SGP The GEF Small Grants Programme 25 YEARS

Local Action: Global Thinking

Voices from the Field

Community Based REDD + Projects
&
Selected Global Environment Facility-Small Grants Programme
OPV funded Projects
Sri Lanka

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CBR+

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Community Based REDD + Projects and Selected Global Environment Facility-Small Grants Programme OP V funded Projects in Sri Lanka

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Dinali Jayasinghe
National Coordinator of GEF-SGP

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Strengthening the Community Actions for a Better Conservation

Upscaling of SGP projects

GEF Full Size Projects (FSP)

Abbreviations & Acronyms

ac.	- Acres
ACDC	- Aranalu Community Development Center
AfATE	- Alliance for Appropriate Technology Exchange
BRIT	-Biodiversity Research, Information and Training Centre
CD	- Capacity Development
CBO	- Community Based Organization
CBR+	- Community-based REDD+
CDC	- Community Development Centre
CEA	- Central Environment Authority
CEJ	- Centre for Environmental Justice
CENYO	- Center for Youth Organization
CES	- Centre for Eco Cultural Studies
CFL	- Compact Fluorescent Light
CKDuE	- Chronic kidney diseases of unknown etiology
CRPC	- Community Resource Protection Centre
CSO	- Civil Society Organization
DS	- Divisional Secretariat
DSD	- Divisional Secretary's Division
DWC	- Department of Wildlife Conservation
EIA	- Environmental Impact Assessments
EPSKMS	- Ekabadda Praja Sanwardhana Kantha Maha Sangamaya
FD	- Forest Department
FFPO	- Fauna and Flora Protection Ordinance
FIOH	- Future in Our Hands Development Fund
FOGSL	- Field Ornithology Group of Sri Lanka
GEF	- Global Environment Facility
GHG	- Green House Gas
GIS	- Geographical Information System
GN	- Grama Niladhari
GND	- Grama Niladhari Division
ha.	- hectare
HCB	- Hexachlorobenzene
HDPE	- High Density Polyethylene
HEDO	- Human and Environment Development Organization
HELPO	- Human and Environmental Links Progressive Organization
IAS	- Invasive Alien Species
IDEA	- Integrated Development Association
IEE	- Initial Environmental Examination
IEO	- Integrated Environment Organization

IUCN	- The International Union for Conservation of Nature
Km	- Kilometer
Kw	- Kilowatt
LED	- Light Emitting Diodes
LKR	- Sri Lanka Rupees
MAB	- Man And Biosphere
MEIP	- Metropolitan Environmental Improvement Programme
MENR	- Ministry of the Environment and Natural Resources
MIMEDF	- Mihithala Mithuro Environment Development Organization
Mt	- Metric Ton
NCF	- Nature Conservation Foundation
NEUF	- National Ethnic Unity Foundation
NGO	- Non Governmental Organization
NIE	- National Institute of Education
NIP	- National Implementation Plan
NMT	- Non-Motorized Transport
NRC	- Nature Resource Conservation
NRMC	- Natural Resource Management Centre
NTFP	- Non Timber Forest Products
OARM	- Organization for Aquatic Resource Management
OP	- Operational Phase
PCB	- Polychlorinated Bi Phenyls
PCDF	- Plantation Community Development Forum
PILF	- Public Interest Law Foundation
POP	- Persistent Organic Pollutants
PVC	- Polymerizing Vinyl Chloride
REDD+	- Reducing Emissions from Deforestation and Forest Degradation
RRI	- Rubber Research Institute
RSS	- Ribbed Smoked Sheet
SGP	- Small Grants Programme
SLAPP	- Strategic Litigation Against Public Participation
SLEES	- Sri Lanka Environment Exploration Society
SLLRDC	- Sri Lanka Land Reclamation and Development Corporation
ISTF	- International Society of Tropical Foresters
TERN	- Tropical Ecosystem Research Network
UDA	- Urban Development Authority
UNDP	- United Nations Development Programme
WDF	- Women's Development Foundation

Part I

Protecting Forests: Empowering Communities

Projects Implemented Under the Community Based REDD+ Programme Sri Lanka

Introduction

Community Based REDD+ progamme has been implemented in Sri Lanka since 2014. In the past three years the eight grant projects selected to address REDD+ concerns, mainly in reducing emissions from deforestation and forest degradation, foster conservation and sustainable management of forests, have stayed the course and produced results worthy of sharing with a wider audience. A further two grants were awarded for knowledge management and capacity building in order to improve community proficiency in achieving goals. The present symposium is held to share experiences at local level, of communities who have undertaken conservation with enhanced awareness and commitment.

Globally, CBR+ aims at supporting community-level projects that complement UN-REDD National Programmes, national REDD+ readiness processes and/or strategies. In this pilot phase, CBR+ is implemented in six countries: Sri Lanka, Cambodia, Panama, Paraguay, Democratic Republic of the Congo and Nigeria. At country level CBR+ forms a partnership between the UN-REDD Programme and the GEF Small Grants Programme (SGP), especially in grant selection and monitoring at the local level and in empowering communities and indigenous peoples to engage in REDD+ readiness activities and develop experiences, lessons and recommendations to feed into the national REDD+ processes.

The global CBR+ programme was made possible through a generous contribution from the Government of Norway, co-financed by SGP. CBR+ grants has an upper limit of US$ 50,000, for communities to engage in the design and implementation of activities and to develop experiences, lessons and recommendations.

The focus areas for CBR+ Sri Lanka projects were identified as participatory processes for community engagement, community-based approaches to address drivers of deforestation and forest degradation and draw lessons from specific studies of land-use change, such as changing patterns of shifting cultivation and associated encroachment of forest lands, conflicts around or lack of clarity of land ownership, development projects for agriculture, among others. Accordingly, community grants involved forest-dependent and indigenous communities, raising awareness of these communities on REDD+ and empowering them to participate in conservation. With regard to the expectations of stakeholders, supporting boundary demarcation, minimizing possible forest fires, establishment of forest-management groups, and income generating activities were conducted.

Sri Lanka funded 10 initiatives for the CBR+ programme, eight of which were on the ground projects implemented with community participation. Two projects aimed at supporting and facilitating the implementation of the 08 CBR+ projects for knowledge management and capacity building of partners. All projects are showcased in the Symposium as presentations and posters.
In Ampara district National Ethnic Unity Foundation (NUEF) worked with a remote community living adjacent to a forest reservation, weaned them away from cultivating finger millet in forest lands by introducing alternative income means and empowered to protest against commercial cultivation of finger millet in large tracts of forest lands.

An all island effort to take action against drivers of deforestation was undertaken by Centre for Environment Justice (CEJ) to engage local communities and CSO partners through awareness raising workshops, meetings, discussions and thematic events. A web based forest crime monitoring and a reporting mechanism with a hotline was launched to report crimes, prioritize locations for conservation and engage in conservation measures.

The CSO, Future in Our Hands (FIOH), with the participation of communities addressed forest encroachment and forest fires in a dry zone forest in Badulla district. Measures were taken to minimize encroachments for chena and finger millet cultivation in forest lands, control fires through installing fire belts, minimize spread of invasive alien species and tree felling.

Women's Development Foundation (WDF) embarked on a partnership project with the Indigenous People or the Vedda Community of Sri Lanka, in Badulla district, whose way of life and conservation practices is of great importance to the country. The project's aims were to promote sustainable utilization of forest resources, share knowledge and learn from and document traditional knowledge, values and practices.

In the Udawalawe National Park in Ratnapura district, with the highest density of the Asian Elephant, Elephus maximus, intense competition for the lush grass is faced by the elephants due to the large numbers of cattle being released to the park for grazing. Ekabadda Praja Kantha Maha Sanwardana Sangamaya (EPKMSS) attempted to conserve and minimize degradation through weaning cattle out of the park and the adjoining Bambaragala Mukalana Forest through mobilizing communities.

The Public Interest Law Foundation (PILF) established a legal aid and advisory service to assist forest dependent communities to seek legal and administrative relief on forest and wildlife issues, in Anuradhapura district. Court action was only taken as a last resort. The project also sought to create awareness amongst

communities and lawyers on Forest and Wildlife laws, Environmental Impact Assessments (EIAs) and CB REDD+ Sri Lanka programme.

The Madu Road Sanctuary and the Forest Reserve in Mannar district is an area that has been subject to heavy deforestation and destructive earth extraction measures. The National Forum of climate change (NFCC) worked with 400 households in two resettled villages creating awareness on forest conservation and sustainable utilization of natural resources to address issues of water scarcity and poverty.

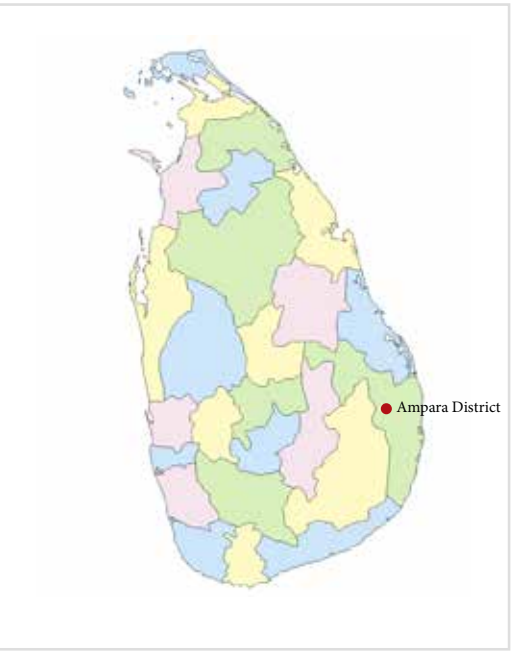
Two villages – one within the Uda Walawe National Park, the other adjacent to a forest reserve were selected to pursue issues of forest fires and cattle grazing. The CBOs Illukpelessa Community Organization and Baduludena Death Donation Society managed the work funded through Sabaragamuwa Community Development Foundation.

Knowledge Management and Capacity Building for the eight field implemented projects were the responsibility of two organizations, Tropical Ecosystem Research Network (TERN) and Janathakshan Gte Ltd. They supported the work of grantee partners from project formulation stage, through aspects of project implementation to evaluation, to ensure the achievement of the expected results and impacts. As an integral part of knowledge management they facilitated documentation, data compilation, photo and video recordings, capacity building workshops to enable experience sharing, mainstreaming and replication of best practices.

The CBR+ projects described above illustrate the work undertaken with communities who rely mainly on natural resources for making a living. The projects of 18 months' duration aimed at building capacities and empowering communities to engage in the implementation of projects that address protection of forests and thereby contribute to the fulfilment of broader environmental and social goals, including biodiversity conservation, climate change adaptation, enhanced food security, improved rights and livelihoods of indigenous peoples and local communities.

CBR+ implementation processes, the community awareness, partnerships formed at official level, the sharing of lessons that feed into the national programmes, demonstrate that CBR+ has been able to bridge the gap between local communities and national and international efforts in addressing REDD+ concerns and that forest dependent communities should be in the frontline in conservation efforts. In Sri Lanka communities have been able to take full advantage of the opportunity presented to them through CBR+, showing that a bottoms up approach is a key element in ensuring support from the grassroots for the REDD+ programme.

Community Based Protection of Bakmitiyawa Thimbirigolla Reserve



Project title:	Community based protection and conservation of Kiwulewatta village bordering Bakmitiyawa Thimbirigolla reserve, Ampara District
Project Number:	SRL/CBR+/2015/05
Focal Area:	Community Based REDD+(CBR+)
Duration:	18 Months (2015-2016)
Implementing organization:	National Ethnic Unity Foundation (NEUF)
Address:	Police Quarters Road, Ampara
Contact No:	+94 77 326 5174
Email Address:	neufampara@gmail.com
GEF/SGP funding:	US$ 50,000.00 / LKR 6, 688, 000.00

A traditional "Pathaha" (pond)

Introduction and objectives

Thimbirigolla Bakmitiyawa Reserve spreads over 47,000 hectares in 04 DS Divisions in Ampara district. Over 20 villages are located along its periphery. The reserve is under increasing threat of encroachments which were intensified after the end of the civil conflict in 2009. The main reason for the encroachment of the reserve in the Damana DS Division is cultivation of commercial crops such as maize, both by the villagers and outside farmers. Kiulewatta is one of the villages located adjacent to the reserve in Damana DS Division. The villagers who were traditional chena cultivators started growing maize or Indian Corn in the forest land when the price of maize began to fetch high prices. They could do their cultivations inside the forest without hindrance for a number of years. The encroachments expanded vastly with external groups, mainly when businessmen started clearing large tracts of forest land to grow maize on a commercial scale. The objective of this project was to minimize encroachments, protect the forest with the engagement of the Kiwulewatte village community and to assist government institutions in the conservation of the forest reserve.

Activities and achievements

An initial activity of the project was to mobilize the village community and raise awareness of the importance of forest protection. As a marginalized community who had not received any attention to their livelihood concerns and have not been given government assistance to improve income, careful guidance was needed in weaning them from present cultivation practices inside the forest and proposing ways of cultivating their own lands or doing alternative activities which would give them a better income. A community based organization (CBO) was formed

and awareness programmes were held frequently to obtain the community's fullest participation for the activities. Discussions were held on the causes and effects of forest degradation, lack of water for cultivation, prolonged droughts and other topics relevant to their lives.

Within a two-year period, the project was successful in initiating small businesses such as a grinding mill, a retail grocery shop to strengthen the financial capacity of the CBO and its members. Other income earning sources such as poultry management, sewing of garments for village members were introduced. A micro credit programme was initiated to provide credit facilities to the members of the CBO to start small businesses and agriculture activities. With the introduction of alternative livelihood means, the community members who were illegally using the reserve for cultivation purposes were convinced to stop further encroachments and to enter into an agreement with the Forest Department to conserve the reserve by converting the existing cultivated forest lands in to agro forests. Under the agreement the villagers have approval to collect NTFPs from these agro forestry plots. The plots will help to gradually increase the forest cover as desired by CBR+. In addition home agro forestry plots of 1/2 an acre hectares were established in 40 plots in the village. Several plant varieties such as mango, orange, coconut were distributed for the plots. Drinking water supply of the villagers was assured during the dry season through the construction of an agro well to supply the water for agricultural purposes during the dry season to 04 families and 10 traditional water ponds were rehabilitated for use of individual families.

Impact and Sustainability

The villagers were of the mistaken belief that there is plenty of forest cover to go around, and declared that even if they stop their activities, others, either from the village or from neighboring areas, will use the forest land for economic benefits. An impact of the project therefore is the success in changing attitudes of the villagers and bringing them into a position of agreeing to protect the forest for their own benefit. Building mutual trust through participatory decision making and building close working relationships were instrumental in this.

The increase in monthly income of fifteen beneficiary families by LKR. 15,000.00 (US$.98) through alternative livelihood activities led villagers towards converting their illegal Chena lands into agro forests through an agreement with the forest department. The project was able to add 05 acres of cultivated lands back to the forest at the end of the project by converting them to agro forests. Further the villagers have expressed their willingness to convert another 20 acres of cultivated land to agro forests.

Poultry farming as an alternative livelihood

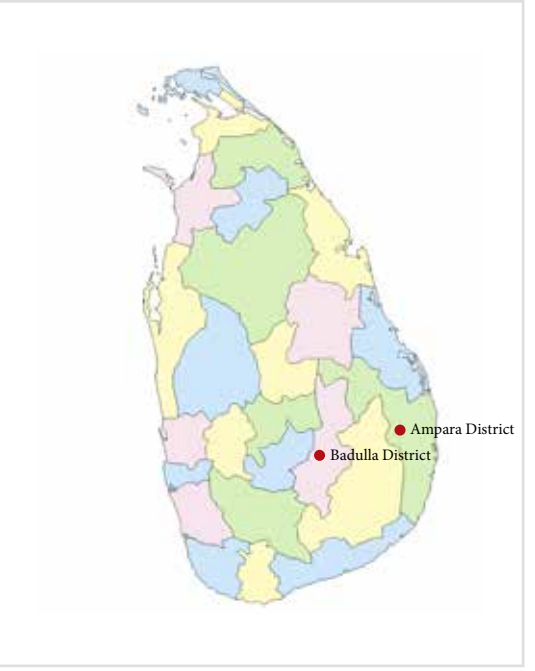
Construction of agro-wells to supply irrigation water for agriculture

The CBO established under the project is financially strong as it is generating income through providing micro credit and the income received from the grinding mill will help in sustaining the activities in the future.

Lessons Learnt

The reasons for deforestation and forest degradation are clear but efforts to reverse the trend requires a holistic intervention method. The CSO's efforts to reduce deforestation could not reach expected levels during the short project period but the efforts undertaken show that it is possible to change behavior patterns with the right mix of awareness and incentives. The villagers are willing to give up cultivation of maize and the encroached forest lands if they are compensated with more planned, clear and sustainable livelihood options. A clear strategy and a plan is essential with the participation of all the relevant stakeholders i.e. community, forest department, divisional secretariat to reclaim the encroached forest lands through a win-win approach.

Engaging the Indigenous Vedda Community of Sri Lanka in the REDD+ Process



Project title:	Empowering forest dependent indigenous communities to promote sustainable utilizatio of forest resources and document their traditional knowledge, values and practices, Badulla and Ampara District
Project Number:	SRL/CBR +/2015/10
Focal Area:	Community Based REDD+ (CBR+)
Duration:	18 Months (2015 – 2016)
Partner organization:	Women's Development Foundation(WDF)
Address:	No.26, Sirimalwatte, Gunnepana, Kandy
Contact No:	+94 71 837 7526
Email Address:	wdf@gmail.com
GEF/SGP funding:	US$ 50,000.00; LKR 6, 688,000.00

The Vedda Chief participating in a tree planting activity for catchment restoration

Catchment restoration at Dambana, Gurukumbura tank

Introduction and Objectives

The REDD + concept nationally and globally places great value on indigenous communities and their relationships with nature, specially the forests. This has led to the essential inclusion of indigenous people and their contribution to forest protection in the CBR+ process.

The Women's Development Foundation (WDF) implemented this project in partnership with the Indigenous People or the Vedda Community in Sri Lanka whose way of life and age old practices is of great cultural importance to the country. The Vedda People live in several small communities, estimated at six or seven, dispersed within the lowlands of the country. Although their traditional way of forest living dependent on hunting and gathering disappeared decades ago and changed overtime, some of them still depend on the forest for their needs and livelihoods, mainly for subsistence (chena) agriculture. The key objectives of the project were to promote sustainable utilization of forest resources by the Indigenous People focal group share knowledge and learn from and document their traditional knowledge, values and practices. These include estimating their current sources of income, value addition to products they market, and introducing environmentally friendly means of income earning to reduce pressure on the adjacent forests. The project selected 100 beneficiaries from the community in Dambana in Badulla district and 35 beneficiaries from Hennanigala in Ampara district.

Activities and Achievements

From the project conception stage onwards the project activities were discussed with the Vedda Chief, Uruwarige Wanniyale aththo, who is a wise but tough negotiator and other members of his community. This was mainly for building

Value added Coixlacryma jobi products developed by the indigenous community

trust and agreeing on minimally intrusive ways of working with a community who has a distinct way of thinking and living. The Vedda Chief's consensus was important for his understanding of his people and for the necessary guidance to implement the project effectively. A main activity was to plant 3525 saplings in 125 home gardens and in 50 acres of abandoned Chena lands to increase forest cover. Over 60% survival was observed for the plants. 1500 trees were planted in catchment areas of Dambana Gurukumbura tank and Henanigala tank. The responsibility of maintenance of plants is shared among 65 families, with children being appointed as "guardians of the plants". As an appreciation of this activity, each participating child was gifted with a savings bank account with LKR 500.00 deposited in it. Efficient water i.e. drip irrigation and soil conservation methods introduced for home gardens enables beneficiaries to face the challenges of climate change and sustain livelihoods with minimal pressure on forest resources. Further community participation in forest conservation is undertaken through the two CBOs the project established and supported by vigilante groups in the two locations. Thirty indigenous women were trained in value addition of traditional crafts such as Kirindi seed – Coixlacryma jobi ornaments, and Rush & Reed products. 12 beneficiaries were trained in organic paddy farming to cultivate traditional rice varieties. Two plant nurseries were established at Henanigala and Dambana. These will be managed by beneficiaries who were given training on aspects of planting. They will ensure a continuous supply of saplings to sustain and expand the nurseries. A food stall was opened in Dambana village to serve traditional cooked foods to be operated by six women with others selling home garden produce, rice and other items.

Impact and sustainability

Government agencies' open support to the new livelihoods introduced by the project augurs well for their sustainability. The Divisional secretariat of Dehiaththakanndiya, Ampara District co-financed the Rush and Reed production by providing raw materials for the training. The "Hadabima" authority of the Department of Agriculture officially agreed to buy organic rice from the farmers

Vedda chief wearing one of the earrings developed by the beneficiaries

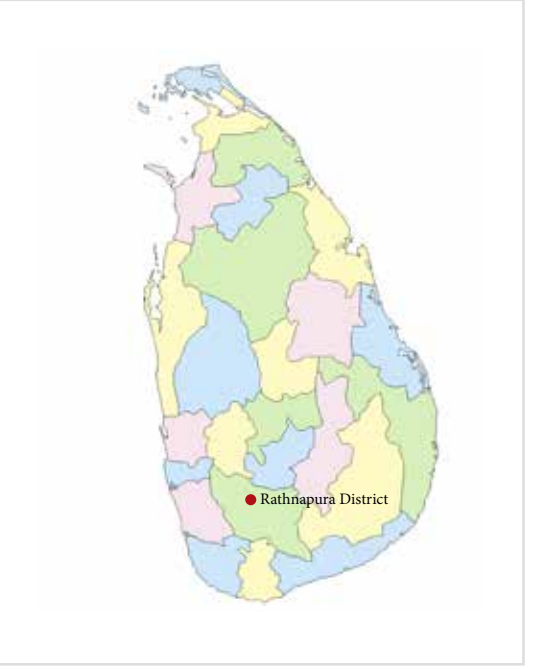
Distribution of saplings for the two plant nurseries

at of LKR 140/kg.The food stall opened in the Dambana village to sell traditional food items benefits around 100 families and created several job opportunities for the indigenous women. This food stall was destroyed due to an unexpected event and is currently being re-established with the support of the grantee and the CBO. The two CBOs will ensure continuity of the home gardening activities, operation of the food stall and other initiatives undertaken by the project. A website developed to capture the culture, traditions, knowledge and beliefs of the Sri Lankan Vedda community is ready for launching. This will create a platform to retain and share information and appreciate the Indigenous People of Sri Lanka.

Lessons Learnt

Working with indigenous communities requires a great degree of tact and flexibility to develop mutual understanding, acceptance and trust. Such flexibility also helps to overcome unforeseen change of events such as the loss of the food stall. Active and continuous involvement of the technical advisor and monitoring by the funder was required for mediation at times of setbacks and complex negotiations. Project activities and the implementation process changed several times under the joint monitoring of the technical expertise of CBR+ and the funder to ensure more flexibility in accommodating the requests of the Vedda community while fulfilling the requirements of the REDD+ concept. Despite the delays caused, the constant revisions and the enthusiasm of the grantee and the community provided the pathway for moving forward for effective implementation of the project.

Addressing the Problem of Cattle Grazing in Udawalawe National Park



Project title:	Participatory community protection actions to conserve the West border of Udawalawe National Park and Bambaragala Mukalana Forest, Rathnapura District
Project Number:	SRL/CBR+/ 2015/04
Focal Area:	Community Based REDD+ (CBR+)
Duration:	18 Months (2015 – 2016)
Implementing organization:	Ekabadda Praja Kantha Maha Sanwardana Sangamaya (EPKMSS)
Address:	Weligepola, Balangoda
Contact No:	+94 77 152 8581
Email Address:	wwdf.1996@gmail.com
GEF/SGP funding:	USD 50,000.00 / LKR 6, 700,000.00

Establishing blocks of CO3* grass for pasture

Introduction and project objectives

Forests are threatened by anthropogenic and natural phenomena such as agricultural expansion, livestock ranching, logging both illegal and legal, industrial expansion, greenhouse gas emissions, and overpopulation. Among the twenty six national parks in Sri Lanka, the Udawalawe National Park has the highest density of the Asian Elephant, Elephus maximus. Yet the food availability, especially the lush grass that grows in the park and relished by the elephant, is subjected to intense competition due to the large numbers of cattle being illegally released to the park from the nearby villages.

The destruction caused by the cattle is not limited to reduced food availability; it has other implications such as rapid increase in the spread of invasive flora and parasite load. In addition to cattle entry, villagers who enter the park to fetch their cattle, engage in poaching, collecting fire wood and non-timber products like bees honey, medicinal plants and resins. In this project, Ekabadda Praja Kantha Maha Sanwardana Sangamaya , Weligepola attempted to minimize deforestation and conserve a stretch of 20 km of the West border of Udawalawe National Park and adjoining Bambaragala Mukalana Forest, mobilizing and empowering communities in 8 border villages in Weligepola DSD Ratnapura district.

* CO-3 is a high yielding perennial fodder grass introduced to Sri Lanka in 1999. This grass is placed in a higher category, especially on tillering capacity, green forage yield, regeneration capacity, leaf to stem ratio, crude protein content, in resistance of pest and diseases and in free from adverse factors along with other fodder varieties grown in the country. It recorded an average green fodder of 5 – 8 kg/plant/cut or 250 -350 t/ha/yr under local conditions. Under this situation, nearly a block of 500 grass bushes is adequate to supply year-round quality fodder without concentrates for two milking cows.

The project addresses one of the main identified drivers of deforestation in Sri Lanka, which is cattle grazing inside protected areas. The main objective of this project is to minimize the cattle grazing inside Udawalawe National Park by establishing pasture areas with hybrid grass varieties (CO3 grass *) within the village to feed the cattle released from the park.

Activities and Achievements

In addition to awareness creation and enhancing knowledge on drivers of forest destruction, the project facilitated the establishment of five CBOs and an Environmental Task Force consisting of 20 community leaders representing the eight villages. Members of the Environmental Task Force were trained in legal aspects of forest conservation and conflict resolutions.

Project activities to minimize cattle grazing and other forest destruction activities by villagers, were implemented mainly through women. Twenty households were supported to establish sustainable dairy farming units. The project supported to purchase 20 high milk-yielding varieties of cattle and build cattle sheds. Twenty home pasture lands were established by planting with a hybrid CO3 grass variety containing high levels of nutrient that helps to increase the yield of cow milk. Veterinary training provided to 35 beneficiaries allowed them to identify common diseases and provide basic health care to cattle. In compliance with the REDD+ concept of reducing Carbon emissions, the project provided fuel efficient stoves to 75 households. The project also established 2.3 hectares of a model agro forest plantation with fruit trees and a large well for continuous supply of water.

Impact and Sustainability

The pastures grown within the village and the introduction of dairy farming have reduced illegal releasing of the cattle into the national park. 180 cattle that were earlier released into the park are now kept within home premises. Through awareness raising and replacing the existing cattle with good breeds of high dairy productivity, the community became aware of benefits of dairy farming. The average household income which was LKR 13, 000.00 before the project has increased by LKR 10,350.00 per month through project activities. An agreement was made with the beneficiaries who received good breed cows to donate first born calves to other beneficiaries. Newly acquired knowledge on animal health care further sustained their interest in cattle farming. The sustainability of such project activities are monitored by the established CBOs.

The introduction of 75 fuel efficient stoves has reduced the average fuel-wood consumption of households by 80% and has reduced the cooking time by 1/3

Conducting base line survey

Constructed sustainable dairy farm units

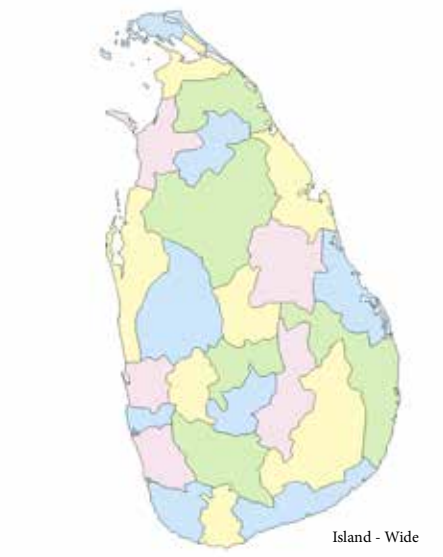
Transplanting fruit trees

to the great satisfaction of the female beneficiaries. Such immediate benefits have had a catalytic effect in promoting this concept among other members of the community. The proposed 0.8 ha model forest plantation which was later extended to 2.3 ha. is maintained by the members of the six CBOs. 60% of the plants originally planted have survived in this plot; the large well provides water to animals and nourishes the water table, with visibly observable effects of increased water level in wells in the peripheral area.

Lessons Learnt

Mobilizing communities living adjacent to forests into conservation activities is challenging due to their low income and limited exposure to development. Such initiatives need to win trust and confidence of communities through implementation of mutually acceptable activities, transparency in action, commitment, tangible benefits and continued support and corporation of relevant stakeholders.

Community Networking and Building Synergy for the Protection of Forests



Project title:	Establishment of a CSO forest monitoring system, Islandwide
Project Number:	SRL/CBR+/2015/08
Focal Area:	Community Based REDD+ (CBR+)
Duration:	18 Months (2015 – 2016)
Implementing organization:	Centre for Environmental Justice (CEJ)
Address:	20A, Kuruppu Road, Colombo 08
Contact No:	+94 112683282
Email Address:	info@ejustice.lk
GEF/SGP funding:	USD 45,000.00 / LKR 5,900,000

Introduction and Objectives

Sri Lanka has a considerably high percentage of protected areas for a given country. These are managed by the Sri Lankan Forest Department or the Department of Wildlife Conservation. Regardless of the attempts for protection, forests are degraded and destroyed at an unprecedented rate qualitatively and quantitatively, resulting in a drastic decline of biodiversity and ecosystem services that is not substantially regulated. Community participation at grassroots level is crucial in the battle to safeguard biodiversity resources.

Indigenous communities and people who live in the forest peripheries can contribute to the conservation process through vigilance and also minimizing their forest dependent activities. Accordingly, this CBR+ project targeted to mobilize forest dependent communities and Civil Society Organizations (CSOs) for better engagement in forest governance & advocacy to assist the CBR+ mechanism in Sri Lanka through awareness development, empowering and networking. The project was built on the understanding that working in isolation will reduce impacts of conservation measures and the contribution to decision making, and for mulating a strong network of people who can interdepend on each other to create conservation forefronts is a necessity. The project aimed to provide communities and CSOs that work with forest dependent communities an informative understanding of the REDD and CBR+ mechanism and of the benefits of forest conservation, thereby maximizing their involvement in forest protection.

Distribution of saplings of native species for forest restoration

Activities and Achievements

The project operated island wide, engaged local communities and 50 CSO partners through workshops, informal meetings, discussions and thematic events. A web based forest crime monitoring and a reporting mechanism (hotline) were launched as an initiative for the CSOs to report crimes, prioritize locations for conservation andengage in conservation measures. Vavuniya in North Central, Ampara in Eastern and Puttalam in North Western Provinces are some of the high priority areas identified by the web reporting. A network was formed of 23 selected forest vigilant groups to take action against drivers of deforestation identified under the study conducted by the UN-REDD Sri Lanka project. Most importantly, the members for the forest vigilant groups were recruited from other CBR+ projects. A hotline was initiated to facilitate people to report forest crimes and a filtering mechanism was established to validate reporting prior to taking legal action, with CEJ as a mediator.

Impact and Sustainability

The project created a channel for the flow of information from the local communities who have firsthand experience on forest destruction events to the decision makers and practitioners. Earlier much of this information either did not reach the decision makers or was lost in the communication process. The introduced system of reporting forest crimes is user friendly and led to a significant increase in the frequency in crime reporting. For example, reported

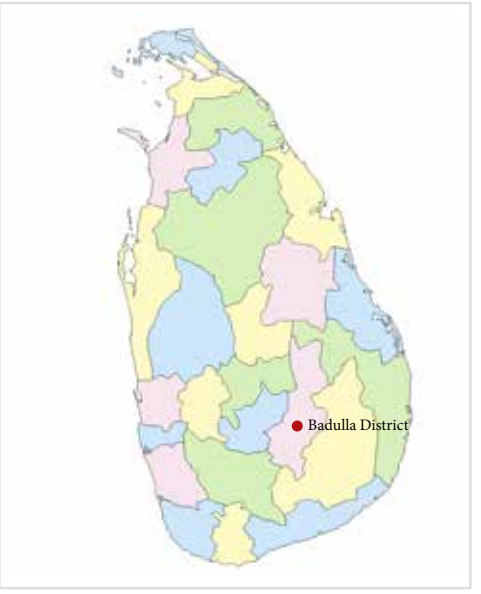
Evidence of forest destruction observed throughout the island

crimes in the period between 2004 -2015 is recorded as 100, where as with the introduction of the new system 175 forest crimes have been reported from 2015 up to date. Enthusiasm of the vigilant groups to continue monitoring has enhanced the sustainability of the activities, while laying a base for the identified communities to continue to contribute towards REDD+ goals. The project also strengthened the networking of CSOs through facilitating involvement in each other's conservation related activities.

Lessons Learnt

Communities living adjoining the forests can play a significant role in forest protection if they are given a suitable platform and due recognition. Vigilante committees are more active where Forest officers played a role in forming them. The vigilante committees formed with economic benefits such as a revolving fund or with access to non wood forest products are also more active in forest protection. The community networking on forests will result in effective and cumulative national level outcomes for the upcoming phase of REDD program in Sri Lanka.

Conservation of Kadapalla Forest Reserve through Community Participation



Project title:	Improved management of a Dry Zone forest with community engagement, Badulla District
Project Number:	SRL/CBR+/2015/03
Focal Area:	Community Bases REDD+ (CBR+)
Duration:	18 months (2015-2016)
Implementing organization:	Future in Our Hands Development Fund -Badulla
Address:	No 325/ A/ 3, Kanupalla, Badulla.
Contact No:	+055 2230 072
Email Address:	Futureinourhands.sl@gmail.com
GEF/SGP funding:	US$ 40,000.00 / LKR 5,350,400.00

Introduction and Objectives

Kadapalla with an extent of approximately 1100 hectares is a dry zone forest located in the Mahiyanganaya and Rideemaliyedda DS Divisions in Badulla district. This forest is a mixture of wet mixed evergreen and Savannah forests with high biodiversity. It can also be considered as the main watershed area of the Maduru Oya (river). Encroachments by village communities living adjacent to the forest and by outsiders for chena cultivation to cultivate maize or Indian Corn for commercial purposes is the main reason for the degradation and deforestation. Forest fires too are frequently disturbing the natural regeneration. Most of the abandoned chena lands have been invaded by invasive alien species such as lantana and Guinea grass. Other factors such as felling trees for timber and fuel wood, exploitation of the forest for non-timber forest products have contributed to the degradation of the forest over the years. The overall goal of this project was to analyze the root causes for the degradation of the forest and take measures to conserve the forest with the participation of communities living close to the forest.

Activities and Achievements

The project addressed forest degradation and deforestation issues adopting a participatory approach with the aim of contributing to the conservation of the forest reserve. The 7.5 km length of forest boundary was demarcated with the assistance of the Forest Department and the community. A fire belt of 7.5 km in length and with a 10 meter width was established to discontinue the spreading of wild fires. Nine thousand and eight hundred fire resistant Agave (Hana) plants were planted within the fire belt to maximize effect as a belt to keep fires out and to prevent other plants from taking over the space. Seventy one model home gardens were established as an income generating activity. Fifteen plant varieties were distributed to those developing home gardens. Hundred and ten families were made aware of the importance of soil conservation and water management and organic farming in home gardens through training which included mulching, composting, bio-fencing and pot irrigation. Ten runoff rainwater harvesting tanks were constructed to collect the rainwater for agriculture purposes based on the requirements. The bund of the village tank was renovated to store water with the aim of distributing for to 18 farmer families who depend on the tank for cultivation during the dry season.

Impact and Sustainability

The above mentioned project interventions have been able to reduce forest fires within the 800 ha forest extent. Also the encroachment by the adjacent villagers

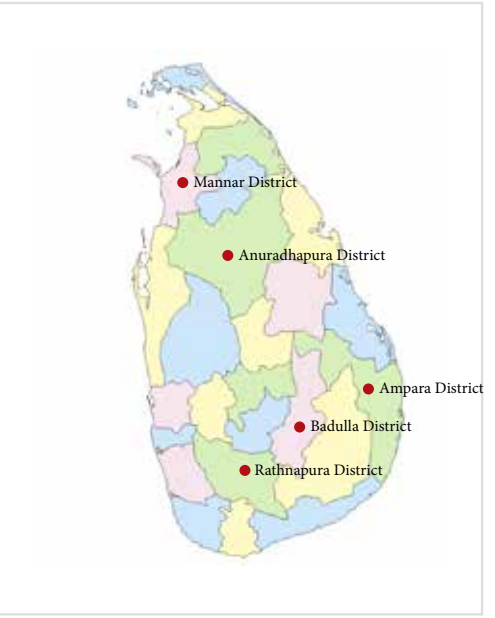
Model home gardens; A model home forest

has been reduced to zero percent during the project period. The income of 100 families has increased by 50 % by converting their land in to systematic forest home gardens with mixed cropping. The project promoted linking with relevant ongoing projects of government and other institutions working in the area to support the sustainability of the interventions. Special attention was given to sensitize, educate and convince the village youth on the urgent need to stop forest degradation and deforestation, as a way of ensuring the sustainability. The Forest Department was a key stakeholder of the project and the necessary steps have been taken to handover the respective project initiatives such as the management of the fire belt and forest boundary demarcation to the department.

Lessons Learnt

A project of this nature i.e. on forest conservation with community participation needs follow up through a number of years to achieve the expected results. Hence the time period of less than two years is insufficient to achieve significant results. Community mobilization is also a process that needs a longer time to win confidence of the community and build trust so that the project can be placed firmly in their hands, leading to sustainability of activities. Since the project was limited to 18 months, the time allocated for mobilization and for planning of cultivations i.e. crops/plants suitable for the two seasons was insufficient, especially with the long drought that intervened during this period. The financial and non-financial benefits of agroforestry have to be clearly communicated to the community in order to motivate them and to link them up with relevant government and other institutions to get the necessary advice and assistance which was possible only marginally during the stipulated period.

Managing Knowledge and Communication to Minimize Deforestation and Forest Degradation



Project title: Knowledge management, networking and capacity building through support to the monitoring and evaluation process of community based REDD projects, Multiple District

Project Number: TERN SRL/CBR+/2015/01 Janathakshan Gte Ltd SRL/CBR+/2015/02

Focal Area: Knowledge management and capacity building

Duration: 18 Months (2015 – 2016)

Implementing organization: Tropical Ecosystem Research Network (TERN) and Janathakshan Gte Ltd.

Address: No. 30/C, Nirodha, Dampe Road,Piliyandala Sri Lanka/ No 05, Lionel Edirisinghe Mawatha, Colombo 05, Sri Lanka

Email Address: ternlanka@gmail.com / info@janathakshan.lk

GEF/SGP funding: USD 50,000.00 / LKR 6,513,500.00

Meeting beneficiaries at the project sites

Introduction and Objectives

Community-Based REDD+ (CBR+), was established in recognition of the strong role local communities and indigenous people play in sustaining and utilizing forest resources. CBR+ projects are implemented on the ground involving communities living in or near the forests, who rely on the natural resources for making a living. CBR+ was designed to empower such communities including indigenous peoples to engage in the implementation of projects that address deforestation and forest degradation and to develop experiences, and lessons at the ground level, that can feed into the national REDD+ process. UNREDD+ strategies and plans are developed at the national level, by national governments of each partner country. CBR+ Sri Lanka programme awarded eight projects of 18 months duration covering Uva, North Central, Eastern, Northern provinces of the country and one project was granted under the theme of Knowledge Management and Capacity Building (KM & CB) to two grantees. The main objectives of the Knowledge Management and Capacity Building Projects were to support the implementation and facilitation of the 8 GEF-SGP funded CBR+ projects to ensure the achievement of desired results and impacts and enable mainstreaming and replication of implemented best practices through gathering, compiling and sharing knowledge.

Activities and Achievements

The two knowledge management teams interacted with the eight grantees and their beneficiaries from the planning to evaluation stages. The grantees were supported in conceptualizing and reformulating the project concepts, revising the logical frameworks and developing activity indicators as required, with the assistance of the national expertise assigned by the CBR + programme.

GIS training to the project beneficiaries at Kadapalla

Three day workshop for revising the logical frameworks of the projects and developing activity indicators

Exhibition at the Sabaragamuwa University

At individual project level, assistance was provided to build capacities of the implementing NGO partners and community capacities in each site through training and awareness programmes, linking them with human, physical and institutional resources, resolving conflicts among beneficiaries, partners and stakeholders. For an example one of the CBR+ project which was lagging due to the poor management capabilities of the grantee could be restored with the active engagement of the community with the assistance and involvement of the knowledge management team. The progress of projects was reviewed and observed through frequent visits and at progress review meetings such as midterm and final project reviews. Guidance for project implementation was provided as required, such as in conducting baseline surveys (i.e. Preparation of the baseline questionnaire and assisting data collection for the project baseline survey conducted by "Ekabadda Praja Kantha Maha Sanwardana Sangamaya, Weligepola" and developing communication and knowledge material required for sharing experiences. The KM teams assisted the GEF-SGP project implementation by developing KM products such as photo stories, case documentation and giving publicity to the initiatives through the media. One introductory photo story was developed and 11 cases were documented

Facilitating knowledge sharing events and participating at project activities

to share the lessons and experiences. 3 videos, 1 manual and 1 booklet were developed and social media was extensively used to share the lessons. Two Radio programmes were broadcasted via Uva community radio to share the project experiences to the public. The introductory photo story developed by the KM teams was intended to acquaint all stakeholders of the implemented projects including international platforms of GEF-SGP.

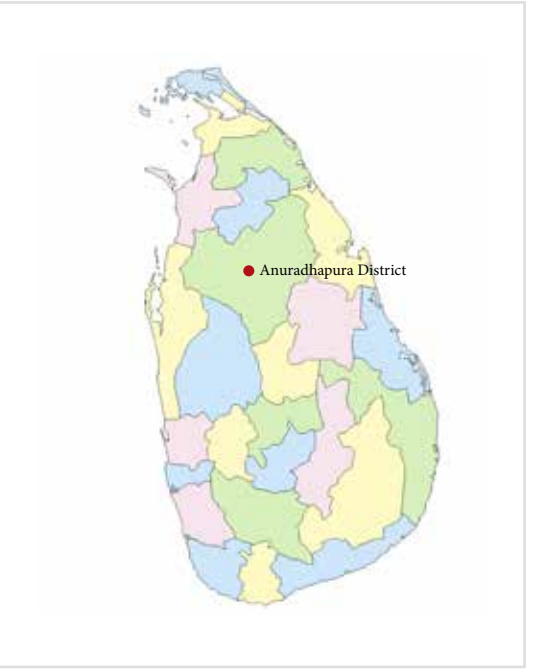
Impact and Sustainability

Some projects which were lagging due to poor management capacity of the grantee could be moved towards expected targets with the inputs of the knowledge management and capacity building team. Through building both technical and non technical capacities such as leadership and management skills, changing attitudes and developing knowledge of project beneficiaries as well as grantees the project assisted and contributed to ensure the sustainability of the community based REDD projects in Sri Lanka.

Lessons Learnt

The capacity of grantees varied. Some grantees required close and extensive assistance while some managed well with general guidance in project implementation. Assessment of the capacity of the grantees at the early stage of the project is therefore essential with more assistance, and capacity building undertaken for grantees with less capabilities. Having assessed the capacity, it is important to clearly identify, clarify, document and agree on the role of the knowledge management and capacity building team and plan out the specific activities. Internal communication and close interactions between the knowledge management teams and grantees is important to win the trust of the grantees which will help to intervene and assist the grantees to implement Projects effectively and efficiently. Identification and planning out of knowledge outputs in collaboration with each grantee and knowledge management team in advance is more effective in delivering quality knowledge outputs.

Addressing drivers of deforestation and forest degradation through legal aid and awareness



Project title:	Reducing drivers of deforestation and degradation through awareness of forest law and legal aid to forest dependent and indigenous communities, Anuradhapura District
Project Number:	SRL/CBR+/2015/09
Focal Area:	Community Based REDD+ (CBR+)
Duration:	18 Months (2015-2016)
Implementing organization:	Public Interest Law Foundation (PILF)
Address:	120/10, Vidya Mawatha, Colombo 07
Contact No:	011 268 2465
Email Address:	86pilf@gmail.com
GEF/SGP funding:	US$ 49 994.00/ LKR 6,849,178. 00

Blue Magpie at the Sinharaja World Heritage Site

Introduction and project objectives

The project established a legal aid and advisory service to assist forest dependent communities to seek legal and administrative relief on forest and wildlife issues. The service is primarily for the Anuradhapura District whilst several urgent issues in other districts are also accommodated. As a first preference, PILF sought administrative relief and negotiated solutions from government departments and other stakeholders forest and wildlife issues. Court action was only taken as a last resort. The project also sought to create awareness amongst communities and lawyers on Forest and Wildlife laws, Environmental Impact Assessments (EIAs) and Community Based REDD+ Sri Lanka programme.

Activities and Achievements

Twenty two lawyers and 101 community members from the District of Anuradhapura have been made aware of Forest and Wildlife laws. Communities were made aware of the legal aid service available to them 24/7 to report forest related grievances and offences during the project period. 123 complaints have been received up to date. Of these most number of complaints were directed to the DWC, FD and other relevant agencies to notify them and for necessary action. Throughout the project period the two departments were contacted by telephone to follow up on important matters and to ask for relief. Communities are continuing to use the 24/7 Complaints Desk at PILF to date.

Two Court cases were filed in the Court of Appeal, one to protect the Sinharaja World Heritage Site from negative impacts of a mini hydropower plant and the other to protect Medawewa in Seeppukulama village, Mihintale from encroachments. Both cases can have a positive bearing in similar situations in the country. The case on Sinharaja was filed considering (i) its importance as the last viable area of primary tropical rainforests which is high in biodiversity with endemic species of


An ancient tank System


Community participation

fauna and flora; (ii) the media exposure carried out on the large scale destruction of the Sinharaja forest by the mini hydropower project; (iii) the international and national level concerns for its conservation as a World Heritage Site and a National Heritage and Wilderness Area and, (iv) to address community concerns.

In addition, the legal aid service was meant to be extended outside the Anuradhapura District on important forest related issues, and the Sinharaja was an urgent issue. The Seeppukulama Medawewa case was filed because of (i) the importance on protecting the ancient tank systems in Sri Lanka and the adjacent forests which is vital for the wellbeing of tanks and, (ii) to fulfill a request made by the people to use the legal aid service available under this project.

Impact and Sustainability

The communities and the other project stakeholders requesting for more programmes on environmental law and forest governance and expressing their willingness to help on forest related problems in Anuradhapura shows the growing demand and the impact of the activity. It was clear that communities appreciated the availability of the legal aid and advisory service. It filled a long felt need of the communities and gave them access to a channel for complaints on illegal forest activities, without compromising their safety, on a 24/7 basis illustrating there is a pressing need for such a mechanism which can be used for forest protection. The project was able to challenge the construction of a mini hydro plant highlighting the loopholes in the existing legislation and legal reform is expected through the filing of the case. It will take a time for the court decision to come. The case is given below for more details.

The Sinharaja Case

PILF learnt that a 600 Kw mini hydropower plant was being built on the boundary of the Sinharaja World Heritage Site at the Koskulana River in the Kalawana Divisional Secretariat Area in the District of Ratnapura of the Sabaragamuwa Province causing adverse impacts on Sinharaja World Heritage site and the river itself.

The Central Environmental Authority (CEA) had approved the project on the submission of an Initial Environmental Examination report (IEE). The position taken by PILF when filing the case was that the irreversible adverse impacts of the project on Sinharaja, is best carried out through an Environmental Impact Assessment (EIA) and not through IEE. EIA is a more in depth study than an IEE. Further, The National Environmental Act No.47 of 1980 as amended allows public participation in the decision making process of EIAs. But this right is not available under IEEs.

During investigations, it was observed that the Forest Department (FD) under whose control the Sinharaja lies had initially objected to the implementation of the project. However, subsequently the FD sent a letter of no objection without giving any reasons for this decision. Additionally, the IEE report submitted to the CEA had passed the deadline given for submission in the Terms of Reference. Also, the CEA had granted approval for the project within one day after submitting the IEE report.

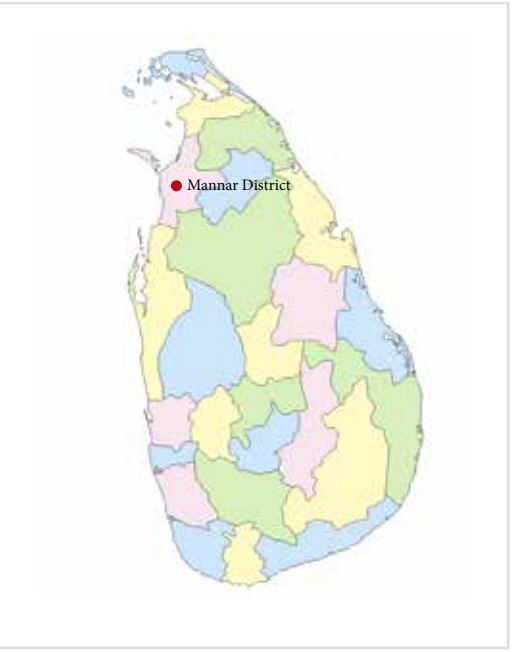
Another issue taken up by PILF was that the alienation of State land for the mini hydro project by the Divisional Secretary was done in violation of the State Lands Ordinance. PILF filed a Writ Application No.527/2015 in the Court of Appeal of Sri Lanka on 23rd December 2015 challenging the approval process of this project. Presently, the matter is pending in Court and project activities including constructions have been stopped based on an undertaking given to Court by the developer.

Lessons Learnt

The many requests for further legal awareness training by communities as well as lawyers show that they require this knowledge for their daily living. The communities especially realized the importance of protecting the forests as they gained knowledge on Forest and Wildlife Laws and EIAs. Both groups are willing to cooperate in forest and wildlife protection.

Withstanding pressures against public participation in environmental matters is an important factor to be considered when communities and NGOs play a role in law enforcement. There is a tendency for law breakers to discourage community and NGO involvement in law enforcement. They resort to various means such as filing SLAPP (Strategic Litigation against Public Participation) suits. During the implementation of this project PILF faced a similar situation when a SLAPP suit was filed against its field officer during a fact finding mission on a forest related complaint.

Advocacy for Strengthening Community Based Forest Conservation



Project title:	Advocacy for Strengthening Community Basd Forest Conservation for resettled communities in Madu Road Sanctuary, Mannar District
Project Number:	SRL/CBR+/2015/07
Focal Area:	Community Based REDD+(CBR+)
Duration:	18 Months (2015-2016)
Implementing organization:	National Forum of Climate Change (NFCC)
Address:	380/7, Sarana rd, Baudhdhaloka rd, Colombo 07.
Contact No:	+94 71 349 6971
Email Address:	nfccsl@gmail.com
GEF/SGP funding:	US$ 50,000: LKR 6,660,000

Tree planting activities were carried out with the support of all the stakeholder parties

Introduction and Objectives

The project's geographical focus is the peripheral forest area of the Madu Road Sanctuary and the forest reserve, in Mannar District, Northern Province of Sri Lanka. It is an area emerging from a three decade long conflict. In recent years the sanctuary was subjected to heavy deforestation and destructive practices of earth and sand mining in large tracts inside the forest. The project targeted 400 households in two resettled villages - Pumalandan I and II that suffer from water scarcity and poverty. The resettled land extent of the two villages is 300 ha of cleared forest area. The resettled communities have little knowledge on forest conservation and sustainable utilization of forest resources. The objectives of the project were to develop a community forest conservation network, create awareness on forest laws, empower communities to support the implementation of REDD+ concepts while building livelihoods and means of income generation.

Activities and Achievements

In the face of lack of opportunities, the community depended on the forest for earning an income through illegal logging and sand mining. According to the Forest Department, a significant destruction to the forest reserve is being made by the resettled communities in this specific area. The project launched a forest restoration initiative planting 5000 saplings initially, designed an advocacy tool kit

Gathering of a local advisory committee representing the government and non-governmental officials of the area

for conservation, established three community youth vigilante groups as forests guardians and built REDD+ awareness among students of 28 selected schools. Twenty two agro wells with an average depth of 2.5m were built to assist farmers to obtain water for agriculture. Selected women beneficiaries were trained in beekeeping, producing compost and making value added products such as herbal balms, shampoos to increase their income.

Impact and Sustainability

Twelve CBOs consisting of 30 villagers each (both men and women) were established in Pumalandan I and II, to engage the local community in environmental conservation activities. They were encouraged to take part in the local/national level initiatives and dialogues on forest protection. Further, a local advisory committee representing the government and non-governmental officials of the area i.e. Wildlife and Forest Department officials, the Police, Grama Sevaka, Military and priests, was established to facilitate the effective contribution of the stakeholders in project activities. These committee members ensured community contribution to the project, provided assistance in awareness programmes conducted for the beneficiaries. The project in collaboration with the Forest Department helped to demarcate 20km boundary of the Periyamadu area of the Madu Road Sanctuary based on a request made by the DFO Mannar as a much needed protection measure. A main activity of the project was to plant 10,000 trees in the degraded areas. 5000 saplings were planted with the rains during the first three months. Thereafter the area has undergone a severe drought which has continued in the past 14 months. The survival rate of saplings initially planted is less than 25%. As a mitigatory

Notice boards that contains messages on forest conservation were put up along the roadside of the Madu Sanctuary

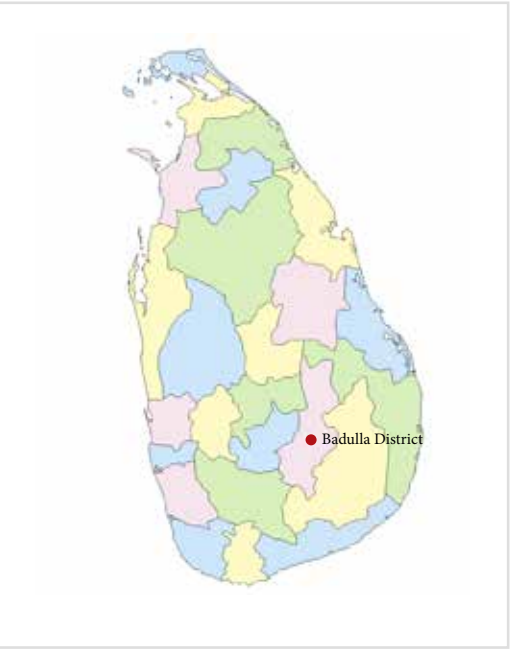
Construction of compost bins

measure, 300 households have been distributed with five saplings each and 28 schools have been provided with 10 saplings per school to be planted and cared for. The project tries to ensure the sustainability of activities through the continued commitment of the community and by addressing livelihood and income generation concerns including market access for products developed through the project.

Lessons Learnt

It is necessary to clearly identify the physical, social and geographical characteristics of the project location, and the constrains for proposed activities at the preliminary stage of the project. This will help to propose alternatives and take necessary precautions based on the magnitude of potential risks. This necessity was evident from the initial resistance of the community to engage in the project, which consumed considerable time and effort. Further the water scarcity affected the core activity of planting and maintaining 10,000 saplings due to the prolonged drought that lasted nearly 14 months. Drought conditions in Mannar district are worsening currently indicating the importance of designing ecological conservation projects with knowledge and foresight.

A Community Driven Approach to Combat Deforestation and Forest Degradation



Project title:	Combat Deforestation and Forest Degradation by minimizing forest fires, Badulla District
Project Number:	SRL/CBR+/2015/06
Focal Area:	Community Based REDD+(CBR+)
Duration:	18 Months (2015-2016)
Implementing organization:	Baduludena Death Donation Society (BDDS) and Ilukpelessa Community Development Organization(ICDO)-Funding channeled through Sabaragamu Community Development Foundation (SCDF)
Address:	BDDS - Uva Kosgama, Haldummulla / ICDO – Ilukpelessa, Kalthota, Balangoda
Contact No:	BDDS – 0726743528 / ICDO – 071 724 4450
GEF/SGP funding:	US$ 35 215.00/ LKR 5,330,550. 00

Home gardening

Introduction and Objectives

Haputale Forest Range in Badulla forest division is under heavy threat of degradation due to human activities. Forest fires are frequently reported as villagers set fire to dead grass during the dry spells before the onset of monsoon rains to get young grass shoots for their cattle. Most of the villagers own cattle in the two villages. The fires destroy acres of natural forest and disturb natural regeneration. The villagers also collect Non Timber Forest Products (NTFP) to supplement their income. Over exploitation of NWFPs has also led to forest degradation.

The project was initiated in 2015 with the objective of conserving the Kosgama forest in the Haputale forest range by taking measures to minimize community led drivers of deforestation with the active engagement of of 85 beneficiary families in the two villages.

Activities and Achievements

The project activities were delayed at the initial stage due to mismanagement by the grantee. After multiple visits and discussions the activities were revised, finalized and a decision taken to handover the management of the project to the two communities through the existing CBOs. The leadership in managing the activities, the decision making, finance management and implementing project activities were thereafter, the responsibility of the two CBOs. The activity

Construction of agro wells

implementation was closely followed by the knowledge management team giving advice through site visits and discussions.

The project raised awareness on the causes and effects of deforestation and forest degradation and attempted drive the mindset and the behaviors of the villagers towards sustainable consumption and forest conservation, through awareness campaigns, street drama, exchange visits, art competition for school kids. 85 model home gardens were established in the two villages. Around 2000 Orange, Pomagranate, Nelli, Cashew, Mango trees were distributed for planting. A fire belt of 2 km length was established in Baduludena and the activity was replicated in Ilukpelessa. A reforestation programme was carried out in Baduludena and 1000 plants i.e. Mee, Pihimbiya, Kumbuk were replanted in a degraded forest land. The adaptability of cultivated grasses was experimented to minimize setting of fire to obtain fresh grasses. The project also facilitated improvement of village infrastructure with the aim of boosting existing livelihoods, for example agro wells (Ilukpelessa 2, Baduludena 1) were constructed, to fulfill agricultural water requirements during the dry season. Equipment for land tilling in home gardens were distributed among the 85 beneficiary families. Construction of the existing anicut in Baduludena is planned with the corporation of relevant government departments. Training in

home gardening, production of "Kithul" treacle, leadership and management were undertaken. The CBO leaders were trained in book keeping and accounts management. Community engagement was promoted in all activities, ensuring in particular the involvement of women and children in the decision making process.

Impact and Sustainability

The community has become more knowledgeable and sensitive on forest conservation issues. With the measures taken, the percentage of forest fires has been reduced to 70 – 80 percent. Due to the training received the importance of maintaining an effective home garden as a source of earning an income and for food security has been recognized and the community is highly motivated towards converting their unproductive lands into efficient home gardens. Of the 85 home gardens, twenty are developed as model home gardens. The project initiatives will be continued by the two community based organizations that represent the two villages and joint assets will be managed by the societies.

Lessons Learnt

The project execution process generated many lessons, the main lesson being that the grant approving process has to be fervently focused on ensuring that funding reaches the communities for intended activities. This will also ensure minimizing waste of time and energy of stakeholders in correcting bad practices. Secondly, it proved that communities are proficient in taking over leadership and raising their voices against injustice. Thirdly, that active participation and leadership of the community, irrespective of gender and age can mitigate negative impacts and place activities on the right path. Further, building community capacity is essential in managing project activities and close monitoring and follow up has to be ensured as support to communities who feel marginalized.

The process also demonstrated that community mobilization and empowerment was a vital need and that planning, allocating sufficient time to obtain active and effective participation throughout and minimizing conflicts are important factors. Changing livelihood patterns of a forest dependent community is a highly challenging undertaking requiring in-depth socio economic analysis in planning suitable alternative livelihoods. Improving home gardens is one option in supplementing household income, but requires a long term plan with sound technical assistance in cultivation, maintenance and marketing to achieve expected benefits.

Part II

Conserving & Protecting: Sharing Experiences

Selected Global Environment Facility-Small Grants Programme
OP V funded Projects in Sri Lanka

Introduction

The selected case studies included in this book of GEF/SGP initiatives, provide a snapshot of projects implemented in the Operational Phase V period of 2010 - 2014. The GEF Small Grants Programme Sri Lanka was launched as a pilot initiative in 1995. During the five subsequent GEF operational phases (1997-2015), the Sri Lanka programme has funded over 378 community led initiatives, with a primary aim of supporting the achievement of global environmental benefits and the protection of the global environment through community led local solutions that work in harmony with national and global action.

Over a 20-year period the Sri Lanka Country Programme has built extensive portfolios in the GEF thematic areas, testing and adapting a variety of approaches in project implementation with community-based organizations of different capacity levels. It has supported initiatives in biodiversity conservation, in particular agro biodiversity, prevention or mitigation of land degradation, climate change mitigation and adaptation, air quality improvement, promotion of renewable energies and energy efficiency and minimizing the use of chemicals as some of the main support areas. Continuous capacity building, including awareness and knowledge dissemination among communities were undertaken. To ensure community buy-in and project sustainability, livelihood development activities formed part of all initiatives. As the programme matured, emphasis was placed on ensuring measurable results and impacts, needing close project monitoring and guidance. Capacity building, technical guidance and knowledge management were obligatory to achieve measurable results and called for the involvement of institutions with the required skills in guiding grantees. The capacity building and knowledge management initiatives started in OP IV and emphasized in OP V has improved project monitoring, enhanced linkages among stakeholders and facilitated bringing technical expertise from a variety of institutions such as universities, the private and government sectors.

The priorities and direction of the country programme are determined primarily by the National Steering Committee (NSC) whose expertise is essential to achieve results. In selecting grantee projects, the NSC determines their fit with the GEF focal areas in order to ensure global environmental benefits are generated while sustaining local level development paybacks such as enhanced incomes, food security and the sustainability of initiatives.

Another important aim of the programme has been to develop successful models for replication and scaling up through sharing experiences and promoting wider involvement of multiple stakeholder organizations. Lessons learned over time, has been useful for newer initiatives for better success and in scaling up to achieve economic, social and ecological sustainability.

However, experience shows that community-based organizations still often labor under significant difficulties, including underdeveloped strategic visions, weak planning and organizational skills, lack of adaptive management capabilities, limited capacities for sustained and systematic innovation, and ineffective linkages with other organizations to come together for collective action. This shows the need for continued support and hand holding of community organizations if they are to achieve goals set out in national and global agenda.

In this publication an attempt has been made to illustrate selected initiatives that have adopted a community based approach towards conservation and protection and those that have achieved considerable success at the national level with impacts at the global level. For instance, in the area of biodiversity conservation communities have come forward to safeguard forests or mangroves as ecosystems essential for their well being and as a resource base for their livelihoods. The willingness of communities to protect and conserve when given the right knowledge and awareness, is demonstrated in the initiatives of providing refuge to injured animals or conserving wetlands for local and migrant bird species. Enterprise development through species conservation such as through yam and tuber cultivations, bamboo crafts, converting tea small holder plots to organic tea with hand made tea production are examples of sustainable use of biodiversity and its long term protection. Conserving traditional knowledge is shown in the initiative where a motivated Buddhist Monk embarks on preserving ancient Ola leaf manuscripts and training young monks in the art.

In climate change adaptation, the initiatives implemented have gained the appreciation of communities, who are increasingly burdened by climate variations and extreme events which have affected livelihoods so adversely that they are reduced to poverty and helplessness. Lack of water for cultivation for marginalized communities, extended dry seasons, salt water intrusion, lack of infrastructure to channel water are areas activities have been implemented to address concerns.

The adoption of renewable sources of energy and efficient use of energy for day to day living as well as for livelihood enhancement is demonstrated in projects that use biogas digesters for recycling effluence or domestic waste or the use of agro waste in ovens for drying food products such as fish. Both male and female community members have been enthusiastic users of energy efficient devices. Sustainable transport initiatives in an urban setting illustrate the willingness, yet the constraints faced by communities. The growing electronic waste in highly urbanized settings need management and the undertaking by a youth group shows promise of success.

Initiatives that work with communities living in degraded hill slopes have demonstrated ways to achieve productivity of land with appropriate land management techniques.

In the scaling up of initiatives, SGP partners have formed wider linkages, with the government and the private sector nationally as well as internationally as illustrated by the three initiatives on marine turtle and pelican conservation and in minimizing the use of persistent organic pollutants.

The book also includes relevant features of GEF Full Size Projects being implemented in Sri Lanka, in the three write ups on Invasive Alien Species, resilience to climate change through tank rehabilitation and promoting bamboo cultivation in Sri Lanka.

The book therefore is not merely a presentation of initiatives undertaken by SGP but an illustration of lessons learnt in implementing challenging projects and successes that can be achieved when communities are equipped with the necessary capacities, awareness and knowledge and are motivated to safeguard and protect eco systems, manage the land they cultivate, embrace renewable energy methods, minimize and manage the use of chemicals et al, in implementing GEF focal area projects.

COMMUNITIES AND CLIMATE CHANGE

Rehabilitation of Yalpotha Tank for People and for Wildlife to Combat Climate Change

Project title:	Rehabilitation of Yalpotha Tank and canals, Ampara District
Project Number:	SRL/SGP/OP5/STAR/CC/2014/02
Focal Area:	Climate Change
Duration:	One year (2014-2015)
Implementing organization:	Nature Conservation Foundation (NCF)
Address:	Pothuwil road, Waralanda, Lahugala
Contact No:	+94 77 329 3773
E mail:	mtnaturecoy.12@gmail.com
GEF/SGP funding:	USD 34,971.00/ LKR 4, 570,730.00

Participatory renovation of the tank bund

Introduction and Objectives

Water is a scarce resource in the dry zone. Lack of water can adversely impact agriculture, mainly paddy cultivation which is the life blood of rural agricultural communities, livestock and wildlife. Sri Lanka has the world's highest density of man-made tanks and reservoirs, most of them in the dry zone. Although these tanks in good condition can store water for agriculture and other uses, most are abandoned or degraded due to encroachment, siltation, pollution and neglect.

The Bogaslanda (Pansalgoda) village of the Lahugala DS division with a population of 410 is located on the border of the Lahugala national park. The agricultural community in this village has suffered from terrorism, poverty, severe water scarcity and human elephant conflict. The project implemented by the Nature Conservation Foundation (NCF) seeks to address some of the major problems faced by the community due to water scarcity. Main objectives of this project were to increase availability of water through tank renovation, minimize human elephant conflict by altering the path taken by the elephants and raise community awareness on the effects of climate change. Reduction

Before and after condition of the renovated canals that supply water to paddy fields

A thick cover of "Beru" grass –a delicacy of the elephants, emerged after the tank renovation.

A micro financing scheme was established under the guidance of a former successful GEF-SG Pgrantee, Ms.Renuka Bhadrakanthi

of harmful anthropogenic practices on biodiversity, community livelihood enhancement and building resilience against climate change were the other key objectives.

Activities and Achievements

The key activity of rehabilitating the degraded Yalpotha tank i.e. reconstruction of the tank bund, the channels and tank spill was undertaken as a climate change adaptive strategy to address the issue of water scarcity and to minimize human elephant conflict by increasing availability of water to wildlife. Women in 61 households were trained and supported to adopt organic home gardening to reduce harmful practices and plant trees in home gardens as a climate change adaptive measure. In order to foster resilience against climate change, women were trained and supported to establish a CBO and operate a micro credit scheme, with an initial capital of Rs. 200,000 from the project.

Impacts and sustainability

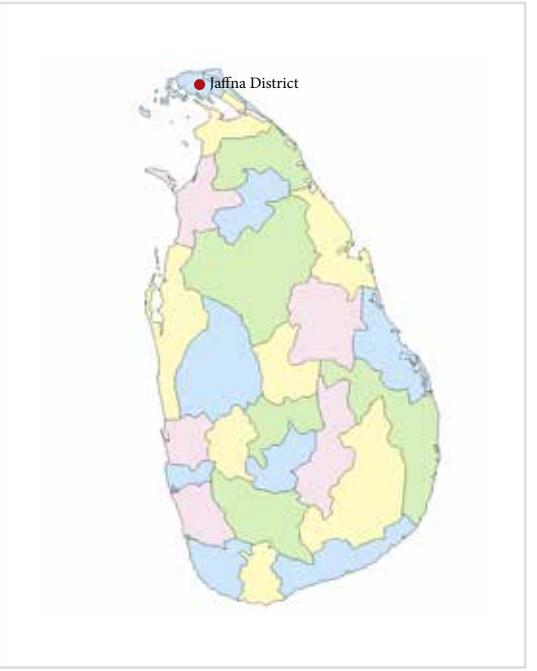
Since the renovation of the tank bund, the Yalpotha tank is operating at its full water retention capacity of 400 ac. to ft² or 493,392 m^3. Rehabilitation of the

tank has enabled farmers to engage in paddy cultivation in both Yala and Maha seasons and also to extend the land area used for paddy cultivation. The 89 hectares currently under paddy cultivation is three-times (60.7 hectares) more than the land under paddy cultivation prior to the rehabilitation of the tank. It has also increased seasonal job opportunities for community members who work in paddy fields as paid labourers. Some community members have been able to use the knowledge gained during trainings to advance home gardening into a viable source of income which will encourage them to continue engaging in eco friendly farming methods and other conservation activities. These positive outcomes have elevated the average household income from LKR 27950.00 to LKR 41860.00 per cultivation season (three months). The involvement of the Department of Agriculture and the farmer organization of the village in water resource partitioning will sustain the two seasons per year cultivation pattern and associated economic benefits. The project has been successful in establishing adaptive strategies to the changing weather patterns while boosting climate change resilience of a lacustrine ecosystem. Habitat restoration and improved food supplies for livestock and wildlife has enhanced the biodiversity around the tank e.g. with cattle, elephants, small mammals, waterfowls, amphibians, reptiles and butterflies benefiting and in home gardens. Regeneration of the tank's vegetation dominated by 'Beru' or cup scale grass, a preferable diet of the Elephants following the tank rehabilitation has especially benefitted the herds of Elephant traversing the Lahugala National Park and peripheral areas. Villagers' report of relatively less human-elephant encounters compared to the past.

Lessons Learnt

Environmental, economic sustainability and overall feasibility of activities such as home gardening have to carefully considered at an early stage before letting rural communities who are likely to be affected by both droughts and excess of water during rains, invest in ventures which are 'seasonal' and of doubtful success. Post-project monitoring of activities and/or institutes established under the Project such as the Women's Miro-credit scheme is important in order to maintain and extend benefits from such activities.

Building resilience to Climate Change



Project Title:	Ecosystem improvement and adaptation to climate change through promotion of home gardens in Maravanapulo, Jaffna district
Project Number:	SRL/SGP/OP5/STAR/CC/2014/22
Focal area:	Climate Change
Duration:	4 months (2014-2016)
Implementing Organization:	Maravanpulo Thirumagal Thrift and Credit Cooperation Society
Address:	Maravanpulo Junction, Karativu
Contact info:	+94 71682 0667
Email:	rajig2012@yahoo.com
GEF/SGP funding:	USD 25,344.00 / LKR 4, 113,000.00

The drinking water well restored under the project

Introduction and Objectives

Maravanpulo is a resettled village in Jaffna with a population of 130. The civil war that lasted nearly three decades from 1983 to 2009 severely affected Maravanapulo, resulting in casualties, displaced families, setbacks in economic development and environmental damage. The village falls within the driest parts of the Jaffna peninsula and it is also one of the largest rain-fed paddy cultivating areas in the district. Salt water intrusion affects almost all the wells in the area and the community suffers from lack of good quality water, impeding their day to day life.

Climate change can bring about widespread effects such as increased temperatures, uneven and/or delayed rainfall and increased occurrences of droughts and floods. Climate change has the greatest impact on communities that are most reliant on natural resources for their livelihoods and have the least capacity to respond to natural hazards such as droughts. Low income groups, especially women, face higher risks and bear greater burdens from the impacts of climate change. The Maravanpulo Thirumagal Credit and Thrift Cooperation Society embarked on this project to provide Maravanpulo villagers, mainly women, with access to good quality water and economic empowerment to build resilience against climate change.

Activities and Achievements

Increased access to potable water and empowerment of the women members of the Maravanpulo Thrift and Credit Society were the main objectives of the project. Key activities implemented to increase availability of water

Water scarcity affects the day to day life of Maravanpulo community

A beneficiary with her mushroom harvest

included rehabilitation (renovation and deepening) of an abandoned well and promotion of rain water harvesting. Fifty five female members in two hamlets of the Maravanpulo village were selected under the project to promote organic home gardening adapting techniques such as composting of household waste, organic pesticide preparation and propagation of traditional vegetable varieties. Mushroom cultivation and bee keeping were also introduced as alternative sources of income. Awareness meetings, workshops and trainings were conducted to expose the beneficiary women to organic farming, biodiversity conservation, pesticide hazards, compost preparation, mushroom cultivation and bee keeping.

Impacts and Sustainability

The rehabilitation of the abandoned well has increased the availability of good quality drinking water to 20 families in the village. For the others, rainwater harvesting units were introduced to 20 households and three members are provided with dugout ponds with plastic lining in their cultivation plots for rainwater collection. More rainwater harvesting tanks are to be distributed by the DS Division for the rest of the members. Hence, water is now provided for domestic use as well as for cultivation during the dry season for all the members. Exposure to efficient use of water for home gardening in drought conditions (e.g. sprinklers, drip irrigation) and tree planting to increase vegetation cover will contribute to water conservation, improving the ecosystem and livelihoods of community to build resilience against climate change.

The diversity in vegetable crops in home gardens increased by 21% during the project period and a biodiversity survey carried out by the University of Jaffna has shown a 22% increase in biodiversity in the area between 2014 and 2016.

Rain water harvesting systems established by the project

Introduced drought resistant home garden cultivation techniques

Forty five beneficiaries received loans through micro-financing schemes to engage in livestock, mushroom cultivation and agriculture. Household income and expenditure records maintained by the women beneficiaries show that the average annual income per household has increased from LKR 192,625 in 2013 (pre- project) to LKR 324,570 in 2016.

Through their engagement in various awareness programs, trainings, organic home gardening activities and operating a micro-financing scheme, the women have gained knowledge, self-confidence, leadership skills, and independent decision-making skills to continuously improve their livelihoods and successfully meet the challenges of climate change.

A small library established in the village for children has improved the reading habit including that of mothers who come with the children. It has also improved knowledge sharing, dissemination as well as raising awareness on critical issues related to sustainable agriculture, biodiversity, climate change among others.

Lessons Learnt

Timely guidance and expertise is necessary to introduce concepts such as organic farming, traditional vegetable cultivation, seed collection and water conservation to communities with no previous exposure to such initiatives, more so as they were internally displaced persons who had little opportunity to develop knowledge on cultivation or conservation during the extended period of the conflict. This project and its implementation process can be used as a model to promote organic agriculture and water conservation techniques in other areas with similarly deteriorated landscapes.

Increasing Resilience to Climate Change through Rainwater Harvesting

Project title:	Empowering Dry Zone Small Scale Farmers to Use Traditional Water Conservation Methods to Improve Resistance to Droughts, Monaragala District
Project number:	SRL/SGP/OP5/STAR/CC/2015/04
Focal area:	Climate Change
Duration:	2015 - 2017
Implementing organization:	Mihimaw Science Foundation
Address:	Mihimaw Science Foundation, No. 10 T, Horathuduwa Watamawatha, Polgasovita
Contact Number:	+94 112704846/ +94 718021838
GEF/SGP funding:	USD 24,596/ LKR 3,290,000

Beneficiary in her organic home garden

Introduction and Objectives

Katuwewa is a village located in Sewanagala division of Monaragala district. Udawalawe and Lahugala National Parks are located 20-30 km away from this village and as a result, the Asiatic elephant (Elephas maximus) frequent Katuwewa. The majority of the community members ware vegetable farmers cultivating land areas ranging from ¼ to 2 acres. Paddy cultivation is done on small plots during the "Maha" season (September to March) when water is available.

Only a few farmers have access to irrigated water from the Udawalawe reservoir. Non-availability of water hinders the community from cultivating crops throughout the year. To overcome this, the villagers constructed a small tank in 1993 but its capacity was insufficient to meet the demands of the farmers.

The main objective of the project was to assist the farming community to increase resilience to climate change and be better equipped to face droughts through storing rain water in traditional ponds and practice improved water management practices. The activities implemented included the construction of 16 traditional rainwater ponds within farm plots, the rehabilitation of the existing village tank, establishing soil and water conservation practices in 50 farm gardens, introducing native crop species that are adapted to drought conditions and providing training to 40 members on micro-finance management.

Various types of organic fertilizers

Activities and Achievements

16 small rainwater ponds were constructed within home gardens of selected beneficiaries. The total water retention capacity of these ponds was 556,487 cubic feet and the individual pond capacity varied between 12,000 and 84,000 cubic feet. The retained pond water was utilized for cultivating both paddy and other crops.

The carrying capacity of the village tank was increased from 4 acre feet to 22 acre feet. The tank bed was excavated, the tank bund was filled and the spillway was constructed. The bund was turfed to avoid surface run off of water. The community provided labour for construction activities while technical assistance was obtained from the Divisional Secretariat. The cultivation area utilizing the tank water increased from 15 to over 42 acres.

Training was provided on organic farming, soil conservation measures, cultivating drought resistant crop varieties, making products for sale such as herbal shampoo and medicinal products, as well as improving family food security and micro financing. Micro-credit ventures were introduced to female members. Drought resistant seeds including three traditional rice varieties, 'Kotabaru, Heenati and Kuruluthuda', vegetables and fruit trees were distributed with successful harvesting of produce.

The Sewanagala Divisional Secretariat allocated a land area of 5 acres to the project for a model farm. An organic model farming training centre is being established on the premises. A total of 35 families has benefitted directly from this project

Rainwater pond during a drought season

Impact and Sustainability

Rainwater harvesting in ponds and the village tank improved water security in small agricultural farms of this dry zone village as the stored water helped re-charge groundwater sources. The increase in water sources assisted the community to improve their livelihood conditions significantly and become more resilient to adverse effects of climate change.

Good water management practices at household and community levels, especially careful use of tank water ensures the sustainability of the project.

The organic model farm provides a means for the beneficiaries to work and earn a livelihood. The training school will continue to provide various trainings on organic farming and alternative livelihood options.

Lessons Learnt

Introducing new livelihood options are essential for a community to overcome the poverty trap and adapt to the effects of climate change.

Continuous dialogue and awareness building of beneficiaries led to better understanding of problems, better solutions and active participation.

Incentives such as prizes for best home gardens kept the community motivated during the drier periods of the year.

Cooperation extended by government officials and the village headman was vital in project implementation.

Promotion of Biogas to Mitigate and Adapt to Climate Change.

Project title:	Assess the effectiveness of biogas digesters installed so far and present efficient standards for biogas plants, Islandwide
Project Number:	SRL/SGP/OP5/STAR/CC/2013/03
Focal Area:	Climate change
Duration:	months: 41 Months 2013-2017
Implementing organization:	Human and Environmental Links Progressive Organization (HELPO)
Location:	Island wide
Address:	No.364/18A, Samagi Mawatha, Dangedara, Galle
Contact No:	+94 91 4380121
GEF/SGP funding:	US$ 39,460/ LKR 5,524,400.00

Bio gas Plant established at the Naval Camp in Kalpitiya

Introduction and Objectives

Biogas technology is considered one of the best solutions to manage waste, minimize methane emissions, reduce fuel wood demand and reduce forest degradation. However, there is no advanced analytical method to measure the level of GHG emission reduction in biogas technology in Sri Lanka. Human and Environmental Links Progressive Organization (HELPO) initiated this project to compile a biogas user registry of plants installed in Sri Lanka, their efficiency, measure the methane reduction of a biogas unit using organic waste, identify the most effective standard models of biogas plants in use and introduce an innovative model with quality parameters.

Activities and Achievements

A technical committee was appointed for a comprehensive analysis of the existing biogas plant network and to identify standards for biogas digesters. A survey of existing biogas plants was undertaken through a combination of stratified and random sampling by a university team. Data was collected from 132 existing biogas digesters. The survey report outlines drawbacks in design, operation and maintenance and best practices.

The measurement of emission reduction was done using purchased gas flow meters with additional accessories fabricated at the university laboratory including sulfur filters to prevent corrosion of the meters from sulfur products. To achieve the objective of introducing an innovative model three biogas

Awareness programem for Navy officers

digesters were constructed, the most effective one being the one at the Navy Camp Rapid Action Boat Squadron Headquarters at Kalpitiya with a capacity of 35 m3 capable of providing solutions for toilet water overflow and waste disposal. Secondly a model of a biogas digester which can be used especially in an urban setting with limited space, was designed. The low cost portable pre-cast PVC anaerobic biogas digester for domestic users with a capacity that ranges from 5 – 6 m^3, which can be operated with kitchen waste and septic tank waste of a typical family is to be introduced with expert recommendations.

Impact and Sustainability

The NGO has trained a team with technical capacity to expand the work and cater to demands of new biogas users. They were trained according to the new quality parameters while fulfilling the need of environment friendly ways to manage waste contributing to local and global requirements. The study also generated data on methane emissions in other sectors such as paddy fields for comparison in future analyses. The newly designed portable model when introduced will popularize biogas as a renewable energy source among a wider public as it has the advantages of being cost effective i.e. cheap to manufacture, easy to operate and maintain, small in size but with efficient capacity and requiring minimum space/land in urban gardens and able to manage wet waste generated by the household.

University Students conducting the survey

Waste water from the bio gas plant in Kalpitiya released to a pond

Lessons Learnt

The survey revealed that 81% of the digesters used kitchen waste as the main feeding material and the main application of the gas was for cooking, some for lighting and power generation. The users noted that the benefits were saving money by using biogas as a fuel for cooking and a solution to waste disposal, minimizing pests and using the slurry as a bio-fertilizer for organic farming and gaining an extra income by selling the bio fertilizer.

The most recurrent problems were corrosion from sulfur dioxide and other sulfur products, especially of cookers reducing the life of cookers (22%), intensive odor, non-availability of sulfur filters (22.2%), blockages of inlet and outlet pipes frequently, due to using pipes with small diameters and bends (11%). Formation of a crust on the surface of the slurry inside the digester reducing the biogas production (6.3%) was another problem. The possible reason being lack of water fed into the digester with other feeding material which also could be overcome by having a proper mixing mechanism inside the digester. 17.5% of the plants were not in working order. 48.8% of the digesters generate biogas rich in methane content.

Bio fertilizer (slurry) collected at the outlet tank was rich in Nitrogen (N), Phosphorous (P) and Potassium (K). However due to lack of awareness 41.3% do not use bio fertilizer for any purpose.

In spite of the above problems, 82.5% were positive and expressed satisfaction in using biogas.

Enhancing Transportation and Energy Consumption Practices in the City of Colombo

Project title:	Reducing greenhouse gas (GHG) emissions by promoting and awareness raising on Environ mentally Sustainable Transport and Sustainable Energy Systems, Colombo District
Project Number:	SRL/SGP/OP5/STAR/CC/2014/31
Focal Area:	Climate Change
Duration:	18 months (2015-2016)
Implementing organization:	Clean Air Sri Lanka
Address:	1183/B, Rajamalwatte Road, Battaramulla
Contact No:	+94 11 286 9902
Email:	scasllanka@gmail.com
GEF/SGP funding:	USD 50,000.00/ LKR 6,533,000.00

Awareness programme for school children

Introduction and Objectives

The energy sector of Sri Lanka is heavily dependent on imported petroleum oils and coal, which are main contributors to atmospheric pollution and greenhouse gas emissions. The statistics on fuel consumption in 2016 states that an amount 8.41 Mt of CO_2 is emitted to the environment by the transport sector annually. The projection of emissions published in Sri Lanka's second national communication on Climate change (MENR 2012) states that this amount will increase up to 11.4 Mt of CO_2 by 2020. Clean Air 2000 Action Plan was established in early 2000 to restore the deteriorating air quality in the Colombo Metropolitan Area under the Metropolitan Environmental Improvement Programme (MEIP).

To promote sustainable energy concepts in the first phase of the above plan, a project was implemented under GEF-SGP with the following objectives; to promote low cost non-motorized transport systems in the urban areas of the Colombo district with strong multi- stakeholder participation and to promote sustainable energy concepts such as energy efficiency improvements, energy conservation and management in household, commercial, transport and industrial establishments, including guidance for green buildings, particularly through awareness and education.

Activities and Achievements

The project identified school children as an important stakeholder for awareness building. A booklet on air pollution and related issues such as adverse health effects, environmental impacts of air pollution and control regulations adopted in Sri Lanka was prepared for school children studying in grades 7 - 11.

Conducting perception surveys on NMT

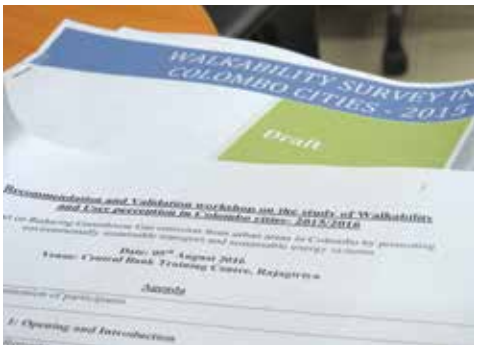
Awareness programmes were conducted for school children, teachers and parents in schools in Kotte and Battaramulla areas on air pollution, fuel quality and vehicular/industrial emissions, benefits of Non-Motorized Transport (NMT), energy management and related issues. The household energy use of these students was audited before and three months after the awareness programmes and data was gathered on energy consumption practices to evaluate the effectiveness of the awareness programmes. 3000 leaflets and 5000 stickers were distributed among general public of Colombo to introduce NMT, while promoting its importance on reducing GHG emissions.

A random sample of people (2,727) selected from three municipal councils, namely Colombo, Sri Jayawardhanapura-Kotte and Kaduwela were interviewed on the satisfaction of the availability and the quality of pedestrian facilities. Another survey was conducted in a similar method to evaluate the perception of the public on establishing and developing NMT and available infrastructure in the Western Province. The data gathered on vehicle ownership, travel behaviour, purpose of trips, perception of NMT Infrastructure facilities, fuel consumption of Hybrid vehicles, pedestrian and cyclist fatalities, exposure to air pollution and the preference on NMT Infrastructure facilities and socio-economic profile was compiled in two studies that was validated by eight governmental and nongovernmental persons during a workshop. The survey on evaluation of hybrid and electric motor cars and three wheeler fleets was carried out to estimate their potential contribution to the reduction of air pollution, especially greenhouse gases.

Impact and Sustainability

The awareness programmes for school children has oriented them to maintain a distance from motorcycles and other vehicles with visibly heavy emissions. The information gathered through NMT survey was made available to respective local

Increasing the awareness of the school students on air pollution, NMT and related issues



Two study reports compiled from the data gathered

Multi-stakeholder validation workshop to finalize the gathered data

authorities to improve walkability, cycling and use of other non-motorized modes of transportation. The perception survey regarding the infrastructure facilities for walkability made recommendations to meet the objective of reducing greenhouse gases. Findings of the surveys will provide necessary evidence for the local authorities, to provide facilities and infrastructure for NMT and to increase the number of non-motorised vehicle users. It may also create a marginal increase in the walking population.

Lessons Learnt

Awareness programs for school children, and studies of this nature should be compatible with their school calendar to get time free for such non-curricular programs. The process of household data compilation by school children is most effective, gives hands-on experience and compatible with the project objectives.

SAFEGUARDING BIODIVERSITY & EMPOWERING COMMUNITIES THROUGH PARTICIPATORY ECOSYSTEM CONSERVATION

A Refuge for the Wet Zone Wildlife

Project title:	Establishment of a wet zone wildlife refuge in Bellanwila-Attidiya Wetland Sanctuary, Colombo District
Project Number:	SRL/SGP/OP5/STAR/BD/2014/29
Focal Area:	Biodiversity
Duration:	20 months (2014- 2016)
Implementing organization:	Organization for Aquatic Resource Management (OARM)
Address:	9/5, Nagahamulla Rd, Kolonnawa
Contact No:	+94 717547677
Email:	oarmsl@gmail.com
GEF/SGP Funding:	US$ 47,562.00/LKR 6,283,000.00

Feeding a baby purple-faced Leaf Monkey

Introduction and Objectives

The Bellanwila-Attidiya sanctuary is located amidst the densely populated suburbs of the south-eastern outskirts of Colombo. Its extent of 372 hectares has been subjected to many encroachments and illegal land fillings over the years. The rapid urbanization and the accelerated population growth has been responsible in drastically reducing this important wetland to less than half its original extent. The wetland falls into lowland wet zone climatic zone, which is renowned for its rich biological wealth. However, at present its biodiversity is fast disappearing and the highly fragmented area is becoming further degraded each year. Research studies have indicated that these fragmented habitats contain a diversity of fauna including several globally threatened and endemic species. For example, the western purple-faced langur or Kalu Vandura, a subspecies of purple-faced langur endemic to Sri Lanka, critically endangered globally, is found here. Other important species include the fishing cat, barking deer, hog deer, mongoose, civet cats, pythons and a large number of bird species.

Many of these animals are faced with threats especially from road accidents and electrocution, while the young get separated from their parents and are lost. Due to lack of facilities in the wetland, the practice was to translocate most of the injured or orphaned animals to dry zone wildlife health centers which are

An injured Indian Fishing cat

totally alien habitats to the wet zone animals. As an initial step to resolve this problem, the Department of Wildlife Conservation (DWC) erected a wildlife holding area within the eastern border of the Bellanwilla-Attidiya Sanctuary.

Activities and Achievements

The project supported this initiative and expanded services in providing a refuge to injured and abandoned wildlife.

The NGO - Organization for Aquatic Resources Management (OARM) in collaboration with the Department of Wildlife Conservation were successful in providing facilities such as office space, equipment and accommodation to the veterinary surgeons and volunteer staff as well as holding facilities for the animals.

Five enclosures for injured ungulates, five cages for monkeys and eagles and eight cages for snakes were installed. Office space for the staff was provided by refurbishing a container box, while a building was constructed to provide accommodation to the veterinary surgeons. The repairs to the boundary fence of the 5 acre property was completed.

The renovated and upgraded facility started taking in injured animals from October 2015. According to the records at the facility, during a ten month period 627 individuals belonging to 58 species have been treated at the facility. Of the treated, 483 were released after full recovery. The highest number of treated species were birds. Among treated the birds, the Greater Coucal or Eti kukula, which is a common home garden bird and the Spot-billed Pelican that frequent

Releasing treated reptiles to the wild

the wetlands were the most injured species. For mammals, Purple-faced Leaf Monkey was the most treated for injuries. Out of the 41 treated 20 monkeys were released after successful treatment. Other animals treated at the facility within this period included 6 Indian Fishing Cats, 6 Pythons, 112 Indian Star Tortoises, 210 Marine Turtles and two Sambar Deer.

Impact and Sustainability

Under the project, long term needs of the western wildlife region of the DWC have been addressed. The site will be sustained as it is managed by the Veterinary Unit of the Wildlife Health Management Division of DWC, comprising a team of 3, headed by the Veterinary Surgeon responsible for the Western Province. Salaries and allowances for veterinary surgeons and volunteers is borne by the DWC as well as expenses for medicines and animal treatment.

As a result of establishing the facility, the recovery rate of animals in the urban wet zone has increased as the treatment can be provided much quicker with the reduction in the response time. As a future activity the opening of the facility for educational and recreational purposes is proposed. The DWC as the responsible government institution will continue the management and maintenance of this facility after the funding is concluded.

Lessons Learnt

Projects of this nature implemented with government collaboration can provide effective results. Awareness raising of communities living adjacent to wetlands or forests on the importance and value of conserving biodiversity is a sustainable solution to its rapid depletion and disappearance.

Citizen Science and Birding for the Protection of Urban Wetlands of Colombo

Project title:	Conservation of Urban Wetlands through Birds and Citizen Science, Colombo District
Project number:	SRL/SGP/OP5/STAR/BD/2015/09
Focal area:	Biodiversity
Duration:	2015 - 2017
Implementing organization:	Field Ornithology Group Sri Lanka (FOGSL)
Address:	Field Ornithology Group of Sri Lanka (FOGSL), Department of Zoology, University of Colombo, Colombo 03
Contact number:	+94 112501332/ +94 112592609
GEF/SGP funding:	USD 24,150/ LKR 3,294,302

Awareness programs conducted for school children

Introduction and Objectives

The Colombo district is endowed with a variety of wetlands that comprise manmade lakes, canals, paddy fields, abandoned paddy lands and marshes. These wetlands provide a number of important ecosystem services such as preventing floods, particularly during heavy monsoons. Provision of food, fuel wood, opportunities for recreation and habitats for aquatic vegetation, functioning as cattle grazing sites are other services provided by the wetlands. Over 250 plant species including 9 endemics, and 280 species of fauna, including over 100 species of birds are present in these urban wetlands. Yet, published information suggests that in some areas of the city, the rate of loss since the 1980s has been as high as 60%. Main threats include reclamation or housing development, water pollution, unplanned release of sewage and solid waste, and the spread of alien invasive species.

Several wetlands and associated environments are designated as "Urban Parks" with the main objectives of controlling the seasonal floods in the city while providing a better environment for the citizens of Colombo, especially for recreational purposes. Preliminary investigations by FOGSL showed that these urban parks attract a large number of local and migrant birds, yet the people who utilized these parks were not aware of the rich biodiversity associated with them.

Birds at the wetland park

The project objectives include creating urban ecological awareness among citizens including school children, initiating monitoring and data collection programs in three selected urban wetlands by employing the citizen science approach and developing ecological sustainability in selected urban wetland systems as models for conserving the biological wealth contained in these parks with the involvement of the general public.

Activities and Achievements

The project activities are ongoing at present and include organizing field trips and awareness programs for popularizing bird watching at the wetlands, providing training, increasing awareness through media, conducting school programs to create awareness on wetland conservation, improving wetland sites by planting native species, establishing site support groups at the wetland sites and developing a web-based information portal.

The project continues to achieve its objectives in creating awareness on urban biodiversity and the importance of protecting wetlands through the enthusiastic participation of the public, especially the younger generations, and the support of various government and private organizations. By establishing links with different stakeholders, especially the relevant government institutions, the project has been able to fill a void in taking the message to the general public about the importance of protecting urban wetlands.

Impact and Sustainability

The project has reached out to many concerned citizens and school children through the implementation of the activities in wetland parks of Beddagana,

Emeritus Professor Sarath Kotagama delivers an inspiring talk on the importance of wetland conservation

Thalawathugoda and Weli Park in Nugegoda. With growing popularity as recreational areas, the three wetland parks have seen an increased number of visitors since the implementation of the project. Bird monitoring by the citizens as well as school children offer valuable information for agencies and organizations working to protect wetlands.

Close collaborations between the grantee and governmental organizations such as the Urban Development Authority (UDA), Sri Lanka Land Reclamation and Development Corporation (SLLRDC) and the Central Environmental Authority (CEA) of Sri Lanka as well as with Non-Government Organizations (NGOs) have been successful in taking the message to the wider public. For example, being part of the management committee in Beddagana Wetland Park provided FOGSL an opportunity to directly influence its management. FOGSL being part of a leading University of Sri Lanka with over 40 years of experience in biodiversity conservation has been a key factor in making this process a success and sustainable.

Lessons Learnt

This project is still in the process of being implemented. However, an important lesson learned so far is that wetlands are dynamic in nature and therefore it is vital to monitor the ecological health of a wetland to maintain the ecosystem services provided by this habitat.

Conservation of Traditional Knowledge: Ola Leaf Writing and its Promotion

Project title:	Conservation of traditional knowledge through conservation of Ola Leaf inscriptions and traditional food practices, Matale District
Project number:	SRL/SGP/OP5/STAR/BD/2014/16
Focal area:	Bio-diversity
Duration:	12 Months (2014-2015)
Implementing organization:	Rangiri Thakshana Piyasa, Maningamuwa Maha Viharaya, Matale
Address:	Maningamuwa Mahaviharaya, Maningamuwa, Pllepola, Matale, Sri Lanka
Contact No.	+94 767061995
GEF/SGP funding:	USD 28615.00/ LKR 3,720,000.00

Traditional skills

Introduction and Objectives

Palm leaves were used as a writing material in South Asia and Southeast Asia dating back to the 5th century BCE. Ola leaf is a palm leaf used for writing in traditional palm leaf manuscripts in Southern India and Sri Lanka. The leaves are from the Talipot palm (*Corypha umbraculifera*). Ola leaf inscriptions have been used through generations in Sri Lanka to preserve and pass on the teachings of the Buddha, astrology, ancestral medicinal prescriptions and the history and culture of the people. Although ola leaf manuscripts represent an important cultural identity of the country, most of these manuscripts have been completely destroyed or stolen. The rest is fast deteriorating due to dampness, insect activity, mold and fragility. Ola leaf writing is a skilled craft requiring patience, practice and training. At present, very few have the skill. Further, as many are unable to decipher what is written on ola leaves, there is a danger of losing a vast store house of traditional knowledge.

The Rangiri Thakshana Piyasa, a CBO managed by the chief monk of the Maningamuwa Temple, Matale district has undertaken the challenge of preserving the traditional ola leaf inscription culture within Matale district. The main objectives of the project was to document traditional knowledge while conserving the environment through training in traditional ola leaf manuscript writing, planting trees to extract material used in the ola leaf writing, improve livelihoods of community through production of handicrafts from the left over palm leaf parts and promote traditional food practices.

Supplying raw materials

Learning by doing

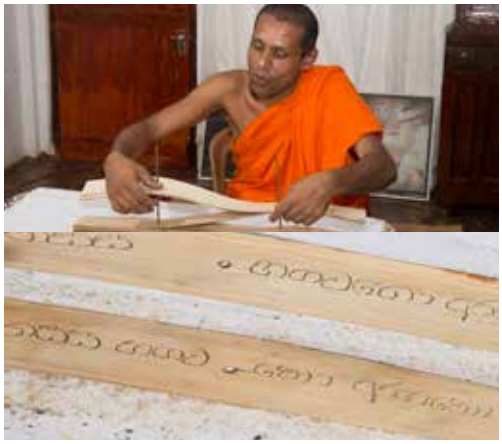
Activities and Achievements

Key activities implemented were collection of unused or neglected Ola leaf manuscripts and related accessories such as metal stylus,(i.e. the tool used for writing) from other temples and households, establishment of an art gallery and training centre for ola leaf writing, translation, Publication of traditional knowledge on indigenous medicine contained in Ola leaf manuscripts and translating from Pali language into Sinhala, training of monks and youth in ola leaf writing, education and awareness for school children on the art of ola leaf writing, were also aimed at Establishing a supply network for production of raw materials through growing plants i.e. talipot, Mee, Kakuna, Bamboo, Pineapple and papaya and, conservation of traditional food technology were undertaken.

Indigenous traditional health care practices contained in 100 Ola leaf manuscripts collected from temples and individuals have been translated and published as a book titled "Sri Lankan medicinal practices written in Ola leaves". 156 student monks and lay people were trained in ola leaf preparation and manuscript writing and 20 persons are now able to produce ola leafs when the demand arise. The ola leaf art gallery and training centre was established at the Maningamuwa temple.

Plant diversity in two hectares of home gardens and one hectare in the temple premises was enhanced through cultivation of over 5000 plants such as talipot, Mee, Kekuna, Bamboo, Pineapple and papaya. Over 30 handicraft products utilizing the left over palm leaf parts are on sale at the Ola leaf art gallery and the Rangiri Craft House.

Application of indigenous knowledge



Transferring traditional knowledge

Impact and Sustainability

The distribution of 2500 copies of the book "Sri Lankan medicinal practices written in Ola leaves" among cultural centres, schools and public libraries in the district contribute to conservation of traditional and indigenous knowledge in medicine. Those trained in ola leaf preparation and manuscript writing attached to temples and organizations, are committed to the conservation and dissemination of the traditional knowledge base. Awareness created in over 1000 school children on ola leaf manuscripts contribute to continued interest on ola leaf writing among future generations. The ola leaf art gallery and training centre ensure sustainability in the dissemination of indigenous knowledge in ola leaf manuscripts and conservation of traditional knowledge. The 100 Ola leaf manuscripts collected from temples and individuals are also on display at this centre.

Handicraft production utilizing the left over palm leaf has created 10 direct and 50 indirect employment opportunities for low income women and the resulting average monthly income of LKR. 8500.00 (US$ 56.60) earned by the beneficiary households exceed the official poverty line of LKR. 4240.00 (US$28.20)for Matale district in 2017, as stated by the Dept. of Census and Statistics. The women's group established by the project is registered, has access to bank credit and participate in trade fairs. Besides making handicrafts, the women are also actively engaged in promoting and popularizing traditional food varieties by participating in food fairs.

Lessons Learnt

A small, localized intervention initiated to preserve traditional knowledge can make an impact at national level, as evidenced by the recent commitment made by the government to conserve the ola leaf manuscripts in temples.

Management & Conservation of a Mangrove Ecosystem

Project title:	Management & Conservation of Mangrove ecosystem of Manthai west coastal Community, Mannar District
Project Number :	SGP/OP5/STAR/BD/2014/31
Focal Area :	Bio-diversity
Duration :	12 Months (2014-2015)
Implementing Organization :	Community Aid Foundation, Lebbe Street, Tharapuram, Mannar, Sri Lanka
Address :	55 Mosque Road, Uppukkulam, Mannar, Sri Lanka
Contact No :	+94 718363905
GEF/SGP funding :	USD 28,742.00/ LKR40,23,880.00

For the future

Introduction and Objectives

Vidathaltivu is a coastal fishing village in Manthai Division, Mannar District, which has a total population of 3683 persons in 936 households prior to the civil conflict, comprising both Tamils and Muslims who engaged mainly in fishing and agriculture. With people migrating out of Vidathaltivu during the conflict, the current population is 1728 persons in 351 households.

Prior to the conflict the coastal environment of the village was rich with large tracts of mangroves, salt marshes, sea grass beds and near shore coral reefs. In the absence of proper management during the conflict and post conflict period, mangroves have been cut down, coral reefs damaged due to use of explosives for fishing and sea grass beds threatened by the use of trawl nets, leading to massive degradation of marine bio-diversity. Degradation of the marine and coastal habitats and resources in Vidathaltivu is seen as the primary cause for the spread of poverty among the war affected communities.

The main objectives of the project were to conserve the coastal and marine habitats including mangroves and coral reefs by enhancing community awareness and education and skills and capacity development for alternative livelihoods.


Diverse environment


Mangrove saplings

Activities and Achievements

Key Project interventions included acquiring baseline information on socio-economic and environmental conditions of the village, education and awareness creation among school children, community members and government officers and awareness among fishers against the use of harmful fishing gear and destructive fishing practices such as dynamiting the reef, production of outreach materials i.e. posters, leaflets, brochures for promoting conservation, mangrove re-plantation, coral reef cleaning, skill development, establishment of a revolving loan fund to support livelihoods and provision of fishing nets as an incentive to dissuade the use of explosives in fishing.

Impacts and Sustainability

The Project has demonstrated a number of options that can be successfully adopted for coastal environment rehabilitation. These include planting of 5000 mangrove seedlings covering a 3 km coastal belt with community participation and conducting a rapid coral reef survey followed by education and awareness programmes supported by Fisheries and Naval officers targeting fishermen against illegal fishing, aided by posters and brochures and reef cleaning conducted over a 2 km stretch of reef with the participation of Naval personnel, fishermen and divers. These activities will show their impact only after a period of time and not in the immediate aftermath, and when such activities are sustained and expanded by the stakeholders concerned.

Similarly, provision of fishing nets to ten fishermen needs to be expanded to cover all fishermen using illegal fishing methods and combine with strict enforcement of regulations to ensure that use of destructive fishing methods are eliminated altogether.

On the economic front, skills development, provision of operational capital through revolving funds and capital goods such as sewing machines provided under the project have enabled beneficiary women to more than double their average monthly income from LKR.8357 (USD 57)to LKR 17,285 (USD 117)

Skills development

Collective effort

For the local market

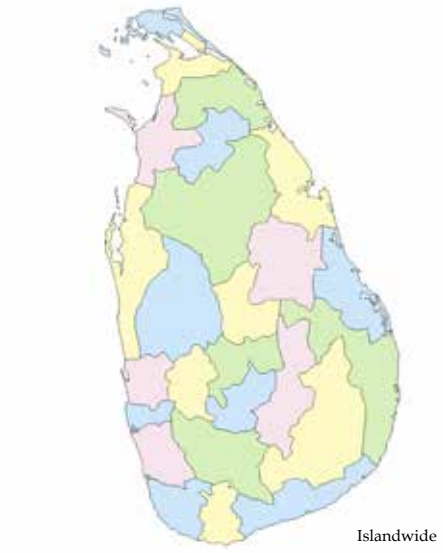
The three revolving loan funds established under the Women Rural Development Societies (WRDS) with an initial capital LKR 50,000.00 (USD 340) have freed the beneficiaries from informal borrowers who generally provide credit at higher interests. The conflict affected women in Vidathaltivu have been empowered under the Women Rural Development Societies (WRDS) to manage the three revolving funds, the skills development programme and have been in the forefront in implementing the project interventions, i.e. planning, implementation and monitoring. They were also involved in mangrove re-plantation.

Project interventions including advocacy and lobbying has contributed to Vidathaltivu coral reef and associated environment, being designated as a Special Management Area (SMA) in the Coast Conservation and Coastal Resources Management Plan of 2016 and the Department of Wildlife Conservation declaring Vidataltivu as a marine sanctuary in 2016.

Lessons Learnt

Considering the scale of anthropogenic stress on the Vidathaltivu coral reef, a coral regenerating programme and an up-scaling of the community surveillance are required to consolidate and ensure sustainability of project interventions for the conservation of marine bio-diversity in the area.

Building Capacities, Sharing Knowledge & Experiences from the GEF-SGP Operational Phase V Projects



Project title: Knowledge Management and Capacity Enhancement of GEF SGP OP V funded projects, Multiple Districts

Focal Area : Capacity Development

Duration : 36 Months (June 2014 – July 2017)

Implementing Organization : Marine and Coastal Resources Conservation Foundation (MCRCF), Tropical Ecosystem Research Network (TERN), Sri Lanka Environment Exploration Society (SLEES) and Center for Youth Organizations (CENYO)

GEF/SGP funding : GEF/SGP funding: US$ 198, 262 / LKR 28, 549, 728

Contact Info: mcrcfkal@gmail.com; sleeslk@gmail.com ; ternlanka@gmail.com ; centerforyouth.sl@gmail.com

Members of the Technical Advisory Group examining a modern smoke house

Introduction and Objectives

The Operational Phase V of the Global Environmental Facility (GEF) Small Grants Programme (SGP) provided grants to 36 Non-Governmental Organizations (NGO's) and Community Based Organizations (CBO's), to address GEF focal area issues such as climate change mitigation and adaptation, conservation of biodiversity, protection of international waters, elimination of Persistent Organic Pollutants and prevention of land degradation. 4 grants were awarded for knowledge management and capacity building of the partners and other stakeholders of the OP V process. Through the implementation of projects, the NGOs and CBOs were expected to play a significant role in addressing GEF global concerns at local level in Sri Lanka. Since 1994, more than 400 such initiatives have been funded by GEF/SGP at the national and local level to demonstrate community level approaches. Similar to the previous phase of OP IV, in OP V too, "knowledge management and capacity building" were identified as vital and essential elements to be emphasized, from project

A group discussion between community members and KM teams

formulation and implementation process to evaluation and documenting lessons. It is an important approach promoted to identify, capture, facilitate and share innovative technologies and lessons learned from SGP interventions. Four organizations, the Marine and Coastal Resources Conservation Foundation (MCRCF), Tropical Ecosystem Research Network (TERN), Sri Lanka Environment Exploration Society (SLEES) and the Center for Youth Organizations (CENYO) were assigned for the KM process in this phase.

Activities and Achievements

The main objectives of the knowledge management programme were to facilitate mainstreaming and replication of GEF-SGP best practices through knowledge production and sharing across a wider platform.

During the situation analysis conducted by the KM groups at the early stage of the projects, the strengths, weaknesses, opportunities and threats pertaining to capacities of the SGP grantees were identified. Based on the findings of the assessments, a collective effort was made by the four KM groups to enhance the capacity of the grantee NGO's and CBO's by providing training and knowledge on monitoring and evaluation with special emphasis on formulating collection of baseline data to enable to monitor the process, outputs and the outcomes of the project interventions, knowledge management and communication strategies; linking projects with environmental laws, policies and conventions, business management planning and market investigations for micro-enterprises

and organizational management and capacity improvement. Furthermore, the KM groups identified the draw backs in the outputs of the individual project interventions through extensive field investigations and review of primary and secondary data and information. Accordingly, technical guidance and relevant training was provided by mobilizing the SGP Technical Advisory Group (TAG) members/experts in respective fields with remedial measures recommended for adoption during implementation.

In compliance with the GEF standards and guidelines, annual results monitoring related to individual projects were conducted and disseminated. In accordance with the results, the KM teams encouraged and assisted the grantees to network, scale-up, enhance partnerships with the private sector, linked and collaborated with government institutions to institutionalize some of the interventions and diversify them to ensure sustainability. For the purpose of sharing, networking and showcasing best practices and innovations of all projects, a dedicated website was setup for information dissemination.

To accord due recognition and share the efforts made by SGP Sri Lanka in addressing global environment issues with the wider community, the KM teams nominated initiatives for international competitions and awards such as the Equator Prize, Asia Environmental Enforcement Award, SEED Award, ISTF (International Society of Tropical Foresters) Innovation Prize, Momentum for Change Awards, Coral Conservation Prize and Green Star Awards. As a result of these efforts, the SGP implemented "Promotion of Bio Gas Technology and Energy Efficient Rubber Drying Houses to reduce GHG emissions in rubber processing" was placed 1st Runner-up at the ISTF (International Society of Tropical Foresters) Innovation Prize organized by the Yale University, USA in 2017. The grantees have also won many national awards during this period such as for bamboo and Kithul (fish tail palm) products.

To measure the changes affected by the Small Grants Programme, KM teams conducted assessments focusing on environmental, social and economic impacts. In addition, the changes affected by the initiatives were documented through multiple modes such as posters, newspaper feature articles, case studies, photo stories, video documentaries and web based sharing platforms such as the GEF-SGP's national website www.gefsgpsl.org. These KM products were disseminated and shared during events such as Environmental Day celebrations, at educational exhibitions and presented at international/national conferences and symposiums.

KM teams also engaged independent partners to conduct technical evaluations to assess the overall relevance, effectiveness, efficiency, impact and sustainability

Actively engaging with the activities organized by the communities

of projects implemented. These independent evaluations captured complex issues, intended and unintended effects at the community level, post-project. The knowledge gathered contributed to the pool of lessons learned from SGP interventions and will enable continuous improvement of approaches in subsequent operational phases.

Impact and Sustainability

The technical guidance provided by the KM teams contributed to minimize some drawbacks during the implementation process and led to positive outcomes. The experience and the knowledge gained by grantees in implementing interventions were shared among all partners through training programmes conducted by the KM teams. The information on best practices, innovations and examples produced by the projects have been disseminated and publicized among the wider community through print and electronic media. The facilitation made by the KM team for the capacity enhancement of the grantees led to impacts reflected at policy level such as in the declaration of conservation areas, special management areas and marine sanctuaries through interventions implemented by the projects. In addition, the business plans and linkages established with the government agencies enabled institutionalization of some of the interventions.

Lessons Learnt

The collective efforts made in capacity enhancement of the SGP initiatives by the KM teams have demonstrated significant success in achieving objectives.. The assessment of outcomes and the impacts of the interventions requires time. Therefore, the knowledge management process needs to be initiated during the latter part of the implementation process while capacity enhancement and technical facilitation should commence at the early stage of the implementation process.

Knowledge management is a participatory process where benefits are far reaching, it can be hard to measure and quantify in accounting terms. For example, it is difficult to quantify the time spent or the cost of finding the right information or reproducing knowledge that already exists. However, in the absence of effective knowledge management, there can be duplication of efforts and activities, inconsistency in the approaches or understanding of the policy impacts; lack of awareness of the challenges, loss of knowledge and insight, insufficient ability to share best practices and innovations, absence of collaborative work or failure to identify loss of time and resources. The purpose of the best practice and knowledge sharing efforts is to enable grantees and other stakeholders to network, share and showcase best practices, innovative technologies and lessons learned to promote the replication and scaling up of results for greater policy influence and transformational change, as well as to promote sustainability and the mobilization of additional resources for community-based sustainable development initiatives.

In view of the above, it is necessary to strengthen capacities on consultative processes and to apply knowledge management to ensure adequate information flows, adherence to convention guidelines, capture results through indicator monitoring and evaluating potential environmental impacts and trends. Knowledge management strategies have to be continually reviewed, adjusted and reformulated in the light of lessons learned from their implementation. Hence, to achieve the desired objectives of the Country Programme and to ensure sustainability of the outcomes of the initiatives being undertaken by the NGOs and CBOs, capacity building and knowledge management is a requirement, adopting multi-faceted methodologies while incorporating adequate monitoring of project implementation.

SUSTAINABLE LIVELIHOOD ALTERNATIVES THROUGH GREEN PRACTICES AND ENHANCING ECOSYSTEM SERVICES

Conservation of Bamboo Species and Promoting Bamboo Crafts

Project title:	Conservation of Bamboo species and promoting bamboo products, Matale District
Project Number:	SRL/SGP/OP5/STAR/LD/2013/07
Focal area:	Land degradation
Duration:	12 Months (2014-2015)
Implementing organization:	Arunalu Community Development Centre, Matale
Address: No:	113/24, 4th Lane Samandawa Road, Aluvihare, Matale, Sri Lanka
Contact No:	+94 714496277
GEF/SGP funding:	USD 44,519.00/ LKR 57,87,500.00

Production process of bamboo crafts

Introduction and Objectives

Intensive sand mining had severely eroded the banks of the Nalanda Oya tributary flowing through villages in the Yatawatta and Pallepola Divisional Secretariat Divisions in Matale district, adversely affecting agriculture, the principal livelihood of villagers. Farmers and those living adjacent to the river failed in many previous attempts to arrest the erosion of the river banks. Arunalu Community Development Centre (ACDC) an organization working in Matale sought a solution to stabilize the banks through measures such as sand bag reinforcement and cultivation of local bamboo varieties. They initiated their work in 2007.

In the present project ACDC aimed to generate economic benefits to the communities through training in bamboo crafts and sale of bamboo-based products. In addition they would continue the work on minimizing erosion of river banks through the cultivation of bamboo and the conservation of local bamboo varieties, to increase biodiversity.

Activities and Achievements

Key activities of the present project included planting of 320 clumps of bamboo belonging to eight local varieties, 6000 clumps of Rambuk (*Saccharum arundinaceum*) and 2500 clumps of Ketala (*Lagenandra ovatas*) along 4 km of the river bank; supplying of bamboo for the construction industry and as a raw

Contribution for the future

Bamboo plantation

Sustainable harvesting

material for crafts and operating a center for bamboo-based products with trained crafters.

95 women from the three villages of Walliwala, Galahitiyagama and Delgolla with no previous employment were trained in bamboo craft and related work. Of these 12 women gained direct employment at the Center and 04 women are home based workers. Women are in the forefront at the centre, in processing, production, quality control and marketing of the bamboo craft, they are also active in maintaining the bamboo plant nursery and river bank stabilization work with their partners.

Impact and Sustainability

Project impacts are varied and significant. Planting of bamboo and other trees along the river banks has contributed to the controlling of 90% of the erosion along a three kilometer stretch of the Nalanda Oya tributary from Delgolla to Salagam, an extent of 4.4 Ha. of riverbanks. Project has demonstrated the use of bamboo as an effective soft solution for preventing soil erosion along river banks, particularly in hilly areas.

The annual supply of about 7500 bamboo poles for the construction industry is reducing pressure on forests for wild hard wood. In addition, bamboo-based consumer items and crafts provide a viable alternative to the environmentally harmful materials.

The women employed at the centre earn an average monthly income of LKR 7500.00 (US$50.00) per person. They now have extra money in hand for household expenses and children's education leading to the upgrading of the family's economic status.

Innovations

Application of skills

Quality assurance

Product diversity

The newly established bamboo craft center serve as a knowledge hub as well as sales outlet. Success achieved under the project is useful in creating to create awareness on the use of bamboo as a soft solution for curbing soil erosion. Training is provided on how bamboo can be used for making utensils, ornaments, toys, and small containers for spices and mementos targeting tourists.

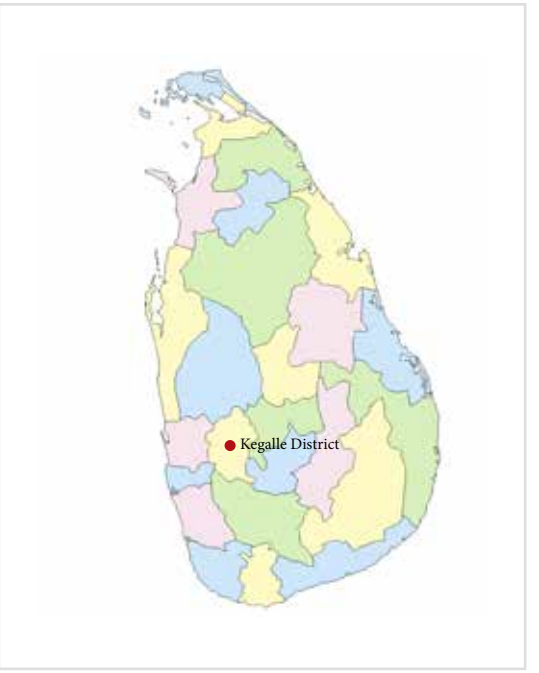
A tea set and a tray produced by this centre won a 2016 Presidential merit award in the field of bamboo/cane craft at "Shilpa Abhimani - 2016" handicraft competition organized by the National Craft Council Sri Lanka.

Lessons Learnt

Awareness on environment conservation and skills development of low income groups can contribute to sustainable livelihoods as well as protect their lands from further degradation.

In craft making continuous training and quality control is critical to enhance the market share for community products.

Increased Income Through Value Addition to Indigenous Yam Varieties



Project Name:	ncreased income through value addition to indigenous yam varieties, Kehalle District
Project No:	SRL/SGP/OP5/STAR/BD/2014/19
Focal area:	Bio-diversity
Duration:	12 Months (2014-2015)
Implementing organization:	Community Development Centre, Helliswatta, Attapitiya
Address:	Helis Watta, Attapitiya, Ussapitiya, Sri Lanka
Contact No:	+94 718110710
GEF/SGP Funding:	USD 35105.00/ LKR4563650.00

Training through the field

Introduction and Objectives

There are over 60 indigenous yam varieties recorded in Sri Lanka. How ever, cultivation of yams and tubers has declined alarmingly in the recent years due to low market value, difficulties in protecting crops from wild animals and due to competition from commercially important crops such as potatoes. As a result some varieties of yams are threatened with extinction, with possible impacts on biodiversity.

Around 40 of the Sri Lankan yam varieties are available in Aranayake, a village in Kegalle District. The community members cultivate traditional yam varieties in their home gardens for household consumption. In the past 13 years the Community Development Centre (CDC) mobilized the village community in a programme to conserve traditional yam varieties, reintroduce yams as a regular food item in their diet and also introduce yam based value added products such as chips and other savoury and sweet meats to the market. The villagers have been encouraged to establish traditional agro practices with emphasis on organic farming, and adaptation of traditional knowledge to overcome the challenges in cultivation.

In this project CDC continued its work on conservation of bio-diversity through conserving indigenous yam varieties, contributing to food security through promotion of increased production of yams and increasing the monthly income of low income families through sale of yams and value added yam based products.

Value additions

Activities and Achievements

Key activities implemented were provision of plant material of 10 climate resilient yam varieties in over 200 households, development of value-added yam-based products; training and quality assurance of products, packaging, pricing and marketing strategies e.g. conducting a market survey and designing a business plan, outreach programmes, setting up of sales outlets and participating in trade fairs; construction of a production cum training centre and contributing to the conservation of the germplasm of traditional yams through in-situ conservation in Aranayake and ex-situ conservation in the gene bank at Gannoruwa.

The ten climate resilient, economically valued, indigenous yam varieties were cultivated in 205 home gardens covering 3.4 hectares. These yams are supplementing the food requirement of 900 beneficiaries, leading to decreased household expenditure on food. A total of 16 value added yam based food products have been introduced to the market with total sales in 2015 reaching LKR 43,808 (US$ 336.00). A revolving loan fund (RLF) and a savings scheme were established. The total group savings or the RLF reached LKR 5, 78,878.00 (US$4452.9) at the end of Dec. 2015.

Impact and Sustainability

Cultivation of indigenous yam varieties in home gardens has contributed to bio-diversity conservation, with each home garden having an average of 100 plants representing ten yam varieties.

Value addition and marketing have generated self-employment opportunities on a part time basis to 30 persons. Participating families have reported monthly

Indigenous yam cultivation

Quality assurance

From old to the young

income increases ranging from LKR 3500 (US$23.3) to LKR.7800 (US$52) Decreased household expenditure with the availability of yams as an additional food supplement has also contributed to this. The revolving loan fund has provided the means of obtaining urgent loan facilities to producers ensuring project sustainability as well as reducing the dependency on informal financial sources. The women producer groups have gained official recognition of the relevant government institutions for being active in community development and environment conservation.

Lessons Learnt

Capacity of women can be enhanced and mobilized to actively participate in environment conservation initiatives while also improving household income and quality of life.The project has potential for scaling up and replication in other areas with similar conditions.

To ensure sustainability, a large buffer area for yam cultivation is necessary, with due consideration paid to land management techniques and interventions against land degradation and earth slips.

Organic Tea Cultivation and Hand-Made Tea Production with Community Participation

Project title:	Small holder organic tea cultivation and promotion of hand- made tea, Galle District
Project Number:	SRL/SGP/OP5/STAR/BD/2013/08
Focal Area:	Biodiversity
Duration:	12 months 2014 - 2015
Implementing organization:	Nature Resource Conservation (NRC)
Address:	No. 04, A.H.E .Fernando Mawatha, Dangedara, Galle
Contact No:	94 77 3451386
Email:	nrcginternational@gmail.com
GEF/SGP funding:	US$ 49,480.00/ LKR 6,492,586.00

Training programme on composting

Introduction and Objectives

Small holder tea cultivation in Sri Lanka is a major source of income for the growers. The tea growers use large amounts of chemical fertilizers on their lands with the intention of increasing the green leaf harvest. This has affected the biodiversity of the tea lands and the surrounding areas. The quality of the soil and land have become severely degraded. Nature Resource Conservation (NRC), an organization promoting environment conservation sought to introduce organic cultivation to the tea small holders in the village of Poddala, Baddegama, in Galle District. The objectives were to conserve biodiversity and produce a good quality hand-made tea. The president of NRC, being a patent holder for hand-made tea production, had the necessary knowledge to process hand-made tea and designed a marketing strategy to obtain a higher price for the tea.

Activities and Achievements

At the beginning it was a challenge to get the community to convert their tea cultivations from chemical to organic, as they were accustomed to the use of agrochemicals. Later, when they changed to organic methods of cultivation, the green leaf harvest was low in the first few months. But the weight, texture and quality of the harvest were higher than earlier. After a series of training sessions and field excursions, the community were convinced of the value of growing tea

A thriving small holder organic tea cultivation

organically and 25 community members became permanent partners of the project. Each farm plot was surveyed and land use maps prepared with the support of the Natural Resource Management Centre (NRMC) of the Department of Agriculture. Soil and stone bunds and live fences were established according to the advice given by NRMC. These measures were essential in controlling soil erosion in the tea lands. Home gardening was promoted as an additional livelihood.

A marketing network was established to sell produce from home gardens which is collected weekly from the homesteads and sold in a town centre. NRC buys green leaves from the beneficiaries at a higher price which are processed manually in a central processing unit to produce a value added tea.

Impact and Sustainability

With the reduction of agrochemical usage, the biodiversity of the area is being improved. According to the findings of studies carried out by the University of Ruhuna, there was an increase in the number of species of flora and fauna in the selected home gardens at the end of the project period. A change in the soil quality and soil structure was also reported in the studies. Soil parameters such as pH, electrical conductivity, percentage of organic matter, soil texture and microbial activity have been improved.

Several types of hand-made tea are produced such as Silver Rings, Silver Ribbon, Silver Tips, Full Bud Green Tea, Black Tea, OPA and SBOPF, each different in taste, aroma and value. This processed tea is sold to a reputed exporter at a higher value of LKR.150, 000 per kilogramme. There are other economic gains for the community as the cost for fertilizers and pesticides have been cut down completely.

Beneficiaries producing hand-made tea

Different types of hand-made tea

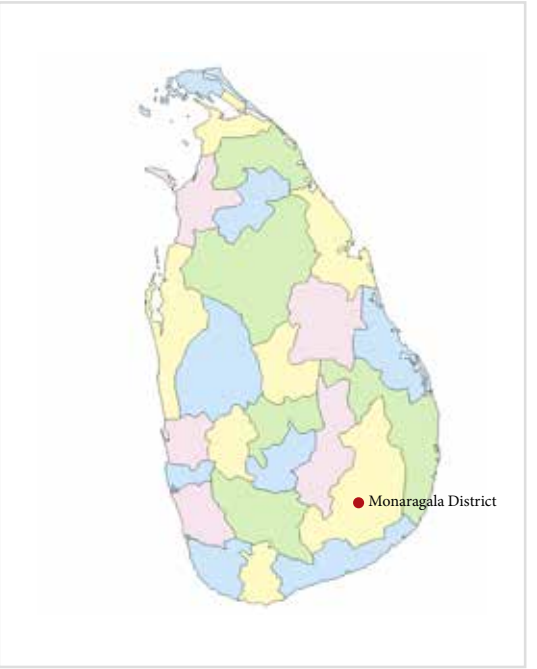
Lessons Learnt

The most sustainable strategy to conserve bio diversity and soil properties in the tea lands is to convert the conventional cultivations in to organic tea cultivations.

Non-chemical home gardening is a practicable and effective way to earn an additional income for the household and to minimize expenditure on food.

Organic tea cultivation results in a lower harvest of leaves initially but the leaves have a higher quality and a better weight which can with time, make up for the loss.

Rejuvenating a Traditional Tank Cascade System



Project title:	Agro economic development of a dry zone village, Moneragala District
Project Number:	SRL/SGP/OP5/STAR/LD/2013/05
Focal Area:	Land Degradation
Duration:	41 months 2013 -2016
Implementing organization:	Community Resource Protection Centre (CRPC)
Address:	Beheth Gabadawa Rd, Kachcheri Junction, Monaragala
Contact No:	94 77 9479196
Email:	crpc.mo@gmail.com
GEF/SGP funding:	US$ 47117.00/ LKR 6,596,419.00
Location:	Moneragala

Celebrating the assignment of the canal

Introduction and Objectives

Palukapitiya is a large tank located in Niyadella, the village adjoining Rathriwewa in Moneragala district. Most of the time the waters of the tank spill without being used for any practical purpose. In the dry season, for over six months, Rathriweva tank dries up affecting cultivation. Community Resource Protection Centre (CRPC), launched an initiative to orient the community to adapt to the changing climate. This project focused on utilizing the spill water of Palukapitiya tank and channeling it into Rathriwewa tank by means of a canal allowing 60 hectares of paddy to be cultivated in both Yala and Maha seasons.

Activities and Achievements

The main activity was to construct a feeder canal to carry water from Palukapitiya tank to Rathriwewa. The trace of the canal was agreed with the Farmers Association and the community members as it will go through 12 home gardens. The canal is 1.5 Km in length, 3 feet wide and winds its way across the road at several points and through homesteads. The farmers readily consented for the canal go through their lands as they will have flowing water throughout the year. For 200m where the land is sloping downwards the canal had to be constructed as a viaduct running on 50 concrete columns. Sand filters and culverts were constructed at necessary points. Surfacing of large

Women at work in canal construction work

rock boulders on the path of the canal forced the original trace to be changed, increasing the length of the canal by 300 meters and requiring more financial inputs. To meet the required finances the NGO raised a sum of LKR 2,269,946.00 as co-financing from the government, Rathriwewa Farmers' Association, other partner NGOs and from the community. With the construction of the canal connecting the two reservoirs, Rathriweva tank filled with the channeled spill waters of Palukapitiya tank.

Impact and Sustainability

With the availability of water over 60 hectares of paddy and 20 home gardens could be cultivated giving hope of better economic prospects for the farmers. At present 50 farmers in Yala season and 150 farmers in Maha season are receiving water for irrigation with this water.The increase in income of the farmers will also strengthen the farmers' association funds which will be utilized for repairs and maintenance works.

The canal as it flows along 1.5 km on dry land facilitates ground water recharge in the area. The home gardens through which the canal flows have water to cultivate throughout the year and are now fertile. It is expected that the wells in the area will also be recharged due to the improvement of the ground water table. Soil erosion in lands adjacent to the Palukapitiya tank is reduced as the spill water is transferred through the aqua duct where the ground is low. The transfer of water also safeguards the bund of the Palukapitiya tank as it removes the excess water pressure. While the amount of rain water received in this area has not changed, the storage, usage and management of rain water has given the above results. It is expected that the community will be self-sufficient in

Beneficiaries at work in canal construction work

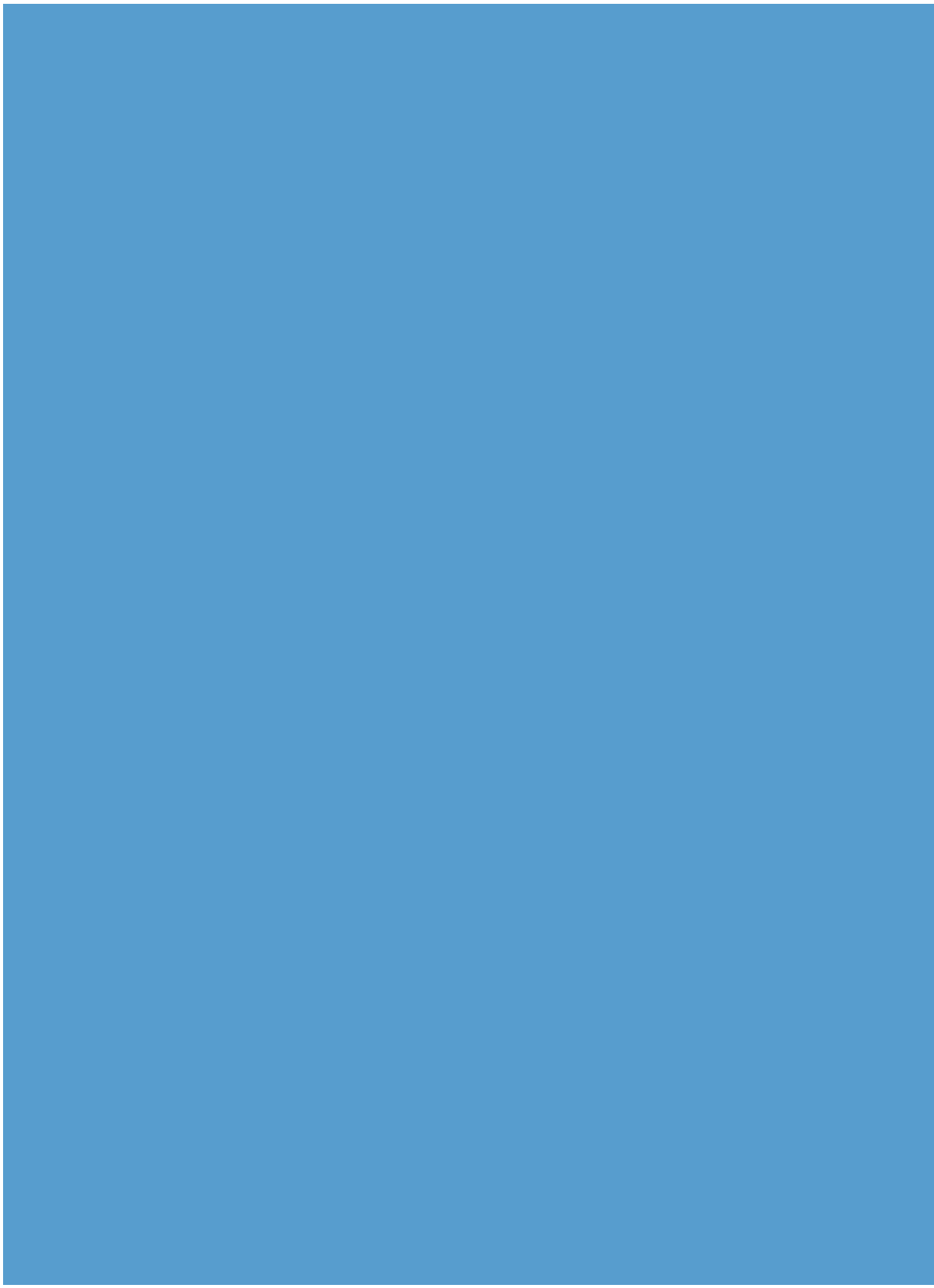
Completed viaduct

rice as the cultivation of paddy has expanded. Home gardening cultivations contribute to food provision for the family as well as better health and obtaining an income when excess produce can be sold.

With the linking of the two tanks, the tank cascade system is partially complete. A new tank 'Ransiri Wewa' is being constructed by the Department of Irrigation close to Rathriwewa tank to collect the spill water of Rathriwewa. There are also two more anicuts and small tanks to be connected to this system. Once the cascade system is fully complete it will provide water to a wider area.

Lessons Learnt

Well distributed irrigation network covering dry zone low lands can be revitalized by rehabilitating traditional tank cascade systems. Community based tank rehabilitation is an acceptable approach to advocate climate change adaptation initiatives.



STRENGTHENING COMMUNITY ACTIONS FOR BETTER CONSERVATION

Minimizing Land Degradation to Improve livelihoods of Communities living on Sloping Terrain

Project title:	Address the adverse effects of land degradation on livelihoods of communities living on sloping terrain, Kandy District
Project Number:	SRL/SGP/OP5/STAR/LD/2014/14
Focal area:	Land degradation
Duration:	12 Months (2014-2015)
Implementing organization:	Sri Lanka Centre for Development Facilitation
Address:	No.28/5, De Fonseka Road, Colombo 05, Sri Lanka
Contact No:	+94 112584883
GEF/SGP funding:	USD 42,192.00/ LKR 5,485,000.00

Commencing sustainable land management

Introduction and Objectives

The three villages Gonagangoda, Karagaskada North and Karagaskada South in Deltota DSD in Kandy district were established under a colonization scheme in 1977 and currently has a population of 455 or 120 families engaged mainly in vegetable cultivation. The Kandatenna tank (reservoir) used by the villages is fed by three canals and receives an annual rainfall of 1750 mm.

The villagers' lands of 60-70 degree slope are subjected to severe soil erosion. The national estimates quantify the erosion to be in the range of 18-70 tonnes per hectare per annum, according to the National Action Plan for combating land degradation 2015 - 2024 of the Ministry of Environment and Renewable Energy. The lands are degraded with low productivity and declining yields, aggravated by lack of water for agriculture, lack of knowledge and collective action for sustainable land management, resulting in unsustainable livelihood practices leading to increased poverty in the villages.

The main objective of the project was to build capacities of the three village communities on land management techniques with improved cultivation methods and more suitable crops to increase production

Activities and Achievements

Key activities included compilation of a detailed baseline of the area, training communities in the application of land management methods to reduce soil erosion and increase water retention capacity of soil, re-forestation of 1 hectare

Stone terracing

Live fence

in Kahatupeella forest, conservation of canal banks with bamboo planting, establishment of three CBOs, improve linkages with central and local government agencies, development of 120 home gardens, introduction of income generating activities and establishment of a revolving loan fund.

Erosion control measures were adopted in the 120 home plots with Live Fencing, Stone Terracing, Lock and Spill Drains, Contour Drains and Rubble Walls. A tree planting initiative was undertaken with the staff members and the students of the three schools under technical guidance from the Department of Agriculture. The plant nursery established provided saplings for gap planting.

Key achievements included an increase in the average monthly income of each household from LKR 20,820 (US$ 141.00) to LKR 27,020 (US$184) and 63 beneficiaries engaged in new income generating activities such as poultry, agriculture, sewing and small enterprises with loans from the revolving fund, contributing to increased household income, food security and reduced livelihood vulnerabilities.

Women participated in all project activities as members of the newly formed CBOs. They were actively engaged in the application of soil conservation measures and also managed the Revolving Loan Fund that supported the alternative income generating activities.

Impact and Sustainability

The adoption of erosion control measures in the 120 home plots resulted in a reduction of water infiltration rates, washing off of organic matter and plant nutrients in the soil, and reduction of bio-diversity losses. The tree planting initiative undertaken with the staff members and the students of the three schools prevented soil erosion in 9.2 ha. of land adjoining the schools.

Project has contributed to positive attitudinal change towards environment conservation and land management through the extensive training and education provided to the members of the participating households. Community empowerment through CBO formation, social networking and skills development have provided opportunities for greater interaction between the different ethnic groups that have contributed to enhanced social harmony and unity.

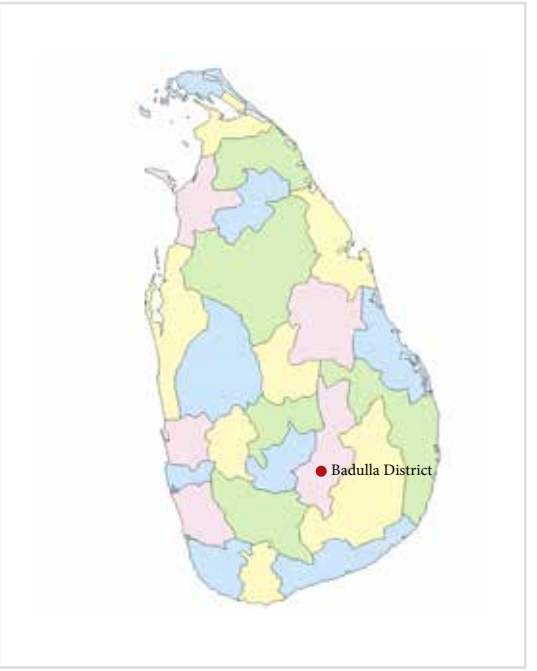
The results of implementing soil erosion control measures, tree planting and community mobilization have significant demonstrative effects for replication and up scaling other villages in the area with similar topography.

Lessons Learnt

It is important to continuously monitor and assess the effectiveness of soil erosion measures due to the increasing intensity of rainfall.

Technical guidance can greatly influence community mobilization, as demonstrated by the community commitment displayed for soil erosion control and sustainable land management under the project.

Land Management in Sloping Lands and Forest Conservation with Community Participation



Project title:	Land Management and Forest Conservation with community participation in Dikpitiya - Gannilegama villages, Badulla District
Project number:	SRL/SGP/OP5/STAR/LD/2014/23
Focal area:	Land degradation
Duration:	12 months (2014-2015)
Implementing organization:	Narangala Conservation Foundation
Address:	Dikpitiya, Tennepanguwa, Kandegedara, Sri Lanka
Contact No.	+94 715914503
GEF/SGP funding:	USD 38038/LKR 4,673,000.00

Land surveying

Introduction and Objectives

Dikpitiya and Gannilegama are traditional villages bordering a tea plantation in Badulla district. The low-income communities in the villages are largely dependent on rain-fed upland agriculture, growing pepper in homesteads and cultivating paddy with limited water for irrigation. Besides subsistence farming practices, some community members are engaged in supplying fire wood from the forest for the lime kilns in the city and in the illegal sale of forest timber harvested from the Narangala catchment area which is a 60 ha. plot of degraded tea land which has evolved as a secondary forest over the years.

The villagers face a host of major difficulties in cultivating their lands, the most crucial being the soil erosion taking place in highly sloping hilly lands resulting in high degradation, leading to low productivity and declining yields. Lack of knowledge in sustainable water usage, absence of proper markets for agricultural products, lack of technical knowledge in crop diversification has created harmful interactions with the environment further impacting on the lives of the communities. Project objectives include social and economic empowerment of the community by introducing sustainable land management practices and conserving the Narangala catchment area as a forest reserve through a participatory approach. Community outreach programmes and development of new income generating activities to minimize pressure on the forest reserve were other objectives.

Centre for forest resources

Assessment of bio-diversity

Activities and Achievements

Key activities to achieve the above objectives were, training in soil and water conservation practices for sustainable land management and home gardening, training in cultivation and management of hybrid pepper varieties and post-harvest technology for products, developing a market strategy with opportunities to access micro-finance through a revolving fund, establishing the Centre for Forest Research and Community Guidance, community surveillance to prevent illegal forest crimes, establishing fire belts to contain forest fires and the declaration of the Narangala catchment area of 60 ha as a forest reserve. Getting the Narangala forest catchment declared as a community forest reserve in November 2016 and establishing the Centre for Forest Research and Community Guidance are significant achievements of the Project.

33 women who were trained in sustainable land management and livelihood development interventions also played a significant role in planning, implementation and monitoring of project activities since its inception.

Impact and Sustainability

The overall economic, social and environmental benefits have trickled down to 63 households in the village with a population of 302 members. Adoption of sustainable land management practices preventing soil erosion in 67 plots of farm land of 47 hectares has resulted in a 22% increase in cultivated land area. A monthly average of LKR 7904.00 (US$52.6) contributed to household income through improved home gardening. According to the Department of Census and Statistics the official poverty line for Badulla District for 2017 is LKR 4047.00 (US$26.9). Thus for the primary stakeholders the relative economic status of households has shifted from low to moderate.

Villagers perceive that illegal timber extraction from the forest and forest fires have been minimized through community empowerment and establishing of forest fire belts. However, the outcome of the land management measures adopted to curtail soil erosion could not be ascertained due to lack of rain and dry weather which prevailed in the project area for more than eight months in 2015/16 period.

Declaration of Narangala forest catchment area as a Community Forest Reserve and promotion of organic farming conforms to the Government policies on environment conservation and food security.

Lessons Learnt

With technical guidance, communities can be successfully mobilized in land management to minimize soil erosion and increase the extent of cultivable land. When empowered and supported, communities are capable of convincing political authority to implement environment conservation measures such as in getting the Narangala catchment area declared as a forest reserve.

Eco-friendly Innovations in the Smallholder Rubber Industry

Project title:	Promotion of Bio Gas Technology and Energy Efficient Rubber Drying Houses to reduce GHG emissions in rubber processing, Kegalle District
Project Number:	SRL/SGP/OP5/STAR/CC/2014/15
Focal Area:	Climate change
Duration:	23 months (2014 -2016)
Implementing organization:	Human and Environment Development Organization (HEDO)
Address:	No.201, Assallakanda, Dedigama, Nelumdeniya
Contact No:	+94 71 8241311
GEF/SGP funding:	US$ 26,267.00/ LKR 3,425,000.00

Natural habitat of point endemic fish Bandula Barb

Introduction and Objectives

Rubber processing is the major source of income in the Kegalle district where smallholder lands are widely scattered. There are about 10 small scale conventional rubber processing centres and drying houses in the village of Nelundeniya, Kegalle district. Small groups of rubber growers share these centres to process latex. The majority of the rubber growers use the old, inefficient system of conventional smoke houses for drying rubber by burning firewood. Rubber sheets dried this way are of inferior quality and fetch a low price in the market. In this project Human and Environment Development Organization (HEDO), attempted to minimize CO_2 emissions through the reduction of firewood usage in rubber processing and the promotion of energy efficient rubber drying houses and to decrease water pollution by controlling the release of effluence from rubber processing and producing biogas with it.

Activities and Achievements

As a demonstration, five conventional smoke houses were converted into energy efficient drying units which are fuelled by saw dust. They have a faster drying time of a rubber sheet, of 24 hours, reducing the quantity of carbon dioxide released into the air and the ability to produce higher quality rubber sheets with a high market value.

The acidic effluence released in processing rubber contains a high percentage of organic matter. When discharged into the environment, this acidic water ferments

Bio gas plant in village homestead

Using grass cutters to avoid weedicides

Introducing rain guards to beneficiaries.

in open lands or water streams, producing gases with a pungent smell which poses a threat to the biodiversity of the area. HEDO introduced biogas technology to the rubber small stakeholders to convert this environment hazard into profits. Two model bio gas plants were built with community participation having capacities of $10m^3$ and $8m^3$ as models which generate biogas from effluence of rubber processing together with household waste. The energy produced is presently utilized for domestic cooking purposes.

The beneficiaries succeeded in getting a higher income for their produce by practicing eco-friendly procedures while producing high quality sheet rubber. The necessary technical knowledge was offered by the Rubber Development Department. Additional benefits were the introduction of rain guards to the latex collecting utensil on the tree, to prevent water seeping on to the latex during rains, making rubber tapping more viable on rainy days.

Galapitamada is home to the fish 'Bandula Barb' (Puntius bandula), a critically endangered, point endemic species which was threatened by the rubber effluence released to the water stream. As a solution the project installed a bio gas plant to use the waste water, making the water stream, the only known habitat of the species, a more conducive habitat for the Bandula Barb.

Drying rubber sheets using an energy efficient drying unit

Special mention: In January 2017 the project was placed 1st Runner-up of the ISTF (International Society of Tropical Foresters) Innovation Prize organized by the Yale University, USA to honor outstanding interdisciplinary projects that address sustainable tropical forest use, conservation and the well-being of those living in or dependent on them.

Impact and Sustainability

Small scale rubber growers and tappers in the project area have been strengthened through this project to produce high quality rubber using ecofriendly technologies. The use of energy efficient drying units, the technical training given by the project to the community and the high quality rubber being produced have contributed to the success of the project. The members are earning more income, have reduced carbon dioxide emissions and the waste water is used to produce bio gas. In addition, the introduction of alternative livelihoods such as mushroom cultivation for income generation during periods when price of rubber is low or during the rainy season when rubber tapping is not possible are activities that have contributed to the sustainability of the project.

The project had to overcome several challenges such as market monopoly, price fluctuations and reluctance by tappers to use rain guards. Another challenge was, due to the small difference between the prices of RSS 1 grade and RSS 4 grade rubber, the small holders were of the view that investing money for modifying the smoke houses to produce RSS 1 grade rubber is not profitable. These challenges are being solved with the support of the Rubber Development Department.

Lessons Learnt

Producing high quality rubber is crucial to upscale the livelihoods of small holder rubber producers. Safeguarding small holder rubber lands and the growers, is crucial in protecting the forest cover in Kegalle district. Generation of biogas from acidic waste water is a feasible and eco-friendly solution to the environment pollution caused by unmanaged discharge of effluents.

Mobilizing School Children to Advocate E-waste Minimization

Project title:	Positive Behavioural Change on E-Waste Management to minimize pollution by un-protected E-Waste, Colombo District
Project Number:	SRL/SGP/OP5/STAR/CH/2014/06
Focal Area:	Chemicals
Duration:	26 months (2014 –2016)
Implementing organization:	Emotional Intelligence and Life Skills Training Team – E-life skills training team
Address:	No.56/17, Sama Mawatha ,Dehiwala, Boralesgamuwa
Contact No:	+94 77 7263957
Email:	info@eilifeskills.org
GEF/SGP funding:	US$ 26,996.00/LKR 35,285,00.00

A stall at the world environment day commemoration 2015

Introduction and Objectives

E-waste is a global environment problem. In Colombo, the capital city of Sri Lanka, it is a fast growing problem. The problem is compounded as most people are not aware about e-waste and its environmental and health hazards. In this background E-life skills training team, an NGO dedicated to capacity building of youth, developed an initiative to address problems associated with e-waste.

Activities and Achievements

As a first step baseline data was collected from a survey in 5 selected schools in Colombo to assess the existing knowledge on e-waste. Training programmes were conducted for school children, small industries and shops dealing in electronics and NGOs to raise awareness on e-waste and established an e-waste collection network around Colombo South Municipality.

Through these programmes the target communities were made aware on how to dispose of e-waste in the correct manner. In the schools programme, e-waste collecting bins were distributed to schools in Colombo as an encouragement. To promote these activities further and to reach a wider audience, art competitions were organized which were open to school children island-wide, under poster, art and short film categories. The competition received wide public attention and many entries were received. Social media and television were used to reach more audiences.

Workshops for the academic staff of the NIE

Conducting a school programme

The e-waste collecting network in Colombo south municipality has expanded to include more than 160 small shops and 40 private companies. The NGO also initiated a door to door e-waste collection service in Colombo South area. More than 5.5 tons of e-waste has been collected by them during the project period and the collection is being continued up to date. The collected e-waste is estimated to contain more than 65Kg of heavy metals and hazardous chemicals. The waste is brought to the e-waste processing centre in Boralasgamuwa,

Free transport for E-waste

Colombo, which is licensed to store and process e-waste. They have salvaged heat sinks from the collected e-waste such as computer motherboards which are reused as components in LED lamps. These assembled lamps were donated to the SOS Children's village, Piliyandala which was an opportunity to test their performance.

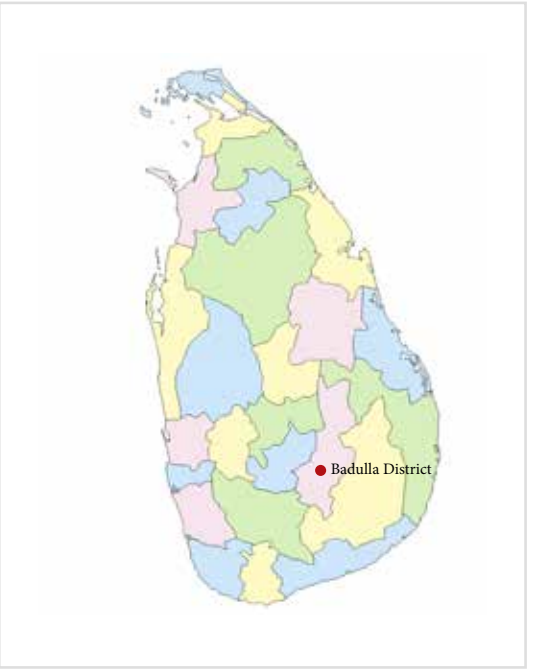
Impact and Sustainability

To ensure further awareness on e-waste, E-life skills training team advocated the inclusion of e-waste management lessons in school text books. To achieve this objective, workshops were organized for the academic staff of the National Institute of Education, who recognized the importance of including e-waste related lessons in the Science stream curriculum. The lessons will be included in school text books of grade 9 students and will provide knowledge on e-waste and their management to students from a young age.

Lessons Learnt

Majority of the people in the Colombo south municipal area are completely unaware of e-waste. E-waste is 'silently' becoming a huge environment problem in Sri Lanka. Changing attitudes of the public is one of the best methods of addressing the problem and to work towards a more sustainable e-waste management method. Facilitating school children to take the leadership in addressing e-waste issues in Sri Lanka is a decision which would result in a future with better managed e-waste.

Empowering a Marginalised Community through Awareness Raising and Catchment Conservation Practices



Project title:	Enhancing biodiversity and water catchment conservation through social empowerment in plantation communities of Hali –Ela, Badulla District
Project Number:	SRL/SGP/OP5/STAR/BD/2014/04
Focal Area:	Biodiversity
Duration:	12 Months (2014-2015)
Implementing organization:	Plantation Community Development Forum (PCDF)
Address:	No.325/A, Kanupelalla,Badulla
Contact No:	+94 774379100
Email:	stslan@yahoo.com
GEF/SGP funding:	USD 48,781.00/ LKR 3,926,950.00

Introduction and Objectives

The economy in Badulla district is largely dependent on tea. The extensive amounts of chemical fertilizers and pesticides used in tea cultivation have polluted the water catchment areas which are also drying up due to degraded forest cover. The communities live on sloping land areas prone to natural disasters such as landslides and forest fires. Their vulnerability to extreme climate-related events have also been exacerbated due to poor land management practices.

The project implemented by the Plantation Community Development Forum (PCDF) sought to conserve 8.25 hectares of water catchment areas dispersed in four tea estates with the participation of estate communities in the Hali Ela Divisional Secretariat in Badulla District. The targeted 300 beneficiaries and three schools are located in four tea estates - Uva-Ketawatte, Rosette estates I & II and Yelverton estate, who have minimum knowledge of biodiversity, watershed conservation or the importance of protecting the environment around them. The implemented project has the prime objective of enhancing the living conditions of the estate communities through conserving the catchment area of the watersheds and improving biodiversity.

Activities and Achievements

8.25 hectares of degraded catchments were restored by facilitating tree planting. It was safeguarded from further destruction by demarcating the boundaries. 4275 plants of 22 different flora species including Lasia spinosa, Bambusa vulgaris, *Caryota urens* and *Wedelia trilobata* were planted in four water catchments. The existed water scheme and the plumbing were renovated by repairing the pump house, pipes and plumbing. Two new 10,000 litre storage tanks were installed assuring a regular supply of water to the

Increasing the quality of life of an isolated community

Constructing sanitary facilities

1393 beneficiaries. 473 community members belonging to three CBOs established under the project have been made aware of the importance of catchment area and biodiversity conservation.

The health and the quality of life of 473 community members have been improved through awareness raising on better sanitary practices and constructing sanitary facilities for twelve households.

Community awareness and empowerment activities, including mobilizing 141 school children in environment protection activities, poster campaigns and forming student vigilante groups were conducted. Three field excursions to Sinharaja MAB reserve, Horton Plains and Yala national park were conducted for these student groups to improve their knowledge and interest on importance of biodiversity conservation.

Impact and Sustainability

Catchment restoration , construction of sanitary facilities and awareness provided on sanitary practices have contributed to significant improvement of water quality. This was quantified by water quality reports denoting significant reduction of faecal contamination (indicated by E.coli bacteria counts) in the tested water samples collected from the catchments restored under the project. The community development activities and catchment maintenance will be continued by the established Community Based Organizations (CBOs) in the area and they will sustain the funds through interests from the micro credit system, community contribution and member fees. The NGO

Awareness on biodiversity and environmental conservation was increased among students

Bird surveys conducted for the students improved their enthusiasm and knowledge on biodiversity

Renovated pump house and the water supply scheme

has decided to collect a monthly membership fee of Rs.25.00 from each member for the purpose of managing and maintaining the repaired water scheme. The school vigilante group formed and supported under the project is continuing awareness creation and environmental protection activities by participating in environmental promotion campaigns, biodiversity survey and peaceful protests against forest crimes and organizing environmental day commemoration events.

Lessons Learnt

As communities in the estate sector are marginalized and have little knowledge or inclination to undertake environment conservation work, they have to be closely guided to undertake activities of this nature.

The knowledge of communities living in sensitive eco-systems using natural resources needs vast improvement for them to understand the importance of conservation.

Initiatives such as catchment area restoration need technical expertise and guidance for replanting i.e. preservation of native plants and selection of new plants compatible with the location, measurement of water quality parameters and flow rates which should be provided to all stakeholders implementing the project.

Organic Farming to Combat CKDuE*

Project title:	Better Health and Environmental Assurance for Agricultural Communities in Eheranda and Wijayagama Villages Wilgamuwa, Matale District
Project Number:	SRL/SGP/OP5/STAR/CH/2014/21
Focal Area:	Chemicals
Duration:	30 months 2014- 2017
Implementing organization:	Youth Environment Forum (YEF)
Address:	Youth Environment Forum, Nuwanpura, Galewela
Contact No:	+94 77 3287529
Email:	nrdfnaula@gmail.com
GEF/SGP funding:	US$ 47,467.00/LKR 6,273,750.00

*Chronic kidney disease (CKD) is progressive loss in kidney function over a period of months or years. The symptoms of worsening kidney function are not specific, and might include feeling generally unwell and experiencing a reduced appetite.

Home garden development

Introduction and Objectives

Eheranda and Wijayagama are two low income villages in Wilgamuwa, Matale district, Sri Lanka. The lack of potable water - around 80% of the village has no access to pure drinking water and water for irrigation, poor health, lack of understanding of ecological and safe agriculture, frequent occurrences of extreme weather events affecting livelihoods are the manifold social and environmental issues faced by the villagers.

Alarmingly, nearly 25% of the families in the two villages have members diagnosed with CKDuE (Chronic Kidney Disease of unknown Etiology). This condition of agricultural farmers is suspected to be linked to the excessive and indiscriminate use of agrochemical inputs. Majority of farmers are not aware of the dangers in the application, storage and disposal of pesticides and other chemicals without safety precautions.

The project was carried out with the objectives of minimizing environment pollution by agro-chemical usage, improving livelihoods of the Eheranda and Wijayagama communities and identifying possible contributing causes for CKDuE if any, among the many environmental issues observable in the villages.

Activities and Achievements

The project activities included a survey for collection of demographic and basic socio economic data, agro-chemical usage and handling, chemical analysis of water

A medical clinic was held to diagnose CKDuE victims

Water sample collection

and soil for their suitability for usage; Training on safe pesticide handling, organic farming and livelihood development; medical clinics for identification of illnesses, treatment and referral to relevant hospitals.

Both villages are relatively small in size with 38 family units (88 male, 81 female) in Eharanda. And 57 family units, (109 male, 122 female) in Wijayagama. Major occupation of the community, 65% in Eheranda and 56.3% in Wijayagama is farming, growing paddy as the major crop, followed by kurakkan (millet), ground nut and green gram. All farmers extensively use weedicides, insecticides, fungicides, fertilizers and plant hormones as agro-chemicals.

As per the analysis, water of majority of the wells were not suitable for drinking purposes as they were contaminated with both biological and chemical contaminants above limits. Only 3 wells were identified as safe for drinking but these wells get dried up in the dry seasons. Two wells were found extremely unsafe due to biological contaminants. An agro well was identified with safe water.

At present, the Wilgamuwa Divisional Council supplies drinking water to the village which is believed to be unsafe claimed by the villagers. Although initiated, the 15 rain water harvesting tanks are abandoned due to poor awareness resulting in a considerable scarcity of safe drinking water.

Twenty-five farmers were trained in organic farming and 70 farmers were taken for a field excursion to Gannoruwa 'Agro Park' for exposure to good agricultural practices, i.e. composting, home gardening and non-chemical farming methods etc. Subsequently, organic home gardening in 2 schools and 14 traditional rice farm plots using organic farming concepts were started.

A medical clinic with the support of medical experts from Peradeniya teaching hospital was held to diagnose CKDuE victims and to provide treatment for the

patients as an increase in number of reported cases has been identified. This clinic revealed several non-conventional diseases among the communities and significant nutrient deficiencies among many age groups.

Additionally, a training programme on sewing was conducted for the women of the two villages.

Impact and Sustainability

The farming communities were made more aware in facing the realities of the increasing CKDuE victim counts, to reject unsafe water sources, and to practice safe agriculture through the corrective, curative and precautionary practices taught. The farmers were linked with a group following non chemical farming methods and to officials of the Department of agriculture and the University for practice of appropriate organic farming methods and for better health through medical assistance from Kandy and Peradeniya hospitals. .

The training programme on sewing conducted for 23 women including 3 disabled women have started sewing businesses with the support of small grants from the NGO. They are now contributing to their family economies, a substantial relief for the low income households.

Lessons Learnt

Extensive training is needed to address the poor understanding of the farmer communities on safe farming, minimizing the use of weedicides, insecticides, fungicides, fertilizers and plant hormones as agro-inputs.

As the majority of the drinking water sources are being contaminated with both biological and chemical parameters far above the WHO limits, leaving the villagers with limited sources of safe drinking water, alternatives to the dire situation have to be discussed with authorities.

Awareness and training on better nutrition, minimizing inappropriate food habits, better sanitation and occupational health, environment conservation, climate variations and extreme climate events that affect their livelihoods are a urgent need for these marginalized communities.

All of the above has resulted in male and female farmers being critically vulnerable to CKDuE and prone to non-communicable diseases and significant nutrient deficiencies among all age groups. Extended health assistance to curtail CKDuE, non-communicable diseases and nutrient deficiencies inclusive of medical treatments has to be undertaken on an urgent basis in these villages.

UPSCALING OF SGP PROJECTS

Protecting Marine Turtles through Community Participation

Project title:	Community based marine turtle conservation & community livelihood development program, Hambantota District
Project Number:	SRL/03/20, SRL/05/03, SRL/05/17 and SRL/SGP/OP4/Y3/CORE/2010/03)
Focal Area:	Biodiversity and International Waters
Duration:	003-2004 (16 months), 2005 (9 months), 2005-2007(24 months) & 2010-2011 (12 months)
Implementing organization:	Turtle Conservation Project (TCP) Address- 72\4, Old Galle Road, Walana, Panadura, Sri Lanka.
Address:	72\4, Old Galle Road, Walana, Panadura, Sri Lanka.
Contact No:	+94 383370522
GEF/SGP funding:	USD 179,777.99/ LKR 18,403,919.90

Introduction and Objectives

In the aftermath of the 2004 tsunami, many coastal communities' property and livelihoods and the natural resources surrounding them were devastated and susceptible to vulnerability. The Turtle Conservation Project (TCP) who were active in conservation work in the coastal areas of Southern Province of Sri Lanka at the time, identified communities in Rekawa fishing village and Kosgoda, as vulnerable villages which were in need of guidance and assistance in conserving the coastal ecosystem on which their livelihoods depended upon. The lagoons of Rekawa and Kosgoda are marked with sandy beaches, mangroves and egg laying visits of several species of marine turtles such as the Green, Leatherback, Olive Ridley, Loggerhead and Hawksbill turtles. The communities were engaged in activities such as killing of sea turtles, turtle egg gathering, mining of corals and cutting mangroves which depleted the natural resource base.

Based on the previous experience of the NGO and its pioneering community-based turtle conservation project initiated in 1996, they focused their activities on using environmental conservation as a livelihood uplifting mechanism for the affected communities in Rekawa and Kosgoda. The main objectives were conservation of marine turtles, providing livelihoods for Tsunami affected communities, creating education and awareness on marine coastal resources, restoration of marine and coastal habitats.

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Activities and Achievements

Villagers, mainly those who were egg poachers at the time, were trained as tourist guides and recruited to work as turtle nest protectors. A community based organisation (CBO) was formed and named as Nature Friends of Rekawa (NFR) comprising Rekawa turtle nest protectors. A 'turtle night watch' nature tourism initiative was launched as a self-sustaining exercise. In May 2006, Rekawa beach was officially declared a Sea Turtle Sanctuary by the Department of Wildlife Conservation as a direct result of TCP's conservation efforts and campaigns.

Impact and Sustainability

The community oriented efforts of conserving the marine biodiversity in Rekawa and Kosgoda led to socio-economic improvements for the coastal community as well as for the environment. The in-situ nest protection programme initiated with the project funding and the lucrative turtle night watch tourism programme was handed over to the local community members in 2012. The community members continue the work while earning a substantial income from the night watch tourism initiative. TCP continues to extend its support to the community in this work. During the tourism season between 2014 - 2015 approximately LKR 6 million (US$ 40,000) have been earned by the local nest protectors in Rekawa through the tourism initiative. The money generated is used to pay the salaries of nest protectors and other programme expenses. The local nest protectors use the centre established by TCP at Rekawa as a visitor information centre and currently villagers pay the electricity and water bills from their tourism income.

The major challenge to this programme was the development of a participatory implementation plan with the involvement of all stakeholders such as the community, Department of Wildlife conservation, TCP and Sri Lanka Tourism Development Authority. After twenty years of dedicated efforts of TCP, the Rekawa community-based turtle conservation project has finally achieved this and financial sustainability, as was aimed by TCP from the start of their conservation work in Rekawa.

Factors of Success in Upscaling Coastal Conservation Work

The main factor behind the success of this programme is the partnerships developed by TCP over the years with various institutions, through developing a network of national and international partnerships i.e. locally - with the Department of Wildlife Conservation, Sri Lanka Tourism Development Authority, both local and foreign media institutions, donor agencies and other local NGOs. The international partnerships include a strong alliance with the BBC, the Columbus Zoo, the Brevard Zoo, Auckland Zoo, U.S. Fish and Wildlife Service, Wildlife Institute of India, University of Exeter, Ocean Park Conservation Foundation and numerous other international organizations.

In achieving its goals, TCP has demonstrated that long term commitment although challenging, both financially and in sustaining interest of communities in the long term, is essential for achieving conservation goals.

TCP with its multi-talented team has expanded their interest to other areas in addition to turtle conservation work, such as education and awareness, research and surveys, community incentives, law enforcement, policy campaigns, media exposure, contributions to international sea turtle conservation and policy efforts which have benefitted communities and contributed to coastal conservation dialogue and work in the country. The expansion of work to a wide trajectory has provided multiple opportunities to TCP to establish strong linkages with both national and international institutions.

In 2015, TCP joined the Dugong and Seagrass Conservation Project, which is a global multi-country project that works in 8 nations of the Indo- Pacific region. The project aims at enhancing the conservation effectiveness of Seagrass Ecosystems supporting globally significant populations of Dugongs across the Indian and Pacific Ocean basins. This Project is executed by the Mohamed bin Zayed of Species Conservation Fund, with financing from the GEF, implementation support by UNEP and technical support from the CMS Dugong MoU Secretariat. Being one of the six project partners in Sri Lanka, Sri Lanka Turtle Conservation Project's (SLTCP) role is to enhance the conservation of Dugongs and Seagrass beds in the Gulf of Mannar, which provided an opportunity to replicate its Rekawa community based sea turtle conservation strategies and experience.

Species Conservation Through Community Actions in Protecting the Environment

Project title:	Evidence-based Conservation Project on Globally Threatened Spot-Billed Pelican (*Pelecanus Philippensis*) around Udawalawe Reservoir in Sri Lanka by Eco-Friendly Volunteers, Rathnapura District
Project Number:	SRL/06/20
Focal Area:	Biodiversity
Duration:	2006 - 2007
Implementing organization:	Eco Friendly Volunteers - EFV
Address:	ECO-V, 42/6/B, School lane, Boralesgamuwa
Contact No:	+94 113624575/ +94 718098847
GEF/SGP funding:	USD 18,000/ LKR 1,980,000

Spot-Billed Pelicans around Udawalawe Reservoir

Introduction and Objectives

Spot-billed pelicans (Pelicanus philippensis) were a vulnerable bird species according to IUCN till 2007. A project was conducted in Udawalwa area in 2006 – 2007 to map out their distribution and protect their habitats through conservation awareness among the local community. Udawalawa reservoir is one of the main feeding habitats for Pelicans and part of the reservoir belongs to the Udawalawa National Park. However, some parts of the reservoir are not a safe habitat for any wildlife including pelicans as it lies in the human settlement areas where poaching and illegal habitat destruction was recorded. There are many tank habitats in the Udawalawa area which are habitats for Pelicans and hunting of the water birds was a common activity by fishermen and visitors. According to initial surveys the public were not aware of the of Spot-billed Pelicans, their habitats and breeding habits. The location was selected therefore as a suitable project area for conservation work.

Activities and Achievements

People were hunting Pelicans for food mainly due to lack of awareness of the species. After an intensive awareness campaign specifically designed for youth, school children and the fishermen, many recognized the importance of the bird

Youth camps organized by "Friends of Pelicans" youth group

as a part of the country's bio diversity and also as an attraction for tourism. The youth of the village formed the "Friends of Pelicans" group who were active in the community awareness programmes through youth camps, tree planting and poster campaigns, exhibitions and mobilized to stop hunting of this charismatic species. Most of the fishermen who hunted the birds were fathers of these youth and could be educated through their children. When the local youth got involved in the project activities the villagers recognized it as their own project. Parents were happy to support them as they were involved in productive work. The main project outcome therefore was training the youth as Green leaders. They continue to work on environment protection, for example several of the youth work with ECO-Volunteers up to date, some joined the Department of Wildlife Conservation and some work in the tourist industry.
The main lessons learnt was conservation of species and habitats can be achieved through strong community awareness and empowering youth with knowledge and skills in innovative ways.

Impact and Sustainability

The direct impact of the project was protecting the nesting trees and feeding lakes of the pelicans. The species was re-categorized as Near Threatened by IUCN in 2007. Friends of Pelicans were innovative in their approach, for example they initiated the youth camp model called "Mihimadale Hithathiyo" which had

features such as nature walks for kids and youth. These youth camps were later funded by like-minded organizations in UK and USA. ECO-V introduced the model to Leo clubs and other school societies. Nature walks for kids and youth are still very popular in ECO-V activities. The "Friends of Pelican" group was supported in their conservation work by Eco-V after the project ended. The Group act as nature guardians by fighting against environmental destruction in Udawalwa area even after 9 years.

Health Effects of Welders Exposed to the Polychlorinated Biphenyls (PCBs)

Project title:	A study on the exposure of welders to polychlorinated biphenyls (PCBs) in Sri Lanka and creating awareness to minimize possible health effects of PCBs/POPs, Multiple Districts
Focal Area:	Chemicals/POPs
Duration:	April 2016 to June 2016
Implementing organization:	People to People Volunteers (PPV)
Location:	63 Divisional secretariat Divisions in nine Districts in Sri Lanka.
Address:	No. 10, Talahena. Negombo, Sri Lanka
Contact No:	+94717007771/+94332291160
GEF funding:	USD 28000.00 (through the UNIDO)

Medical research as part of the research study

Introduction and Objectives

The Research Study was conducted at the request of the Ministry of Mahawali Development and Environment under the project 'PCB containing and contaminated equipment in Sri Lanka' funded by the Global Environment Facility (GEF), with the technical assistance of United Nations Industrial Development Organization (UNIDO)

Polychlorinated Biphenyls (PCBs) are a group of POPs chemicals which are used as insulating material in transformers, capacitators and other electrical equipment. When these equipment are disposed of, PCBs are released into the environment contaminating air, drinking water, soil, sediment and solid waste. They travel far and wide and multiply in body fat and are found in food. Transformers imported to Sri Lanka before 1986 contain PCB pollutants and PCB contaminated oil in old transformers enter the open environment when they are reused, for example as a coolant oil. People changing oil in electric transformers and those using old transformer oil for various purposes such as in welding units are the most affected group from this pollutant in Sri Lanka.

People to People Volunteers (PPV) initiated compiling an inventory of small holder welding plants and health status of welders in Badulla District in 2008, with financial support from GEF-SGP. The study revealed that 52% of tested welding plants in the district were contaminated with PCBs. The study extended to Kalutara District in 2009-2010, showed that 63% of tested welding

Figure 2Sample Collection for PCB research study

Awareness campaigns for schools

plants contained PCBs contaminated oil. This demonstrated that an island wide survey to detect the level of PCB contamination was needed and one way of undertaking this would be by testing welding plants which release PCBs to the environment. The extended survey would be complementary to the earlier inventory of welding plants using PCB contaminated oil in Sri Lanka.

The main objectives of the present study were to expand the inventorizing of welding plants that use oils contaminated with PCBs in Sri Lanka and to record the contributing factors for usage of transformer oil contaminated with PCBs, assess the level of awareness of the welders on the health effects of PCB exposure and to create awareness on the adverse effects of PCBs on human health and the environment.

Activities and Achievements

The expanded study covered nine districts. Hundred numbers of welding workshops considered 'small' i.e. with less than 10 employees or micro household businesses that are based on self-employment were visited. From each workshop, one worker was selected for the study sample. The study clearly showed that transformer oil is used as coolant oil and the possibility of exposure and self-contamination and cross contamination of their families and the environment was high due to lack of knowledge on the properties and toxic effects of the PCB contaminated transformer oil. Poor personal hygiene practices such as not wearing personal protective gear during refilling of welding plants with coolant oil and during maintenance operations and incorrect storage and disposal of the oil would subject the workers, their families and the environment to exposure and contamination. This was verified by the fact that eye and skin problems being commonest health complaints from them. Substandard safety and welfare facilities' prevailing in these work places contributed to aggravating the situation further.

Impact and Sustainability

PPV did a trial on cleaning activity to safely remove PCB contaminated oil from welding plants. The steps were to select PCB contaminated welding plants from tested samples, safely remove the contaminated transformer oil from the welding plant in to a bulk container using relevant equipment, clean the plant three times with Diesel, insert PCB-free transformer oil in to the cleaned welding plant and test the oil again. If result did not show PCBs in the oil, a green label was pasted on the welding plant with the cleaning date, reference number, signature of the cleaner and method of cleaning. The trial cleaning was considered successful and this method can be recommended to remove PCBs contaminated transformer oil form welding plants. As a result of this study, PPV has initiated the developing of an inventory of PCBs contaminated welding plants in all districts in Sri Lanka in collaboration with the Ministry of Mahawali Development and Environment.

Lessons Learnt

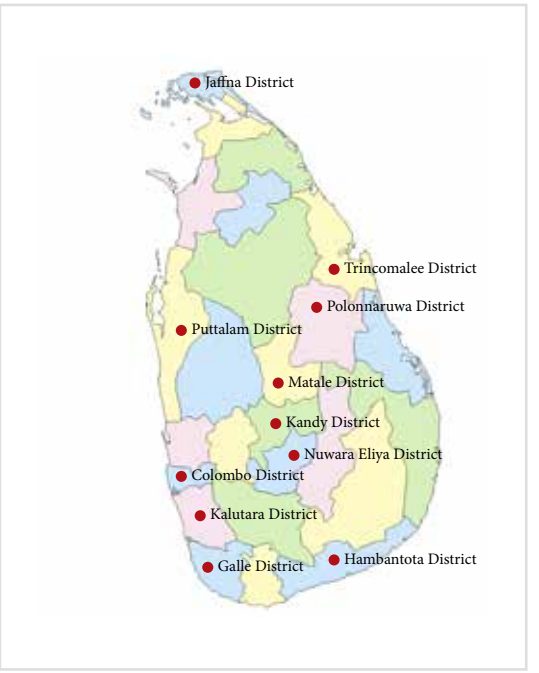
At the stakeholder workshops there was consensus that action need to be taken at two levels, at the higher level action to stop the release of PCB contaminated oil from storage yards to the open market and at the lower level, awareness raising of welders, on adverse health and environmental effects of PCBs and to make information available on where quality oil is available .

On-site awareness campaigns using mobile awareness units were developed as a tool for public awareness on POPs, to overcome the difficulty of getting welders' participation in the awareness workshops.

After the inventory was completed, safe disposal of PCB contaminated electrical transformers, other electrical and electronic equipment and welding plants from the environment was necessary. In the present study it was revealed that welders were not willing to discard their welding plants, instead they agreed to remove the PCB contaminated oil in the plants. It was necessary therefore to develop a method to safely remove the PCB contaminated transformer oil form the welding plants.

GEF FULL SIZE PROJECTS (FSP)

Strengthening Capacity to Control the Introduction and Spread of Invasive Alien Species (IAS)



Project title:	Strengthening the Capacity to Control the Introduction and Spread of Invasive Alien Species (IAS Project), Multiple Districts
Project Number:	00074810
Focal Area:	Biodiversity Conservation
Duration:	2011 - 2017
Implementing organization:	Biodiversity Secretariat, Ministry of Mahaweli Development and Environment in collaboration with UNDP Sri Lanka
Address:	UNDP, UN compound, 202 -204, Bauddaloka Mw, Colombo 7
Contact No:	+94112-580691
GEF funding:	USD 1,800,000/ LKR 198,000,000

Introduction and Objectives

The project 'Strengthening Capacity to Control the Introduction and Spread of Invasive Alien Species (IAS) in Sri Lanka' funded by GEF was designed based on the precautionary principle by addressing the threats and root causes driving IAS in the country. The country's globally significant biodiversity is being threatened by increasing introduction, establishment and spread of invasive alien fauna and flora. It is likely that the threats posed by invasion will worsen in the future as would their impacts on the natural environment, human production systems and pro-poor economic growth.

Overall objective of the Project is 'Effective control and management of IAS in Sri Lanka'. Under 'control' it was envisaged that the entry of new IAS will be prevented as well as IAS already within the country be contained. Species already within the country would require management to prevent their spread, which includes containing their threat to various other species and eco systems and, where possible, utilizing them for various purposes.

Activities and Achievements

Improved regulatory framework for IAS management - IAS Policy, Strategy and Action Plan was developed and cabinet approval was received in March 2016. Preliminary draft of the IAS Act has been developed and submitted to the legal draftsman department for approval.

Tank cleaner fish collected from Kalawewa for a research study

Aquatic IAS control – Irrigation Dept

A national coordination mechanism established is in place with the representation of 17 stakeholder agencies. IAS cells have been set up in key stakeholder institutions to facilitate IAS management activities. National Invasive Species Specialist Group was established with 25 scientists and university academics who provides technical support. Pilot projects undertaken to identify different approaches to control and manage invasive species using mechanical, manual, biological as well as integrated ecosystem approaches. 14 projects were implemented in 2014/15 and 8 in 2016.

Key stakeholders mobilized to act on IAS - Training and awareness programmes conducted at National, Provincial and in 25 districts. A residential comprehensive training course has also been established in collaboration with Sri Lanka Forestry Institute for advanced learners. Knowledge products developed and printed in 3 languages. A national data base and other social media tools have been developed and being upgraded for public awareness.

Comprehensive knowledge base for IAS control and management established - Project supported the generation of knowledge by conducting risk assessment in 2012 and 2015. Priority and potential IAS flora and fauna and their impacts have been identified. Two research symposiums conducted in 2014 (22 papers) and in 2017 (26 papers) to share the updated research findings. IAS utilization practices to produce economically important products out of IAS species has been identified by a study on feasibility assessment of IAS utilization practices.

Impact and Sustainability

This project was able to setup basic infrastructure required by the country for effective control and management of Invasive Alien Species in Sri Lanka. National Coordination Committee (NCC) and IAS cells that have been set up in each stakeholder agency and provinces to implement the IAS National Action Plan is facilitated and monitored by the Biodiversity Secretariat/ National focal point.

Lessons Learnt

The short timeframe - six months to one year was not sufficient to demonstrate the full technical and management packages required to control the spread of the IAS in a sustainable way. Their full control requires a long-term process and application of research-development based ecosystem approach.

Apart from dealing with established invasions there is an urgent need to guard against the import of new IAS which may cause damage in the future. The actions initiated such as pre-entry risk assessment will need 2 to 3 years of additional technical and research work.

Stakeholders must invest more to explore the potential utilization practices since the eradication of some of the species are becoming increasingly difficult and costly.

The Significance of "Kalinguwa" in Minor Irrigation Tanks for Climate Change Adaptation: A Case Study of Molewa Tank, Galgamuwa

Project title:	Strengthening the resilience of post conflict development to climate change risks in Sri Lanka (C-CAP Project), Kurunegala District
Project Number:	00085983
Focal Area:	Climate Change Adaptation
Duration:	2014-2017
Implementing organization:	Ministry of Disaster Management in coordination with UNDP
Address:	Vidya Mawatha, Colombo 07
Contact No:	+94 112665294
GEF funding:	USD 3,121,818/ LKR 408,958,158

Figure 1: Gate structure and earthen bund that separates Kaliguwa and Molewa main tank

Introduction

Sri Lanka has had some of the most complex irrigation systems of the ancient world developed over a thousand years by ancient rulers of the land. The Sinhalese were among the first to build completely man-made reservoirs to store water for irrigation agriculture, a concept denoting an advanced civilization dependent on stored rainwater distributed along channels and canals to a large area, for farming. Some of the reservoirs are providing water for farmers even to date. However, farmers today face many challenges including adverse impacts of climate change, in securing their living through agriculture.

This project focused on improving the capacity of minor irrigation systems in the North Western Province to increase resilience to climate change impacts with special emphasis in the restoration of specific adaptation components of a tank ecosystem. One such specific and rare component known as "Kalinguwa" is located in Molewa tank in Galgamuwa Division, Kurunegala District which was rehabilitated by the project in 2016. This case-study focuses on the role of "Kalinguwa" in ancient minor irrigation systems, its relevance and importance for climate change adaptation and disaster preparedness.

The water spread area of Molewa tank is unproportionately divided into two sections by an earthen bund which is constructed perpendicular to the tank main bund. The bigger portion of water spread area is referred to as the "main tank" while the smaller portion is referred to as "Kalinguwa" which is physically separated from the main tank. The project connected the Kalinguwa

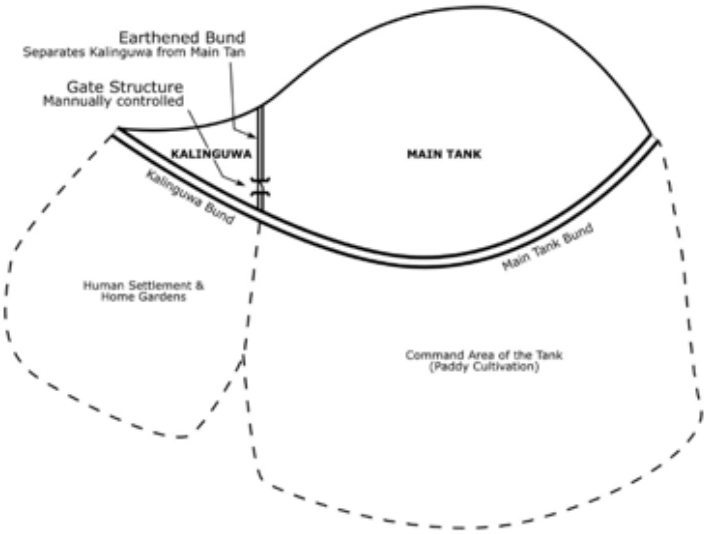


Figure 2 Diagrammatic presentation of Kalinguwa

with the main tank directly through fixing a manually controllable gate structure enabling storage and control of the flow of water (Figure 1). The main tank has the command area and the human settlement is located behind the Kalinguwa (Figure 2). "Kalinguwa" is a Sinhala term used in the ancient tank terminology derived from the combination of two Sinhala terms "Kal" and "ingu" or 'ingi'. 'Kal' means 'time' or 'period' and 'ingu' or 'ingi' means a hint or a clue. When those two terms are put together it gives the meaning of 'fore warning' or clues of disasters to come (Tennakoon.M.U.A., 2015).

Baseline information demonstrates that almost all the farmers lacked water for irrigation during the final stage of their paddy crops in Galgamuwa, except those cultivated under the Molewa tank in the Maha cultivation season. "Kalinguwa" of Molewa tank acted as an additional water storage to the main tank and the farmers utilized it to protect their paddy crops during droughts. The additional water storage in Kalinguwa also recharges ground water in the dug wells located in the downstream settlement. In addition to paddy cultivation, the farmers are able to cultivate vegetables in home gardens throughout the year. Thus the Kalinguwa minimizes paddy crop failures, supports diversification of agricultural livelihoods and improves food and nutrient security by ensuring water availability for agriculture.

During excessive rainy situations, farmers release water from the main tank to Kalinguwa in order to minimize the pressure for the main tank bund. In extreme flood events, farmers cut open the bund of Kalinguwa to release extra water of the main tank through Kalinguwa and thereby protect the Molewa tank's main

Figure 3: Satellite map of Molewa tank

bund from potential flood damages. This enables farmers to continue tank based agriculture practices even immediately after a devastation.

The findings conclude that the Kalinguwa improves resilience of farming communities in both drought and flood conditions which occur more frequently with increasing intensity. Kalinguwa can be recognized as evidence that ancient irrigation technology in the construction of village irrigation systems remains an asset in facing present and future climate change challenges. It is recommended that the water sector adaptation projects should restore such distinct adaptive features of minor tanks at a time the country is vulnerable and need to combat climate change challenges via mitigation and adaptation approaches that are time tested.

Creating Perennial Benefits From Bamboo

Project title:	Bamboo processing for Sri Lanka, Islandwide
Project Number:	GEF SEC project ID: 4114, GEF agency Project ID: XX/SRL/09/X01
Focal Area:	Climate Change/ Technology Transfer
Duration:	2012 – 2019
Implementing organization:	United Nations Industrial Development Organization / UNIDO
Address:	Ministry of Industrial Development, 73/1 Galle Road, Colombo-03, Sri Lanka
Contact No:	+94 11 232 5869, 254 2103
GEF funding:	USD 2,355,000/ LKR 307,327,500

Tissue culture propagation of Bamboo species

Introduction and Objectives

Bamboo is a particularly versatile and fast growing plant species. Especially in tropical areas, it is capable of growing to large diameters even on sloping and degraded lands which are no longer suitable for food crops. It can be used to stabilize slopes, reduce erosion and protect headwaters in hilly land areas. The objective of the project is to develop a bamboo supply chain and product industry in Sri Lanka and to make bamboo a timber/fuel wood substitute as a large demand for wood as an energy source exists. These activities once implemented will reduce logging pressures on the bio-diverse forests. The waste from bamboo processing is promoted as feedstock material. Overall this project aims at contributing to sustainable land use strategies and reduced global environmental impact from GHG emissions, while developing a green and sustainable industry base. An important component of the project will be the revolving fund (non-grant instrument) to sustain impact beyond the immediate project duration.

The project has a special focus in promoting the use of bamboo in multiple ways. They are :

Engineered bamboo materials for structural applications and interior / furniture industry (e.g. flooring, cabanas in tourism industry, etc.);

Use of bamboo waste as energy source, (e.g. pellets for local energy use and for export markets) and source material for charcoal production (biochar) and,
Bamboo shoots as an edible product to be promoted in restaurants and the food processing industry

The targeted technology transfer components include:

The transfer of bamboo tissue reproduction technology and bamboo processing technology and the transfer of bamboo waste pelletizing technology, (also suitable for other residue, e.g. rubber wood or agro-waste)

Activities and Achievements

Public awareness workshops and stakeholder consultations have been conducted which have generated enthusiasm from the public.

A project website and face book group has been set up for dissemination of bamboo related knowledge and facilitation of a community of practice.

Identification of potentially suitable lands for growing bamboo and suitable bamboo species for Sri Lanka and industries and a private sector bank to administer the revolving fund are completed.

Consulting with a private sector tissue culture laboratory for production of bamboo plants, Identification of nurseries for bamboo plant hardening and a market research study are concluded.

Networking with the relevant Ministries and coordination with UN agencies and NGOs about projects with joined objectives and potential co-benefits are on-going at present.

Impact and Sustainability

Planting bamboo can provide a broad range of environmental benefits for land restoration and water cycle improvement. Moreover the development of a bamboo industry will generate greenhouse gas benefits through a range of mechanisms.

Bamboo can be substituted for other non-wood, energy intensive materials and therefore the CO2 emissions in the production of this other materials are avoided. And in the case where bamboo replaces tropical timber products, the CO2 emissions from deforestation are substantially reduced.

Bamboo can be harvested without clear-cutting, therefore the soil carbon content is safeguarded more than in other crops.

Bamboo processing into higher value added products result in considerable biomass waste, which can be used for energy production. Because of the high yield of bamboo, there is net gain in sustainable bioenergy production compared to conventional forest plantation such as rubber.

Large clump of *Dendrocalamus gigantheus* (8 years old)

Well established clump of *Dendrocalamus asper* in Galle district

Bamboo waste provides a sustainable feedstock source for charcoal production, which can be used as soil amendment to improve water retention of the soils –a climate change adaptation measure, as well as in sequestering carbon and improving soil organic carbon content - a climate change mitigation measure.
If bamboo pellets are used for co-combustion in coal fired power plants or in coal fired industrial boilers, emissions are reduced.

As a by-product of plantations edible bamboo shoots can be harvested. This crop eases the pressure on land use for food production and helps therefore to reduce deforestation and diversify incomes.

Lessons Learnt

The potential of bamboo as timber substitute and innovative industrial resource is barely utilized.

Land use related policy making is fragmented, and responsibilities are split between the Department of Forests, Department of Wildlife Conservation, Ministry of Environment and Mahaweli Development, Department of Irrigation and Ministry of Agriculture whose policies often contradict.

Specific tenure arrangements for bamboo are necessary, to ensure sustainably harvesting. Certification could help but would require a specific setup, different to classical timber forestry projects, since bamboo can be harvested annually.
Other projects of similar objectives e.g. REDD++ so far have largely ignored the opportunities provided by bamboo as a resource material.

Indicators for indirect environmental benefits e.g. avoided deforestation, accounting for carbon sequestered from non-timber forest products e.g. in bio-charcoal, need to be improved to document and account for benefits from the bamboo industry.

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