**GEF Small Grants Programme**
**Community-Based Adaptation in Small Island Developing States - SIDS CBA**

# Management of Water and Fisheries Resources to Improve Community Livelihoods in Battambang

**Project No: KHM/SGP/CCBAP-Sida/2011/55**

**Grantee: Action for Khmer Aid Service**

**Location: Kampong Preang, Battambang Province, Cambodia**

**SGP Contribution: US$49,967**

**In-Kind Co-Financing: US$9,965**

**Project Duration: September 2011 – November 2012**

**Number of people served: 3,573**

**Focal area: Water and Food Security**

## Background

Kampong Preang is a commune located in the Sangke District of Cambodia's Battambang Province. This Province was identified as the second most vulnerable Province to climate change risks in the National Adaptation Programme of Action (NAPA Cambodia 2007). The NAPA research also revealed that drought and flooding are the two main extreme climate risks in Cambodia. Battambang experiences the highest level of drought and the second highest level of flooding in Cambodia. The commune stands along the national road 5, approximately 20 kilometers eastward from the provincial town of Battambang. Two communities, Os Touk and Kach Rotes villages, are home to 797 households or 3,573 people (53% or 1,891 women) who depend on rice farming and fisheries as their main source of livelihood.

Since 2000, the area has been flooded by the Tonle Sap Lake during the months of September and October. Flooding also occurs in the southern upland area during excessive rainfall. In addition to the increased incidences of flooding, extended drought periods occur in July and August. These extreme weather events have severely impacted the production of rice and other crops due to the delays in planting caused by water shortage and young crops subsequently damaged by floods.

The proponent, Action for Khmer Aid Service, conducted Vulnerability Reduction Assessments (VRA) in the Province which indicated that the villages of Os Touk and Kach Rotes were the most vulnerable in the Kampong Preang area. Their assessment also revealed that the area was suffering from chronic loss of forest cover, fresh water shortages, high incidence of livestock deaths, crop pests, inappropriate uses of chemical fertilizers and pesticides, as well as limited access to all crop seeds. Canal networks, constructed between 1976 and 1978, were no longer functioning as water canals nor as flood drains due to heavy sedimentation.

**Figure 1** before the project: rice fields in Battambang were flooded by water from Tonle Sap Lake. October 2010. Photo: Courtesy of SGP Cambodia.

## Project Objectives and Key Activities

The two main climate threats of flooding and drought are predicted to increase in Battambang Province (Cambodia NAPA 2007). Without support, the well-being of local people will continue to be

compromised. The project therefore aimed to strengthen the two communities' resilience to the impacts of climate change and its variability. Partnering with local authorities, awareness-raising and capacity building activities in sustainable water management, together with identification of alternative livelihoods, were considered key for ensuring ownership and long-term sustainability. The following three key activities were selected:

1. Improve irrigation water management through rehabilitation of existing canals and dikes.
2. Identify alternative aquaculture livelihood options and conserve the natural lakes.
3. Raise climate change awareness to the target communities and improve adaptation responses to the impacts of climate change.

**Figure 2** Canal rehabilitation works for improved irrigation and drainage in the target areas. 2012. Photo: Courtesy of SGP

**Environmental Impact**

This project constructed two canals of 9,400 meters in length running across three villages namely Os Touk, Kach Rotesh and a little part of Sala Trav Village. Canal design was developed in partnership with the Provincial Rural Development office of Battambang, with the approval of the Department of Water Resources and Meteorology. The rehabilitation of existing irrigation canals maintained and conserved water to improve agricultural production as well as directing floodwaters out of the villages.

Another key environmental benefit from the irrigation component of the project was the added outcome of conserving the five hectare natural lake (Boeung Thlan) located in Os Touk Village. Traditionally, the lake had been used as a conservation lake for fish refuge in the dry season. Since 2000, the lake had become very shallow and eventually it dried out during the dry season. Under the CBA project, the lake was restored, the banks were stabilised with plants, and the lake was expanded by 10,000$m^2$. 120 kg of fingerlings were released into the lake to improve fish stocks. Furthermore, conserving the lake provided the secondary benefits of providing habitat for local birds, crabs and frogs. Community members have reported significant growth in the number of visiting and different species of birds, particularly during the dry season. The increasing numbers has been exponential since the remedial works were completed and a positive and unexpected outcome of the project. Another unforeseen environmental benefit has been the overall improved local biodiversity and health of the lake ecosystem through reducing the use of chemical pesticides and fertilisers. Reduction in artificial crop inputs has been an outcome of awareness raising activities since the project's inception.

**Figure 3 and 4**: The rehabilitated conservation lake and fish refuge (left) with stabilising plantiing along the embankments 1 year after restoration (right). 2013. Photo: Courtesy of SGP Cambodia.

**Socio-Economic Impact**

As the successful outcomes of the project reveal, the project succeeded in raising awareness on climate change in the target communities. The heightened awareness resulted in a number of behavioural changes. For example, improved water irrigation due to the canal rehabilitation and the lake conservation, meant it was possible to adapt new agricultural practices. For example, before the project, farmers traditionally planted rice in the wet season, only to find their crops regularly destroyed by floods. As seen in Diagram 1, the project changed the cropping calendar from one cultivation period (June to November, with most of the activities done in the middle of this wet season) to two crop cultivation periods – one during the early wet-season (early May to early September) and the other in the late wet-season (late October to early February). The use of short-term rice varieties was promoted to be conducive in these new cultivation seasons. As the farmers took a break from cropping during the flood seasons (September to October), the project introduced drought-resistant varieties to prepare them of drought events. These practices served to increase annual yields as it meant two rice cultivation seasons with the appropriate varieties. The CBA project has helped these communities change previously disastrous floods into a positive opportunity to increase food production and build their resilience to climate risks. It has done this by almost tripling yields in one year. Excess rice can now be sold for income.

**Cropping calendar showing adapted agricultural practices**

| Agricultural practice | May | June | July | August | September | October | November | December | January | February |
|---|---|---|---|---|---|---|---|---|---|---|
| Before the project | | Long term rice | | | | | | | | |
| After the project | | Early wet season (short-term rice) | | | flood period | | Late wet /early dry season (short-term rice) | | | |

Additionally, the project also restored the canal embankment to function as a road using excavated soil from the canal bed. The road was important for transporting agricultural products in the target area but also functions as a dike for keeping flood water from the Tonle Sap Lake between the two villages and the dam. It also acts as a dike to protect the two villages from Tonle Sap Lake flash flood waters in the rainy season. Further, it stores flood water in the upstream rice fields during the flooding period. When the early dry season arrives in November, the stored water is slowly released to irrigate the downstream rice fields. Finally, the road serves as an access-point during disasters.

The project had other socio-economic benefits that strategically built the communities adaptive capacity. For example, local governance for water management was strengthened through the establishment of a Water User Committee. The Committee is responsible for canal maintenance, road maintenance and irrigation water management. This Committee played a critical governance role during the project's implementation such as providing monitoring oversight. It did this by organising the villagers who lived along canal routes to systematically monitor the construction progress. This practice served to provide regular information to the Committee while building strong community ownership for the project.

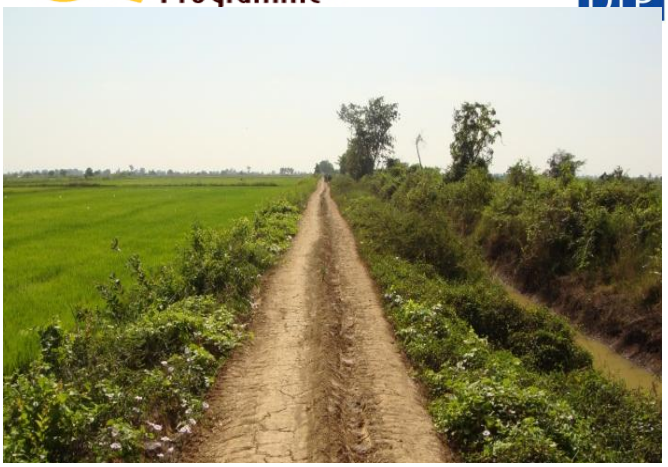

**Figure 5** After the project: restored canal embankments resulted in improved water management, productive rice paddys, opportunities for aquaculture in ponds as well as providing access for daily use and evacuation during extreme weather events. 2012. Photo: Courtesy of SGP Cambodia.

The project also strengthened the capacity of the Community Fisheries Committee members. Community Fisheries Committees are formally recognised by the Fisheries Administration and local authority to sustainably manage community fishing domains. The Committees also play a role in combatting illegal fishing activities. Under the guidance of the Committee, a management plan was developed for the conservation lake and regulations were revised. The regulations were updated to increase and protect fish stocks, and consequently food security through fish protein, by strengthening management measures and establishing a quota system. This is particularly important during extreme weather events, when flooding affects rice yield. These initiatives improved coordination, supported adaptation to climate-induced weather events, and increased socio economic benefits to the target communities.

Another key adaptation initiative was the establishment of four Savings Groups. The Savings Groups enabled the communities to have their own funds for supporting business development. It meant community members could borrow money at the lower interest rate of 2% per month, and without using their property as security (private lending agencies charge 3% and require property as security). This reduced the risks and costs of investing in developments that could strengthen individual and community resilience to climate shocks. The Savings Group profits can also be used for the bulk purchase of farming inputs and fuel for community cost-savings. Further, the Savings Groups act as social safety nets in times of drought or floods as the community has access to savings. A designated local person (often a woman) collects the family's savings on a regular basis and keeps transparent records that are available to all members.

**Policy Impact**

The most significant policy impact to date has been the adoption of the CBA VRA process by the Ministry of Interior into the sub-national Commune Development Planning process. The VRA has been recognized as a good tool for identifying local climate risks and vulnerabilities, and then working through options for appropriate interventions. For example, the National Committee for Sub-National Democratic Development is consulting on the application of the VRA method at the national level and is expected to include it as a key tool in their *Operational Guideline on Mainstreaming Climate Change Adaptation***.** Additionally, at the sub-national level (communes) under the umbrella of CBA, 94 (71%) out of 132 communes, have officially confirmed, through letters received from commune chiefs, that they have already integrated future adaptive

activities from CBA projects into their Commune Investment Plan. The types of activities have included rehabilitation of water infrastructure such as canals, water gates, spillways, integrated farming practices, and awareness raising on climate change impacts. Mainstreaming CBA into sub/national planning processes means that on-going maintenance becomes part of national 'business as usual' and communities can pro-actively lead future adaptation initiatives in partnership with government.

**Gender Mainstreaming**

Gender analysis was applied during the planning stages of the project and gender was mainstreamed into the VRA process. For example, during VRA exercises men and women were seperated into same-sex groups to focus gender needs. The results have been that women were successfully mainstreamed into the project and into community decision-making forums. For example, out of the six Savings Groups established, 107 women (59%) joined as members. 5 women (or 42%) of the Savings Committees management group are also women. Another example can be found in the Farmer Water Using Committee where 3 women (30%) are decision-making members. The Fisheries Committee also features several female members. While women are not represented at the same levels as men, it is a positive start and reflects the same levels of women in decision-making positions as many western countries. The photo on the right shows that concerted efforts were made to ensure young women and girls were included in awareness raising activities.

**Figure 6** Students participating in a climate change awareness programme at the local pagoda. 2012. Photo: Courtesy of SGP Cambodia

**Youth Engagement and Participation**

Both elementary and high school students from Os Touk and Kach Rotesh were targeted for raising awareness of climate change and its impacts. The objective of the activities was to raise the awareness of school children and youth of changing weather patterns and the predicted increase in extreme weather events. The aim was to prepare them so that they can help their family's response to climate change impacts and prepare for any natural disaster.

Overall, awareness training was conducted ten times with almost 2,000 young people attending (49% were female). Videos have been a popular medium with young people. Screenings were well-attended and are followed by Question and Answer sessions to encourage questioning and debate on options. Disaster risk management and preparedness was also included in these sessions to ensure young people were prepared for extreme events and new how to respond if disaster strikes.

**Replication and up scaling**

This project has served as a demonstration centre in Kampong Preang. Since the project farmers started to change their traditional single wet-season rice planting practices, to planting two short-term rice crops, rice

productivity has increased from 2.5 tones per hectare to 5 tones per hectare and nearby villages are now replicating the new farming practices.

The Kampong Preang commune authority was also very happy to see the target communities reduce their vulnerability to climate change and improving their livelihoods. The support of commune administrative arrangements and financial contributions to the project demonstrates their commitment to the approach. Further, the VRA method has helped the commune authority to understand priority community needs which can then be integrated into commune development plans. This project has inspired the commune authority in Kampong Preang to integrate climate change adaptation into all communal development programmes. The project sites now serve as demonstration centres for the commune authorities in order to share the experiences with other villages.

**Lessons learned**

The many achievements of the two villages have provided best practices and some lessons learned during the implementation of this project. The lessons include:

- The most significant lesson was that through improved water distribution management, the target farmers turned former 'disasters' into farming opportunities.
- Through actively participating in implementing this CBA project, commune council members gain more knowledge and skills in designing and implementing CBA projects (learning by doing). For example, they can now coordinate the support from different technical departments during project design and implementation. They can also conduct VRAs and ensure that local needs and locally identified options are included in future plans.
- While this is not a new lesson, the project emphasised that CBA project sites should be most vulnerable to climate change impacts. This is the key to successful execution of a CBA project. The most vulnerable communities, and the local authorities who support them, are often mobilised and ready to take action to reduce their level of vulnerability.
- When community priorities are clearly understood and translated into actions, communities are very willing to participate in project activities.
- Project results will be sustained after the project ends if the local authority and community have a high level of ownership and see themselves as project managers, not the receiver of project products/outputs.
- Involving the Commune authorities is critical as they communicate community needs to pertinent line departments and can seek technical assistance for projects.