in the Pacific Island region, traditional practices have historically served as adaptive measures to overcome extreme rainfall events (e.g. building houses on stilts or using dredged sand to raise the ground elevation). By continuing to adopt adaptive strategies that are aligned with traditional practices and knowledge, coastal communities are more likely to overcome the risks presented by extreme rainfall events, and thereby safeguard their health and livelihoods within the context of a changing climate.

For low-lying areas, long term planning concerning the placement of new buildings, roads, and other infrastructure is essential. In some instances, it may be helpful for adjacent communities to work together to manage related storm-water issues. Flood-prone areas may be designated as stormwater retention zones, and kept free from crops or buildings. Larger-scale engineered solutions may be required, such as levy banks and floodgates. Floodgates used in concert with levy banks may be an important solution

ABOVE: Stormwater drains exist to the ocean in the Samoan community of Manase where flooding regularly cuts off access to the village (left), and in the Fijian community of Koroko (right). *Photos by C-CAP.*

ADDRESSING RAINFALL RISKS continued...

for lowlying areas that are susceptible to the combined effective of flooding from high tides/storm surge and flooding from downpours, as they prevent saltwater intrusion while facilitating the controlled release of stormwater.

C-CAP is assisting several communities to combat stormwater issues set to worsen in the future due to climate change impacts. Participating communities that are situated in the Rewa Delta region of Fiji are particularly vulnerable to flooding due to their proximity to tributaries and their low-lying elevation. During discussions with C-CAP, the Rewa Delta villages of Buretu, Daku and Vunisinu/Nalase identified stormwater-related infrastructure projects as priority interventions for C-CAP.

C-CAP engineers are slated to design engineered solutions for participating Fijian communities in December. Chosen interventions—which include flood gates, soil stabilization, and improved drainage—will help these communities both to overcome immediate problems with flooding, standing water and soil erosion, and to mitigate these risks for the future.

These infrastructure-focused interventions are being accomplished under C-CAP's first program component, which is focused on the rehabilitation or construction of small-scale community infrastructure. C-CAP's second and third program components, which respectively focus on disaster prevention and preparedness, and climate-resilient land use planning, will further prepare Pacific Island communities to face the serious increased risks presented by climate change.