

Name of the Project: Vulnerability Assessment, Adaptation Planning and Pilot Activities in Cambodia's Tonle Sap Lake region.

Overall objectives: Assist a Least Developed Country to improve its understanding and assessment of impacts, vulnerability and adaptation to climate change, including climate variation and extremes; and make informed decisions on practical adaptation actions and measures.

NWP work areas to which the pledge is relevant: Methods and tools; data and observations; climate modeling, scenarios and downscaling; climate risks and extreme events; socio-economic information; adaptation planning and practices; research; and economic diversification

Background: The Mekong basin feeds the Tonle Sap River and Tonle Sap Lake which covers almost 400,000 ha at its lowest level, expanding to over 1.4 M ha during the wet season when it is naturally flooded by waters from the Mekong River. The seasonally flooded forests of the lake support one of the most productive inland fisheries in the world, representing approximately seven percent of Cambodia's GDP in 2007 and between 40% and 60% of Cambodia's animal protein consumption. The lake is the largest lake in Southeast Asia and its continued health is essential for food and income security of about 4 million people living surrounding Tonle Sap Lake.

The lake is a highly valued resource accounting for twelve percent of Cambodia's Gross Domestic Product. Flooding of the lake region and surrounding forests by the Mekong River during the wet season creates a fertile breeding ground for fish that contributes to Tonle Sap's fishery sector. It is estimated that one hectare of flooded forest provides over 300 kg of fish that could potentially provide employment and food for one household per year. Climate change is expected to change or delay the flooding, which can effect the fish population.

Project Purpose: To conduct scientific and detailed climate change vulnerability assessment and adaptation activities at two sites, chosen for their high ecosystem service value. These activities will complement other national and regional vulnerability assessment led by World Wildlife Fund, Mekong River Commission (MRC), and Birdlife International in partnership with government. The project is funded by MacArthur Foundation and implemented by CI.

Activities

- **Biological Vulnerability Assessment**

To identify important species and habitats and analyze their susceptibility to climate change, we will map future flood regimes, identify ecological zones for priority protection, and use existing forest cover maps produced by Forestry Administration, Ministry of Agriculture Forestry and Fishery and recent satellite images to identify changes in flood water levels for forests. These images will also allow us to identify flooded forests most likely to maintain the current hydrological regime in the face of reduced water flow due to climate change.

Expected Results

- Mapping flooded forest (boundary demarcation) surrounding Tonle Sap areas and propose action to be taken together with government partners: Fishery Administration (FIA), Tonle Sap Authority, Ministry of Water Resource and Meteorology (MOWRAM) and Ministry of Environment (MOE).
 - After identification of areas of seasonally inundated forests that are impacted by climate change is complete, we will work with the local communities and relevant government departments to formulate an action plan.
 - Prioritize conservation and restoration efforts (with all relevant partners based on study results)
- **Community Vulnerability Assessment**
To define a community's vulnerability and extent to which ecosystem management can help build adaptive capacity, we need to understand: 1) the expected changes in livelihood sources; and 2) the capacity of community to adjust to those changes, which is dependent on socioeconomic factors such as individual health, ownership of assets, and income and education levels. To understand the potential for ecosystem based adaptive capacity building we will survey households and local groups for a) local-level dependence on natural resources, b) climate change experiences and observations, and c) overall adaptive capacity.

Expected Results

- In context of Principle 2 of the Convention on Biological Diversity, which acknowledges that "management [of natural resources and biodiversity] should be decentralized to the lowest appropriate level" plans reflective of local needs can be especially successful in garnering long term community support and management. The survey information will thus facilitate the creation of workable adaptive management plans narrowly tailored to local interests and local hardships (Decentralized must be in line with the government policy framework, and especially respect to the recent reform of the Fisheries sector in Tonle Sap region).
 - CI will establish a database of the annual impacts of climate change, by comparing these responses with those from our 2009 preliminary surveys. This will also help us gather anecdotal baseline information for climate change impacts.
 - Database of the annual impacts to climate change will effectively be used and shared with development partners and others research institutions.
 - Adaptation strategy will be developed drawing on a combination of scientific and local knowledge.
- **Community Workshops and Participatory Analysis**
We will organize a series of community level consultation workshops with stakeholders to conduct a participatory analysis of possible management options. These options will aim to ensure ecosystems' adaptive capacity and their provision of long-term benefits and to meet sustainable development of the Tonle Sap region.

Expected Results

- Use local knowledge, scientific expertise, and local policy-makers' experience to brainstorm appropriate restoration and protection natural resources in the Tonle Sap

- Agreement on the common goals and develop fishery management plan with participation from relevant key stakeholders to protect natural resources in the Tonle Sap in order to meet the goals of sustainability
 - Develop a monitoring plan to facilitate a long term participatory monitoring framework in sites
 - Develop capacity building packages on local adaptation of climate change for local communities, promote their ownership, and integrate adaptation activities into district socio-economic development plans
 - Enhance stakeholder participation in the project thereby encouraging community interest in sustainable management. Such interest is imperative in ensuring long term community cooperation in sustainable resource management
- **Pilot the Suitability of Specific Ecosystem-based Approaches**
CI will support community led feasibility tests of pilot options based on workshop recommendations. These pilot activities may include restoration of flooded forests, sustainable livelihood options and implementation of a monitoring scheme.

Expected Results

- Restore flooded forests by tree planting and capacity building of local communities
 - Promote small scale aquaculture as value added economic diversification activity to support the system
 - Continue and strengthen community participatory processes in the selected pilot testing
 - Encourage local government to participate and join the implementation processes
 - Mainstream adaptation strategy into local planning processes
- **Work with Decision Makers to Develop a National Strategy for Freshwater Adaptation**
Establish a national Climate Change Sub-Committee under the Technical Working Group on Fisheries. This sub-committee will collaborate with government agencies to develop policies related to climate adaptation priorities for Tonle Sap fisheries on a broader scale.

Expected Results

- Link local level fisheries data with national policies. This will facilitate a bottom-up approach, ensuring that the national agenda is supportive of local adaptation initiatives
- Demonstrate field-testing results to influence policy makers as basic knowledge to make necessary changes in national policy development.
- Cambodia's National Adaptation Programme of Action (NAPA) does not currently address the impact of climate change on fisheries. The Sub-Committee will work to ensure cohesion and informed formulation of adaptation policies, which will assist CI to fill the gap in fisheries policy in Cambodia
- Establish networking, strengthen coordination mechanism with national government agencies, and introduce key elements of freshwater adaptation strategy, and find out where and how to link with national government policies.