



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

Community-Based Adaptation to floods in the Elapatha DS Division of Ratnapura District

Project No: SRL/MAP-CBA/2010/05
Grantee: Sabaragamu Janatha Padanama
Location: Elapatha DS Division, Ratnapura District, Sri Lanka
SGP Contribution: US\$ 42,529
Cash Co-Financing: US\$ 3,000
In-Kind Co-Financing: US\$ 2,200
Project Duration: 11/2010 - 7/2012 (18 months)
Number of people served: 68 families (288 people)
Focal area: Agriculture and Food Security

Background

Sri Lanka is an island nation in the Indian Ocean and despite its relatively small land extent, it exemplifies a variety of climatic conditions depending on the geographical settings of respective locations. It is traditionally defined into three climatic zones: the “wet zone” in the southwestern region, the “dry zone” predominantly covering the northern and eastern parts of the country, and the “intermediate zone” which separates the two other zones and skirts the central hills except in the south and the west. There are four rainfall seasons, two of which fall under the major harvesting season, ‘Maha’ (Mid-September/October to February) and two under the ‘Yala’ harvesting season (March to September). Rainfall is the main contributor to Sri Lanka’s high agro-ecological diversity.

Economically, agriculture – in particular, paddy cultivation was and continues to be the main source of livelihood for many.

Sri Lanka is under threat from climate change impacts and its variability. The threats include increases in the frequency and intensity of disasters such as droughts, floods and landslides, variability and unpredictability of rainfall patterns, increase in temperature, and sea level rise, among others. Moreover, cyclones are anticipated to increase in strength. Being an island country, sea level rise will affect Sri Lanka’s infrastructure, tourism, fresh water availability, coastal wetlands and the livelihoods of people in low-lying coastal areas.

The Dellaboda village is located in the Ratnapura District in Sri Lanka’s “wet zone” where annual rainfall varies between 2500 mm to 5500mm. The village is home to 288 people who, for many centuries, have relied on paddy cultivation and other farming practices for subsistence and income. Over the past decade, climate change impacts and its variability have extremely altered rainfall patterns, which have led to either floods or droughts. A major flood in 2003, with a record rainfall of over 318mm within 24 hours, left the area devastated with approximately 90 lives lost and with the majority of the village rendered homeless, amidst the food shortage due to agricultural crop destruction and potable water scarcity. Since then, the communities have been inundated with up to 5 major floods a year, prohibiting 63% of the area’s farmers from producing enough food for the community’s consumption and perennial crops for cash income. Due to these adverse conditions, some farmers have been forced to abandon paddy cultivation and sought other livelihood options such as illegal river sand and gem mining. Additionally, weeds have thrived in the abandoned paddy fields which have attracted pests such as birds and insects, resulting to more crop losses.

Project Objectives and Key Activities

The project’s objective was to strengthen the communities’ resilience to the adverse impacts of climate change and its variability by building their capacity to combat floods. The key activities included the renovation of canal systems for effective drainage, especially during heavy rainfall; the introduction of flood-resistant paddy crop varieties, the improvement of home gardens, and establishment of seed banks to overcome the scarcity of seed paddy and other food crops.

The flash floods have caused immense damage to irrigation channels and waterways around Dellaboda and the adjoining hamlet of Modera. Hence, an irrigation channel was constructed to distribute waters to a paddy tract (Muththetu Godella) which is damaged during each flood, which also serves as a channel for removing flood waters. The construction was completed according to the specifications of an irrigation engineer from the government, with voluntary labor ('Shrama Dana') continuously provided for 30 days by the community members. The landowners, who sublet their fields to the farmers ('Ande' tenure system), provided free meals and refreshments to the working groups. The villagers' commitment and dedication throughout the project period, along with the materials they contributed, saved funds from the project budget. These savings resulted in the channel being extended by 100m, reaching its neighboring community, the Modera village.

Additionally, whilst being located between the Niri Eli Ganga and Hangamu Ganga streams, whose waters flow into one of the country's main rivers (Kalu Ganga), the streams are heavily silted and are unable to absorb floodwaters during heavy rains. As such, water remains longer in farmers' lands and cause further damage. Therefore, in addition to the construction of water channels to relieve the fields of excess water, flood-resilient species were introduced. These species included short-duration improved varieties and traditional paddy varieties such as Maa Vee which have longer stems and are able to withstand certain level of floodwater for several days.

To protect seeds and plants from floods and droughts, 81 home gardens and plant nurseries were developed. Additionally, the use of organic farming methods such as composting and the use of herbal fertilizers and pesticides were introduced. Appropriate certified paddy seeds were purchased from the Department of Agriculture and seed banks were established to ensure the on-going availability of the seeds.

A participatory approach was used from the concept formulation to the project implementation stages that ensured the communities' concerns were heard and addressed with viable solutions. Building on the communities' knowledge and experiences, project partners such as scientists from the Peradeniya University of Sri Lanka, senior officials from the Rice Research Institute and technical officers from the district's Irrigation Engineers Office provided regular technical support at the community meetings. The scientific data shared with the communities, such as temperatures and humidity in the agro-climatic zones specific to the project area, rice agronomy, agricultural yields, pests and diseases, and integrated pest and soil management have raised the communities awareness and built their capacities on climate change and its effects on their ecosystems, food and water security. As a result of these stakeholder meetings, sensible and sustainable solutions were determined and agreed upon such as the practical irrigation system design.

The Vulnerability Risk Assessment (VRA) tool used in the project is a methodology based on the communities' assessment of current and future climate change risks and their perception on the associated vulnerabilities on their livelihood and welfare. It was conducted at the beginning, the middle and the end of the project. The VRA results showed that the communities' confidence has increased with regard to their abilities to cope with climate change-induced impacts. At the project inception, the villagers, who are traditional farmers from ancient times, were reluctant to seek new knowledge and practices. The project's strong focus on participatory and inclusive approaches along with its awareness-raising and capacity development initiatives resulted in solidarity, ownership and increased capacities of the community members. In turn, these results led to the communities' empowerment and transformation in adapting to climate change.

Environmental Impact

The positive impacts on environmental conservation can be seen in both the paddy fields and home gardens. Before the project, 180 farmers used heavy chemical fertilizers for paddy cultivation. Now, 89% of the village farmers are following natural farming methods of compost, liquid organic fertilizers, mulch, and use of natural herbicides and pesticides. Only 20 village farmers (11%) depend on chemical fertilizers such as synthetic versions of urea. As a result, the health of farmers has improved and the incidences of deadly fevers such as *Leptospirosis*

and dengue have been reduced. Additionally, a reappearance of fish, dragonflies, and other beneficial insects and birds in the paddies, is now being recorded.

Over 8 hectares of land have been restored with the development of home gardens using organic farming methods. The application of soil conservation and other protection measures, such as live fencing around the home gardens with *Gliricidia sepium*¹, provide fodder and enrich the soil. Furthermore, the home gardens provide organic and nutritious food for the family and reduce the need to purchase vegetables from the market.

Socio-Economic Impact

The construction of the water channel was the biggest investment of the project providing tremendous benefits to the village. Due to the regular availability of water from the channel, the farmers are now able to cultivate paddy rice and other crops such as okra, gourds, long beans and green leafy vegetables in the two harvesting seasons ('Maha and Yala'), thereby, increasing the production yields. With the increased yields and the training on crop quality and price-setting, the farmers are able to negotiate and receive better prices for their harvest. Additionally, the community members have learned that their experience, knowledge and common sense is sometimes more practical than the knowledge of technical officers. For example, when the channel was being designed and constructed, the village elders offered advice to the officers which led to more sustainable and efficient outcomes. For example, officers from the Department of Irrigation designed the canal calculating capacity and water requirements of the communities. However, village elders, who have repeatedly experienced flooding and the associated destruction of crops and land, advised the officers to raise the height of the canal by several inches to increase its capacity during heavy rains as well as the impact of receding waters after the rains. While this advice was initially neglected by the technical officers, following the elders' guidance resulted in a more even flow of water and better control of the excess water.



Cultivated paddies flourish with upgraded water channels that bring water during extended dry seasons as well as help to reduce flooding.
Photo: Tharuka Dissanaike, 2012

The extension of the water channel provided water access to the Modera village. As such, a decade-long animosity between the two communities, caused by caste segregation and conflicts over water management was ended. The maintenance of the channel is managed by the 'Farmers Society' consisting of members from both villages. Lastly, the relationships of the two communities have strengthened with the state sector institutions such as the Departments of Irrigation, Agriculture, and Agrarian Services, the provincial council, local government authorities and national level programmes. It brought benefits such as development of a road along the channel, enabling tractors and other vehicles to reach remote farmers. The road benefited the previously poor and marginalized village of Modera by providing secure access to the town.

The home garden programs have resulted in self-sufficiency and food security for the family. The training processes developed the capacities and increased the confidence of women farmers. At present, the production yields from home gardens contribute a substantial portion of household incomes, generating as much as 30% of

¹ It is considered as the second most important multi-purpose legume tree. Since it is easily propagated and grows quickly, it is widely used for live fencing, fodder, coffee shade, topsoil erosion reduction.

their monthly income for some families. Their new knowledge on composting, organic farming methods, and soil and environmental conservation, has also generated extensive benefits such as the cost and quantity reduction of purchased inputs. Home garden yields are now monitored by the women who record information on the amount of produce that are sold and those that are consumed by the family. The inventory management enables the women to quantify household savings on food purchases, profit from the sales investment on seeds and inputs for the next season.



Women's home garden size, health and productivity has increased since improving water management and including women's groups from both communities into the project. Photo: Tharuka Dissanaikie 2012

Through the Credit Scheme, members have been able to obtain loans such as distress, medium and long term loans at a maximum of 14% annual interest (much lower than the average commercial annual rates of over 16%, and at times over 20%, in Sri Lanka). Some women members have taken advantage of the credit facilities and opened retail shops in the village. For example, an innovative effort launched by one female member is selling pre-made lunches to laborers with their traditionally grown rice and home grown vegetables.

Policy Impact

The project worked closely with officials from the Departments of Agriculture and Agrarian Service who participate in national level meetings, with one senior officer being the adviser on climate change to several government agencies. Their exposure on the village-led project activities has dramatically raised their awareness and stimulated different ways of addressing a population's vulnerability, such as using a participatory methodology, using the knowledge and respecting the ideas of the villagers as its inhabitants would know their ecosystems the best. The established affiliations have fostered community-specific climate change adaptation concerns being mainstreamed into local, provincial and national development efforts

Additionally, with these collaborations, non-effective processes have been identified by the government. For example, the government agencies have realized the importance of quick response to the rehabilitation and strengthening of vulnerable infrastructures, such as water channels and anicuts, on which communities rely for their livelihoods. Post-damage repairs and construction are costly and a lot of times, deemed ineffective. Lastly, recognizing that the government does not have the sufficient funding and resources to address the various problems arising from the nationwide climate change issues, the government is now re-evaluating its current process and finance mechanisms to mainstream CBA innovations and channel scarce resources to reach the high-risk communities. For example, the current government procedures of outsourcing services for infrastructure development have to be re-designed and take into account the communities' ideas and contributions. As seen in the water channel construction, communities' ideas, spirit of volunteerism and actions minimized the costs while achieving better results.

Youth Engagement and Participation

The openness and transparency with which the project activities were undertaken attracted young people and subsequently, changing the attitudes of some village youth. Young people were interested in the idea of

mobilizing village members for a common good and thus, volunteered their labor for the water channel construction. Young people have expressed that being able to contribute to positive developments in their village has led to better family relations and shedding of anti-social habits. The village elders reported that activities such as illicit liquor brewing and gambling which were spreading in the village were eliminated during the project's implementation period.

Gender Mainstreaming

Women were in the forefront of project activities right from the start. They participated in all decision-making meetings from the planning to the project follow-up stage. In the Farmers Society, women accounted for 62% of the general members and 53% of the executive members.

The home garden component was embraced by women as an enterprise that would enable them to earn an income, provide nutritional food for the family, guarantee food security, conserve the environment and promote their status in the community. The women take a keen interest in their home gardens and several of them have entered national home garden competitions with some winning awards. This has been a great source of pride and brought them recognition at the district and national levels.



Women hold leadership roles within the Farmer Organisation. This helps ensure that other community members contribute their time and labour for project activities. Photo: Tharuka Dissanaiké 2011

During VRA exercises, female participation was over 65% which further demonstrated their interest and commitment to seeking solutions to the problems their community faces.

The best practices and lessons learned from this project will be disseminated to inform national processes and practices. Additionally, they will be shared with neighbouring communities through government extensions and NGO interventions for wider adoption.

Lessons learned

The following lessons learned were generated throughout the life-cycle of the project. Some of the key lessons that can help others who face the challenges brought on by climate change, specifically floods, and its variability.

- The following conditions exacerbate the vulnerabilities of the poorest subsistence farmers to climate change, compounding their status to be silent victims of climate change: lack of awareness amongst farmers on the climate change-induced impacts on livelihoods, non-availability of agriculture extension facilities in many areas, limited technical advice on crop varieties and choices, and limited ability to affect water management.
- While home gardens are effective buffers against climate change and its variability, its continuous maintenance may be a challenge especially in the increasingly long dry seasons. It is important to find viable solutions that are accepted by the farming communities. While drip irrigation is a good solution, in

Sri Lanka, having perennials such as mango and coconut trees is an adaptation practice that is locally accepted to support the families through the longer dry seasons.

- Many communities have been applying adaptation measures (e.g. application of flood-resistant traditional paddy) for centuries to protect themselves and their ecosystems from climate change impacts, however, a lot of their adaptation strategies are not translated into actions due to lack of organized effort within the community and lack of state interventions. Therefore, providing linkages and synergies are very important to ensure that they have access to institutional, financial and government support, as well as mainstreaming CBA innovations for widespread benefits.
- While the funds from the CBA project may be deemed as small, it was able to catalyse change beyond the project's framework. The participatory and inclusive approaches used by the project instilled solidarity and teamwork within the communities during the course of the project. In turn, results achieved surpassed on what was originally planned in the framework.
- Transparency has to be maintained at all levels to obtain community commitment.
- During VRA exercises, communities identified that a key adaptation barrier was the lack of finance to invest in solutions and a lack of local/provincial government support.
- Once the positive adaptation impacts of project initiatives are shared with government stakeholders and the outcomes are articulated and visible, government can become a strong partner providing encouragement, technical support and co-financing.
- For strategizing adaptation initiatives, comprehensive baseline data has to be in place to develop indicators and to address issues of food security, self-sufficiency and increasing incomes.
- Risk-transfer schemes, acceptable to both farmers and insurance providers, are essential to protect farmers against recurrent floods, other natural calamities and crop damage.