

**Government of the Republic of Palau and Secretariat of the Pacific Community**  
**Global Climate Change Alliance: Pacific Small Island States Project**  
**Project Concept Note**  
**Addressing water sector climate change vulnerabilities in the outlying states of Palau**

**Name of Country:** Republic of Palau

**Name of Person/Agency submitting this concept note:**

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**General Information:**

**Project title:** Addressing water sector climate change vulnerabilities in the outlying states of Palau.

**Project site(s):** Outlying island states, in particular Angaur state.

**Project Partners:**

- Palau Water Workers Association (Rural Water Operators Association)
- Office of Environmental Response and Coordination
- Ministry of Natural Resources, Environment & Tourism
- Environmental Quality Protection Board
  - Integrated Water Resource Management Program
- Palau Conservation Society
- National Development Bank of Palau
- Governors' Association
- Outlying States Communities Angaur

**Total Project Cost:** €500,000.

**Project Duration:** 2 years, completion December 2014.

**Project Description**

The project will examine water sector climate change vulnerabilities in the outlying island states in the Republic of Palau, and focus on identifying and addressing particular climate change vulnerabilities in the water sector in Angaur State. (Annex 1 provides some background information about Angaur State). The project will likely include the following: assessment of water sources and climate-related risks; reduction of leakages; upgrading and installation of appropriate water harvesting, storage facilities and additional water sources; training of operators and other stakeholders; examination of options to incentivise sustained best water management practices in the face of climate change; and a public awareness and education campaign for the residents to enable community empowerment and ownership of water resources.

Activities to be considered for inclusion in the detailed project design include:

- 1) Strengthening the capacity of the newly established Water and Sewer Corporation to identify and address climate change vulnerability in the water sector.
- 2) Assessing water sources and key climate related risks with local counterparts.
- 3) Collecting hydrological data to support policy and actions.
- 4) Auditing community water usage.
- 5) Enhancing water storage facilities.
- 6) Conducting a water efficiency pilot.
- 7) Certification training for water operators.
- 8) Conducting public awareness campaigns for groundwater protection, water, conservation and prevention of waterborne diseases.

## **Background and Justification**

Sea-level rise, shifting rainfall patterns and warmer temperatures are impacting the water lenses of the outlying island states, in particular Angaur, by decreasing the quantity and quality of available water. In Angaur, for example, the approximately 200 residents are presently dependent on a groundwater supply that is already insufficient in volume and poor in quality. (Further background details are presented in Annex 1). The poor quality water affects health, tourism, and agricultural productivity.

The project will provide for an assessment of water sources and key climate risks with local counterparts and identify options to increase and protect the quantity and quality of water sources. Enhancement of water harvesting, storage and efficiency will increase potable water availability. This will involve the application of appropriate technologies and identification of possible incentive modalities such as the Development Bank loan programmes. Enhancing Palau's Hydrological Program will support the states in their development of a policy for long term water protection and conservation. The community and household audit and survey together with the awareness campaigns will increase household-level resiliency. Finally, the certification training for water operators will contribute to sustainability of good practice in daily operations that impact each state's water supply.

### **Project Cost and Budget:**

The cost of the project will be approximately EUR500,000 and the budget for various activities will be detailed when the project is fully developed.

### **General Criteria for Identification of Projects**

<b>Criteria</b>	<b>How does the proposed project adhere to the criterion?</b>
1. <i>Feasibility</i> : Is the proposed project feasible taking into account: Time frame of GCCA:PSIS, Available budget, National human resources, Previous track record with project implementation.	The project can be undertaken within the timeframe of GCCA: PSIS. The budget covers all basic costs and takes into account in-kind national human resources, capacity building, infrastructure and equipment requirements. The Republic of Palau has several examples of successful project implementation.
2. <i>Cost</i> : Does the project require minimal resources	The project improves and enhances current activities. For example: components such as buildings to house water wells and pumps in Angaur are being supported by Angaur State Government with complementary funding and in-kind supplies provided by the Taiwanese private sector, Slovenia and AusAID. The resources required for the project are minimal compared to the total outputs and impact of the project.
3. <i>Consistency</i> : Does the project support the country's climate change adaptation policy and planning	The project supports the conservation and protection of natural resources and promotion of the health of the people. The recent Palau Water Policy states that clean and safe water is essential for the health of the people of Palau. The project is consistent with Angaur's State Government pursuit to improve its water system
4. <i>Urgency</i> : Is the project urgent or could it be delayed 10 years with minimal impact	Project delay will increase climate change vulnerabilities, degradation of natural resources, and impact on the health of the people. Outlying states including Angaur have been urgently seeking assistance with addressing water issues affected by climate and this project provides a timely opportunity for developing an effective comprehensive and replicable approach rather than piecemeal water sector

	development that does not incorporate climate change.
5. <i>Scientifically valid</i> : Is the project based on scientifically valid climate change projections	Sea level is projected to continue to rise during the 21 <sup>st</sup> century thereby enhancing conditions favourable for saltwater intrusion into the freshwater lens. Rainfall is projected to increase over the 21 <sup>st</sup> century however, there is significant variability from year to year which is expected to continue as a result of the El Niño Southern Oscillation <sup>1</sup> .
6. <i>Equity</i> : Does the project involve all sectors of society (especially community participation and gender considerations)	This project involves full participation of communities, national and local government and non-government organizations and provides opportunities for entry of gender and youth considerations in the design and implementation of the project.
7. <i>Replication</i> : Can the project be replicated in the country or elsewhere	This project is focused on the outlying island states of Palau in particular Angaur and can easily be replicated in Palau's other 15 states and in other Pacific Island Countries.
8. <i>Measurability</i> : Can the benefits of the project be measured and quantified	Monitoring and evaluation frameworks designed for Palau's Water, Health, Disaster Risk Management policies will be adapted for this project to measure the benefits. However, it is recognized that monitoring will have to extend beyond the project lifecycle to fully evaluate benefits.
9. <i>Scope of project</i> : Does the project activity focus on one sector and include a blend of visible (on-the-ground) activities and intangible support activities (e.g. policy development, capacity building)	The Project focuses on water, including improvement of data collection, provision of equipment, harvesting and storage facilities in at least one outlying state and includes strong linkages to tangible health, hygiene and livelihood outputs. In addition, the activity includes assessments, policy development at multiple levels, public-private partnerships and local capacity building and community empowerment.
10. <i>Risks</i> : Identify key risks to successful project implementation	Some equipment may have to be procured from off-island vendors which may cause a delay in some of the activities. Weather can also cause delays as the outlying island states are accessible by boat only.
Date of assessment	September 28, 2012

<sup>1</sup> Bureau of Meteorology and CSIRO, 2011; Climate change in the Pacific: Scientific Assessment and New Research Volume 1: Regional Overview. Volume 2: Country Reports.

## **Annex I: Description of Angaur**

### *Background*

Angaur State is located in the southern region of Babeldaob and comprises a total of 3.28 square miles of land area. The state is an island separated by a deep chasm of seawater about 9.38 miles to the south of Peleliu State and about 37.5 miles also south of Koror State, the former capital of the Republic of Palau.

While historically Angaur has had a population of over 500, there are approximately 195 people currently residing in about 45 structures in the state, according to Palau's Census count in 2005. A national census is currently underway with results expected by the end of 2012. Other citizens of Angaur State reside mostly in Koror and other states with many more off-island. There is a public health clinic located on the island for treating minor injuries and run by the Ministry of Health. A grade school for Grades 1-8 is located in Ngermasch village (there are four main villages, namely Ngerbelau, Rois, Ngebeanged and Ngermasch) close to the Marina with a total of less than 40 students. The school is operated under the Ministry of Education. There is a proposal to relocate villagers closer to the former U.S. Coast Guard area in northeast Angaur and several plans for future development of tourism and other small scale businesses if the water problems can be addressed.

### *Water issues*

The availability and access to a supply of good quality water in Angaur State has been degrading over the last couple of decades and has possibly influenced the depopulation trend. There are at least three water sources on the island previously used by villagers where water rises from underground aquifers to the surface and has been tapped by wells. However, several of these water sources are considered no longer fit for human use having become stagnant with an unpleasant sulphuric stench or having become salty as a result of saltwater intrusion. A lack of maintenance has also led to disuse. Water is distributed from a single water-well close to the existing elementary school for all households on the island. This groundwater supply has been declared by the National Government (Environmental Quality Protection Board) unsafe for human consumption and food preparation. Intermittently tested household and community tanks have also been found to have unsafe levels of e-coli contamination.

Angaur enjoys 24-hour electricity, which is necessary for the water distribution and treatment system. But sustainability is an issue in terms of fuel expense for the pumps and susceptibility to extreme weather events (fuel delivery is not possible in inclement weather and infrastructure is easily damaged by typhoons and storm surges). There are other climate aggravated maintenance issues.

With the island's remote location and variable rainfall patterns, as well as difficulties delivering supplies by boat in adverse weather conditions, drinking water at present is limited. Potable water is a vital commodity for any human habitation, and the people of Angaur are already facing serious challenges. The existing water-well currently providing water to households is not fit for consumption and not able to accommodate additional people or development.

### *Options to address climate change vulnerability*

The Airport well, located to the north on the outskirts of the airport, was previously used by the U.S. Coast Guard. This water well has been previously tested and the quality of the water far exceeds the quality of the existing water system presently being used. So with proper management, the people of Angaur can have a safe and clean alternate source of water. The airport water source requires immediate improvement to help in time of droughts. This water source requires housing for protection as well as water pump machines and piping connections. Support for these have been sought through various partnerships but have thus far proved inadequate to fully address the problem. Improving the airport water well will assist the people of Angaur, but is still an incomplete solution, and further support to augment water to households is needed.