Local Action Global Impact

Voices from the Knuckles Landscape

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Global Environment Facility - Small Grants Programme
OP6 funded Projects Implemented in the
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1. Biodiversity 2. Climate Change 3. Land Degradation 4. Persistent Organic Pollutants
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Message from the Secretary, Ministry of Environment

I am pleased to send this message to the "Local Action Global Impact - Voices from the Knuckles Landscape" a book prepared by the Global Environment Facility (GEF) - Small Grants Programme (SGP), UNDP Sri Lanka office. Sri Lanka is an island blessed with outstanding natural beauty and a culture that has embraced the principles of sustainable development in its actions throughout history. As a nation, Sri Lanka has consistently demonstrated its commitment to the global effort in protecting the environment, promoting social justice and fostering economic prosperity.

The biodiversity of Sri Lanka is significantly important both on a regional and global scale. Sri Lanka has a varied climate and topography, which has resulted in rich biodiversity, distributed within a wide range of ecosystems, and has the richest biodiversity per unit area in the Asian region.

As a small island and a developing nation, Sri Lanka is highly vulnerable to the adverse effects of climate change. Ratification of the Paris Agreement further to the United Nations Framework Convention on Climate Change (UNFCCC) is one more step forward for committing Sri Lanka to address climate change and related issues.

Ministry of Environment is the National Focal Point for the United Nations Convention on Biological Diversity (UNCBD), United Nations Framework Convention on Climate Change (UNFCCC), and United Nations Convention to Combat Desertification (UNCCD) which were agreed upon at the Earth Summit held in Rio de Janeiro in June 1992.

The GEF - SGP embodies the very essence of sustainable development by "Local Action global impacts" by providing financial and technical support to projects that conserve and restore the environment while enhancing people's well-being and livelihoods. The SGP demonstrates that community action can maintain the delicate balance between human needs and environmental imperatives. The programme supports three ecologically sensitive landscapes in Sri Lanka; the Colombo wetlands, the Knuckles world heritage site and the coastal region from Mannar to Jaffna. This publication focuses on the Knuckles landscapes highlighting best practices and lessons learned and how such community initiatives can be directed to policy level initiatives.

I am happy that the Ministry of Environment has played the lead role in this effort by providing national policy guidance to implement the activities with the NGOs and CBOs supported by the GEF-SGP in the Knuckles landscape.

I would also like to express my gratitude and appreciation to the key players of this work led by the GEF-SGP Sri Lanka office supported by the public and private sectors, academia and civil society organizations.

Dr. Anil Jasinghe
Secretary

Message from the Global Manager, GEF Small Grants Programme

Global environmental degradation is threatening the survival of all species on Earth. Going forward, we have no alternative course of action but to conserve critically important ecosystems and biodiversity, land and soil, air and water, and address climate change issues. We need to find a balance between human wellbeing and planetary health.

For centuries, local communities have played a key role as stewards of natural resources and ecosystems on which they rely on. Now, more than ever, their participation is essential to restore and conserve our natural environment.

The Small Grants Programme (SGP), a corporate programme of the Global Environment Facility that is implemented by the United Nations Development Programme, has been supporting community efforts to address global environmental issues by promoting innovative solutions that take into account social, economic and community values, while ensuring community ownership of these initiatives. As we celebrate SGP's 30th anniversary and assess the cumulative results of the programme, we recognize that the impact goes well beyond the participating communities, contributing to the development of policies and good practices across the globe.

In this publication, we feature 14 initiatives supported under the sixth operational phase of SGP in Sri Lanka over the last five years. These case studies also demonstrate that long term commitment is vital when engaged in restoring and conserving ecosystems with local communities.

One of the cases featured in this publication – a project that has been implemented in Hettipola – demonstrates the power of local action in conserving sensitive ecosystems by promoting sustainable alternative livelihoods. Under the initiative, the first ever Women's Knowledge Bank in Sri Lanka was established, connecting 52 women's societies and benefitting approximately 2,000 women by providing technical advice and support related to agriculture, besides strengthening the established women farmer societies to achieve higher standards of productivity, management and sustainability. This women-led initiative supported and empowered female farmers and entrepreneurs by improving their capacities and amplifying their voices through gender mainstreaming to build their own self-sustaining business ventures.

We hope this publication provides powerful and useful examples on the fundamental role that local communities, including Indigenous Peoples, women and youth groups, play in environmental conservation. I also hope these stories inspire all to replicate and scale up community solutions and contribute for a systemic change to shift the current trajectory towards a sustainable future.

Yoko Watanabe
Global Manager
GEF Small Grants Programme

Message from Resident Representative of UNDP Sri Lanka

Established in 1992, the year of the Rio Earth Summit, the GEF Small Grants Programme (SGP) embodies the very essence of sustainable development by "thinking globally acting locally". 30 years on, by providing financial and technical support to projects that conserve and restore the environment while enhancing people's well-being and livelihoods, SGP demonstrates that community action can maintain the fine balance between human needs and environmental imperatives.

The GEF-Small Grants Programme implemented by the United Nations Development Programme (UNDP) in Sri Lanka is designed to enable community organizations to take collective action for adaptive landscape management for socio-ecological resilience, to conserve biodiversity, optimize ecosystem services, manage land and water sustainably, and mitigate climate change. Operating in three ecologically sensitive landscapes; the Colombo Wetlands, The Knuckles World Heritage site and the Coastal Region from Mannar to Jaffna, the Sixth Operational Phase 6 (2017-2021) has seen transformational results in the lives of Sri Lankans from across the country.

From forest encroachment to seasonal fires, illegal logging, gem mining and disorganized expansion of tourism, the Knuckles landscape in particular faces numerous threats to its ecologically sensitive areas. Working on the ground together with 14 NGOs from both Kandy and Matale Districts, SGP in the Knuckles Conservation Forest and its Buffer Zone landscape has contributed to the promotion of Agro-ecology, Biodiversity conservation, Soil conservation and Wetlands rehabilitation, along with the discovery of 10 new endemic herp species which includes 6 snakes, 3 amphibians and 1 skink, a truly remarkable achievement for the project.

Using a landscape approach through where we work with communities and multi stakeholder groups through the lessons learnt, the dedicated symposiums will aim to highlight, upscale and promote these policy initiatives and results.

This publication provides a snapshot into the results in the Knuckles Conservation Forest and buffer zones landscape, sharing best practices on community-based approaches with the intention of further development and replication beyond its borders. UNDP congratulates our key partners including; the Ministry of

Environment, members of the National Steering Committee, the Multi-stakeholder group led by the Additional District Secretary of the Matale district, Technical Advisor of SGP and the Field Coordinator of the Knuckles Landscape, civil society and environmental organizations, private sector, community grantees and the GEF-SGP project team on this knowledge product, which will help inform efforts towards biodiversity protection and climate change adaptation in Sri Lanka.

Robert Juhkam

Acknowledgements

We would like to extend our sincere thanks to SLEES for documenting the case studies, undertaking the field visits and for the detailed interviews carried out with project partners. The spirit in which members of SLEES undertook the work, as a part of a learning process rather than of mere recording of work, is much appreciated.

We also wish to thank the National Steering Committee, Knuckles Multi-Stakeholder Group, the SGP Technical Advisor Dr. D.B. Wickremasinghe and the Knuckles Field Coordinator Mr. Piyasiri Gunasekara and the SGP Programme Assistant Mr. Nuwan Perera for their contribution to this publication.

Our grateful thanks are extended to Dr. B.M.K. Perera, for the advice on the writing, detailed editing of case studies and all assistance given to make this publication a reality.

The hard work of the members of the Knowledge Management Team of SLEES, namely Mr. Ruwan Weerasooriya, Mr. Nanda Senarathne, Mr. Dushan Samaranayake and Ms. Sithumini Anuradha, in completing the work of this publication is gratefully acknowledged.

Finally, we acknowledge with thanks Mr. T.P.G. Amarajeewa and the staff of Neo Graphics for the designing and printing of this publication.

Dinali Jayasinghe
National Coordinator of GEF-SGP
UNDP Sri Lanka

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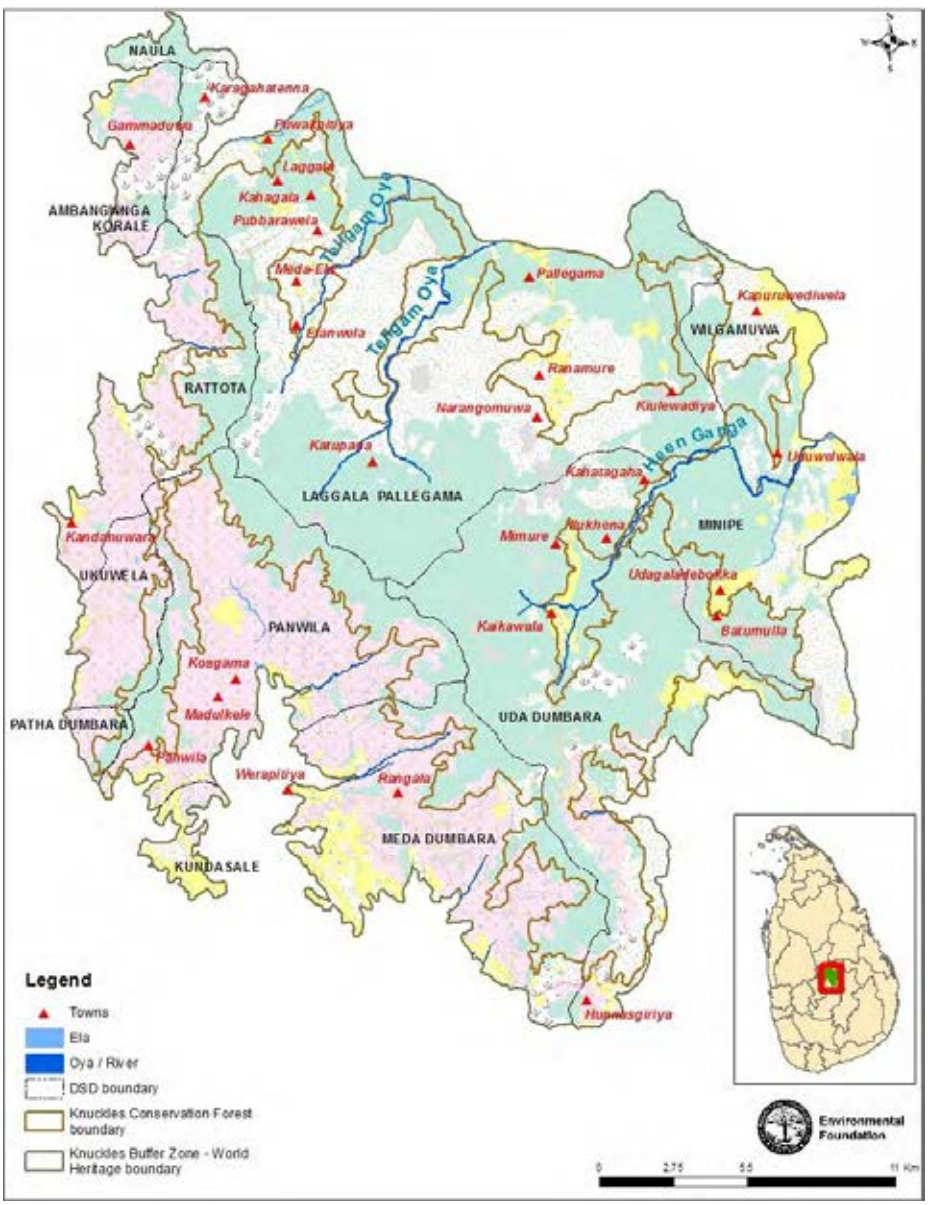
Abbreviations & Acronyms

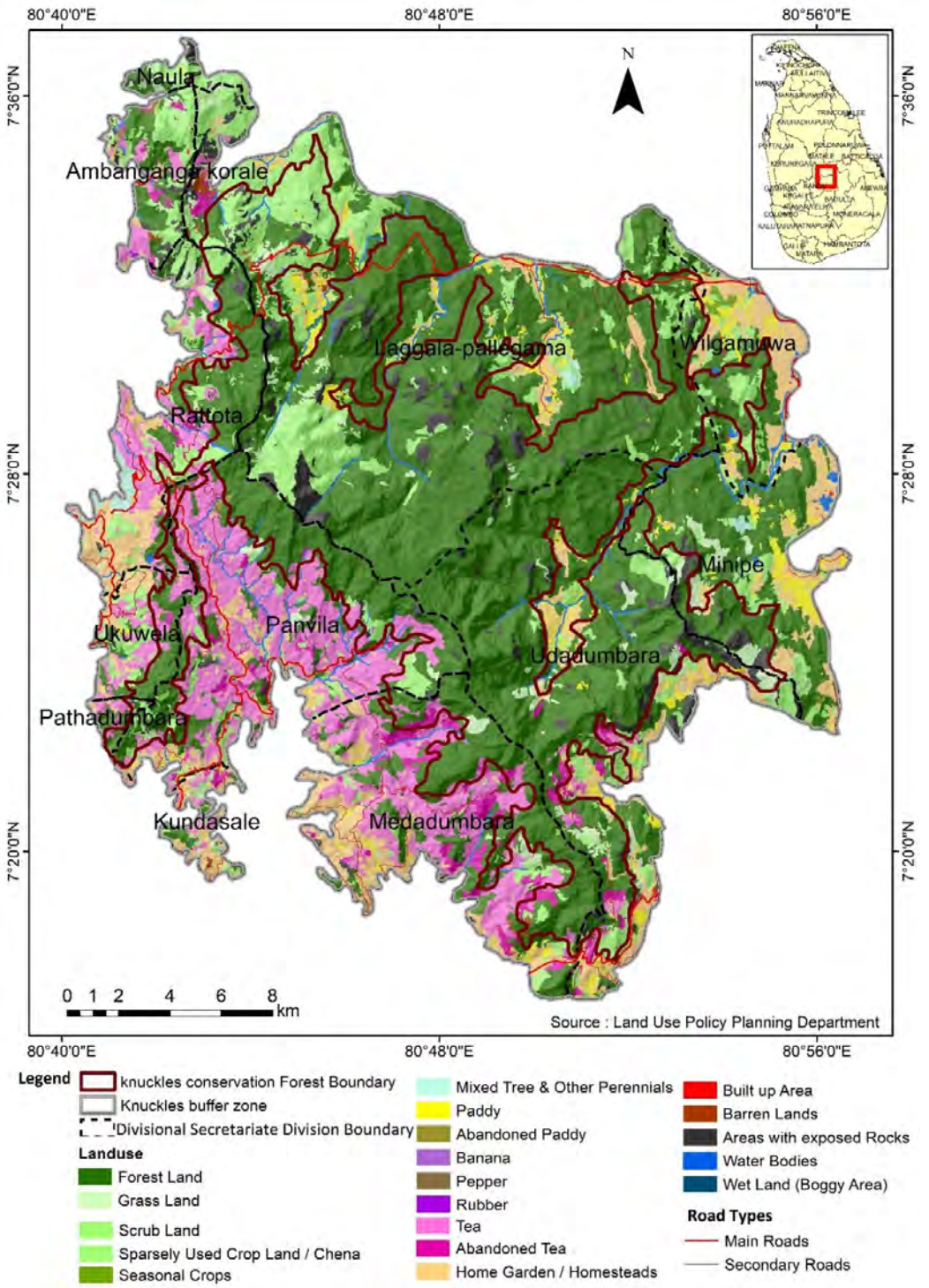
AAT	- Anurudha Arana Trust
ACDC	- Arunalu Community Development Centre
BCP	- Bio-cultural Community Protocol
CBO	- Community Based Organization
CDC	- Community Development Centre
CIIKS	- Centre for Integrated Indigenous Knowledge Systems
COMDEKS	- Community Development and Knowledge Management for Satoyama Initiative
CRPC	- Community Resource Protection Centre
DEA	- Department of Export Agriculture
DOA	- Department of Agriculture
DS	- District Secretariat
DSD	- Divisional Secretariat Division
DVD	- Digital Video Disc
DWC	- Department of Wildlife Conservation
EEA	- Etanwala Environmental Association
EPSKMS	- Ekabadda Praja Sanwardhana Kantha Maha Sangamaya
FD	- Forest Department
GAFEC	- Grama Abhiwurdhi Foundation for Environmental Conservation
GAP	- Good Agricultural Practices
GCE (O/L)	- General Certificate of Education: Ordinary Level
GEF	- Global Environment Facilities
GN	- Grama Niladari
ha	- Hectares
HFSL	- Herpetological Foundation of Sri Lanka
IBMBB	- Institute of Biochemistry, Molecular Biology and Biotechnology
ICDWF	- Integrated Community Development Women's Federation
ICRAF	- International Centre for Research in Agroforestry

IDEA	- Integrated Development Association
IUCN	- International Union for Conservation of Nature
KCF	- Knuckles Conservation Forest
km	-Kilometres
KSSS	- Kandegama Shrama Shakthi Samithya
m	- Meters
MA	- Mahaweli Authority
MMD&E	- Ministry of Mahaweli Development and Environment
MTHGS	- Meemure Traditional Heritage Guardian's Society
NDF	- Nirmanee Development Foundation
NEUF	- National Ethnic Unity Foundation
NGO	- Non Governmental Organization
NMNH	- National Museum of Natural History
NTFP	- Non-Timber Forest Products
OP6	- Sixth Operational Phase
PGS	- Participatory Guarantee System
PLDF	- Peoples' Livelihood Development Foundation
RDA	- Road Development Authority
REFR	- Rathna Ella Forest Reserve
ROP	- Registrar of Pesticides
RTP	- Rangiri Thakshana Piyasa
SALT	- Sloping Agricultural Land Technology
SGP	- Small Grants Programme
SLEES	- Sri Lanka Environment Exploration Society
SLSPC	- State Plantation Corporation
UCPs	- Upgraded Country Programmes
UNDP	- United Nations Development Programme
UNESCO	- United Nations Educational, Scientific and Cultural Organization
USA	- United State of America
USD	- United States Dollar
WNPS	- Wildlife and Nature Protection Society of Sri Lanka

Introduction

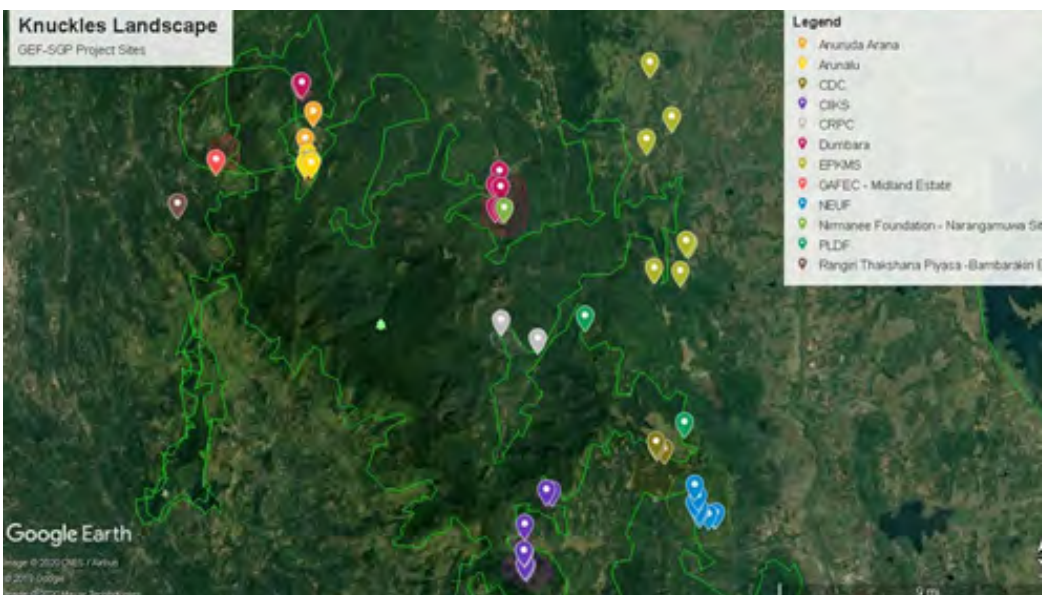
The Knuckles Mountain Range lies in the Central Highlands of Sri Lanka in the districts of Matale and Kandy. The range takes its name from a series of recumbent folds and peaks in the west of the massif, which resembles the knuckles of a clenched fist when viewed from certain locations in the Kandy district. The Knuckles Conservation Forest Area spans approximately 31,305 hectares. As of 2010, the Knuckles Conservation Forest (KCF) has formed a part of the designated Central Highlands of Sri Lanka World Heritage Property, including the Peak Wilderness Protected Area and the Horton Plains National Park.

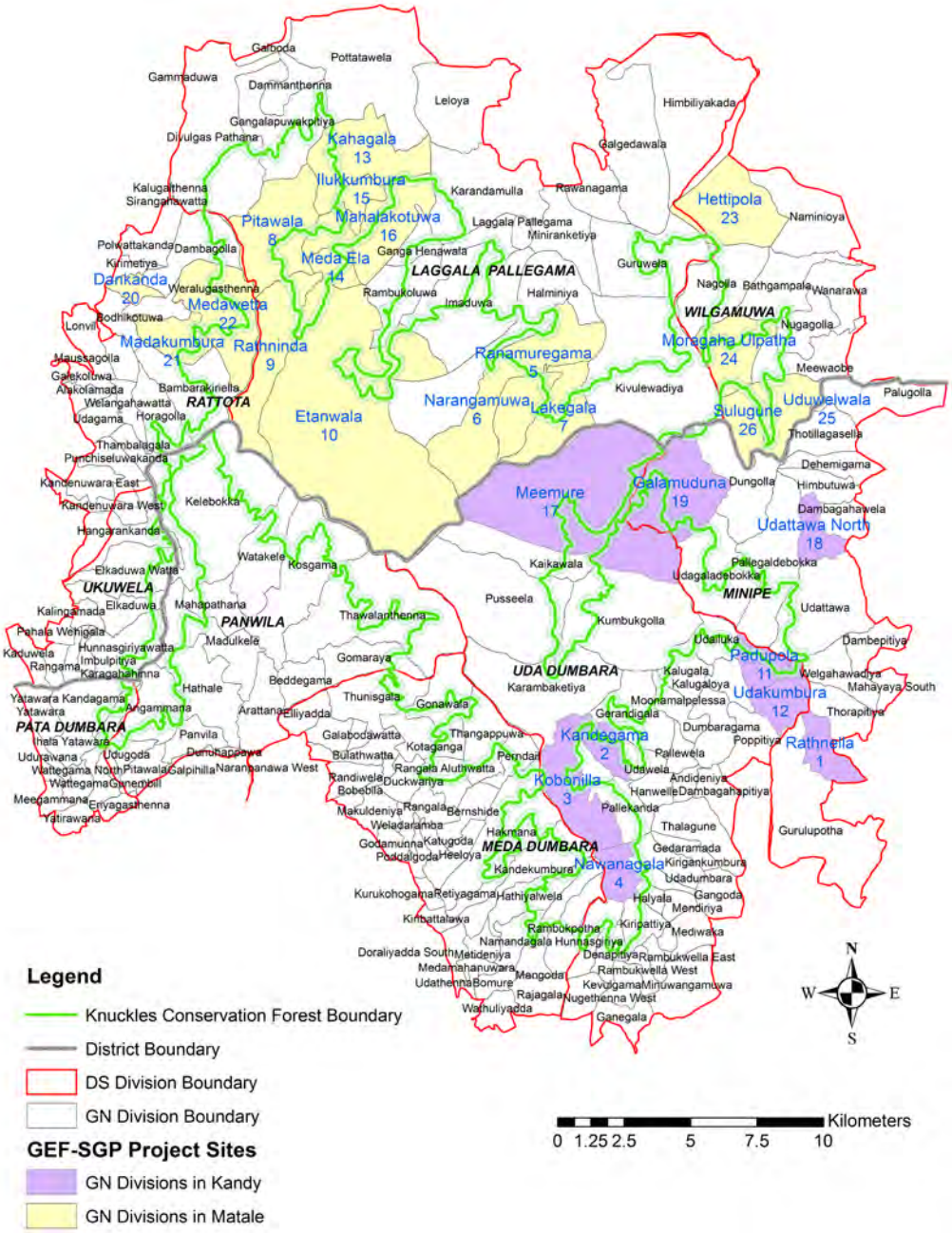



80°40'0"E
80°48'0"E
80°56'0"E
7°36'0"N
7°28'0"N
7°20'0"N
N
Naula
Ambanganga korale
Laggala-pallegama
Wilgamuwa
Rattota
Minipe
Ukuwela
Panvila
Udadumbara
Pathadumbara
Kundasale
Medadumbara
0 1 2 4 6 8 km
Source : Land Use Policy Planning Department
Legend
knuckles conservation Forest Boundary
Knuckles buffer zone
Divisional Secretariate Division Boundary
Landuse
Forest Land
Grass Land
Scrub Land
Sparsely Used Crop Land / Chena
Seasonal Crops
Mixed Tree & Other Perennials
Paddy
Abandoned Paddy
Banana
Pepper
Rubber
Tea
Abandoned Tea
Home Garden / Homesteads
Built up Area
Barren Lands
Areas with exposed Rocks
Water Bodies
Wet Land (Boggy Area)
Road Types
Main Roads
Secondary Roads

Due to its diverse natural vegetation, which includes lowland rainforests and montane forests, the Knuckles area records a very high and a unique level of biodiversity. It contains important endemic species such as the Knuckles pygmy lizard and Knuckles rock frog. It is also a habitat for many animals such as leopards and elephants. Further, the Knuckles range is one of the 70 listed Important Bird Area sites in Sri Lanka, and is a vital watershed, providing 30% of the water to the Mahaweli river basin and its reservoir system.

Over the years, many environmentally sensitive areas of the Knuckles Region have suffered degradation due to human activities. Some areas in the KCF are prone to natural disasters, including climate-induced events such as extreme floods and landslides. The buffer zone of the Conservation Forest is particularly affected due to the lack of protective regulations. The three major threats to the KCF and its buffer zone are forest fires, unregulated tourism and lack of proper waste management. Other issues include soil and water pollution, encroachment, cardamom cultivation, gem mining, unsustainable exploitation of non-timber forest products, deliberate setting of forest fires, forest clearing and the presence and introduction of invasive species. The lack of clear boundary demarcation of the conservation forest, land disputes within the KCF and divestment of unproductive tea lands were identified as important issues affecting the area. Degradation and the loss of habitat for many endangered species of flora and




Galboda
Pottatawela
Gammaduwa
Dammanthenna
Leloya
Himbiliyakada
Gangalapuwakpitiya
Divulgas Pathana
Kahagala 13
Galgedawala
Kalugalthenna
Siranganawatta
Ilukkumbura 15
Karandamulla
Rawanagama
Hettipola 23
Naminioya
Pitawala 8
Mahalakotuwa 16
Laggala Pallegama
Miniranketiya
Polwattakanda
Dambagolla
Kirimetiya
Meda Ela 14
Ganga Henawata
LAGGALA PALLEGAMA
Guruwela
Dankanda 20
Weralugasthenna
Rambukoluwa
Halminiya
Nagolla
Bathgampala
Wanarawa
Medawetta 22
Imaduwa
WILGAMUWA
Bodhikotuwa
Nugagolla
Lonvil
Madakumbura 21
Rathninda 9
Ranamuregama 5
Monegaha Uipatha 24
Meewaobe
Maussagolla
Garekoluwa
Arakolamada
Bambarakiriella
Kivulewadiya
Palugolla
Welangahawatta
RATTOTA
Narangamuwa 6
Lakegala 7
Uduwelwala 25
Udagama
Horagolla
Etanwala 10
Sulugune 26
Thotillagasella
Thambalagala
Panchiseluwakanda
Dehemigama
Kandenuwara East
Meemure 17
Galamuduna 19
Dungolla
Himbutuwa
Kandenuwara West
Kelebokka
Dambagahawela
Hangarankanda
Udattawa North 18
Watakele
Kosgama
Kaikawala
Pallegaldebokka
Elkaduwa Watta
Udagaladebokka
UKUWELA
MINIPE
Kalingamada
Elkaduwa
Mahapathana
Pusseela
Udattawa
PANWILA
Thawalanthenna
Kumbukgolla
Pahala Wehigala
Madulkele
Udaluka
Dambepitiya
Kaduwela
Hunnasgiriyawatta
Padupola 11
Imbulpitiya
Gomaraya
UDA DUMBARA
Kalugala
Welgahawadiya
Rangama
Karagahahinna
Karambaketiya
Kalugaloya
Mahayaya South
Hathale
Beddegama
Moonamalpelessa
Udakumbura 12
Yatawara Kandagama
Thunisgala
Gerandigala
Thorapitiya
Yatawara
Angammana
Arattana
Elliyadda
Gonawala
PATA DUMBARA
Dumbaragama
Inala Yatawara
Galabodawatta
Thangappuwa
Kandegama 2
Poppitiya
Rathnella 1
Udurawana
Udugoda
Bulathwatta
Kotaganga
Perndar
Pallewela
Wattegama North
Pitawala
Galpihilla
Naranbanawa West
Rangala Aluthwatta
Udawela
Andideniya
Wattegama
Gwendbill
Randiwela
Duckwariya
Kobonilla 3
Hanwella
Dambagahapitiya
Meegammana
Eriyagasthenna
Bobebila
Pallekanda
Yatirawana
Makuldeniya
Rangala
Bernshide
Thalagune
Gurulupotha
Weladaramba
Hakmana
Godamunna
Katugoda
MEDA DUMBARA
Gedaramada
Poddalgoda
Heeloya
Kandekumbura
Nawanagala 4
Kirigankumbura
Udadumbara
Kurukohogama
Retiyagama
Hathiyalwela
Halyala
Gangoda
Mendiriya
Kiribattalawa
Kiripattiya
Rambukpotha
Mediwaka
Namandagala Hunnasgiriya
Doraliyadda South
Metideniya
Denapitiya
Rambukwella East
Medamahanuwara
Rambukwella West
Udathenna
Bomure
Mengoda
Kevulgama
Minuwangamuwa
Rajagala
Nugethenna West
Wathuliyadda
Ganegala
Legend
Knuckles Conservation Forest Boundary
District Boundary
DS Division Boundary
GN Division Boundary
GEF-SGP Project Sites
GN Divisions in Kandy
GN Divisions in Matale
N
W
E
S
0 1.25 2.5 5 7.5 10
Kilometers

fauna had reached critical levels. The last aspect was addressed to a certain extent by establishing several Environmentally Sensitive Areas (ESA).

The Small Grants Programme (SGP) and the Upgraded Country Programmes (UCPs) of the UNDP implemented a community-based landscape approach as their core programming framework for the Sixth Operational Phase (OP6) of the Global Environment Facility. The Knuckles Conservation Forest and the buffer zone were identified as one of the three landscapes to enable community-based organizations to take collective actions for adaptive landscape management for socio-economic resilience.

The case studies presented in this book are initiatives the GEF-SGP, and provide a snapshot of projects implemented during the OP6 period of 2017 – 2021 in the Knuckles Conservation Forest and buffer zone landscape. The GEF-SGP provided grants to 14 Non-Governmental Organizations (NGOs) to address important GEF focal area issues such as biodiversity conservation, land degradation prevention and knowledge management.

The GEF Small Grants Programme of Sri Lanka was launched as a pilot initiative in 1994. During the six subsequent GEF operational phases (1997- 2021), the Sri Lanka programme has funded over 450 community-led initiatives, with the 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 30-year period, the Sri Lanka Country Programme has built extensive portfolios in the GEF thematic areas, testing and adopting various approaches in project implementation with community-based organizations with different capacity levels. In the OP6, the programme has followed a landscape approach guided by the COMDEKS Satoyama Initiative, and has supported initiatives in biodiversity conservation, agro-ecology, prevention or mitigation of land degradation and wetland rehabilitation as some of the main support areas. Continuous capacity building, including awareness and knowledge dissemination among communities was undertaken to ensure community buy-in and project sustainability. Livelihood development activities formed a 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 advice and knowledge management were obligatory to achieve quantifiable results. This called for the involvement of relevant institutions to give the grantees essential skills and guidance.

Another important aim of the programme was to develop successful models for replication and scaling up of successful projects. The approach used was to share experiences and promote the broader involvement of multiple stakeholder organizations. Lessons learned over time have been helpful for developing new initiatives to achieve higher levels of project success and scale-up activities. Community Initiatives in policy implementation were a vital aspect of the programme. The case studies presented in this book show how such community initiatives can help make better policy decisions and enable implementers to achieve desired goals.

This publication showcases initiatives that have adopted a community based approach towards conservation and protection of the KCF. The success stories presented in this publication may help develop and conserve many environmentally sensitive areas within Sri Lanka and beyond its borders. For instance, in the area of biodiversity conservation, communities have come forward to safeguard forests as ecosystems essential for their wellbeing and as a resource base for their livelihoods. The willingness of empowered communities to protect and conserve forests is truly remarkable. In addition, research initiatives undertaken in the KCF have succeeded in adding new knowledge to the understanding of the richness of the biodiversity of the area.

Enterprise development through the development of underutilized crops is an example of sustainable use of biodiversity and its long term conservation. The conservation and documentation of traditional knowledge were emphasised as high priority initiatives. Eco-tourism development initiatives were implemented to create a sustainable income source for the communities without their having to exert pressure on the conservation forest.

In the area of climate change adaptation, the initiatives implemented by the project were highly appreciated by the communities who had suffered heavily due to climate variations and extreme weather events in the past. Long dry spells

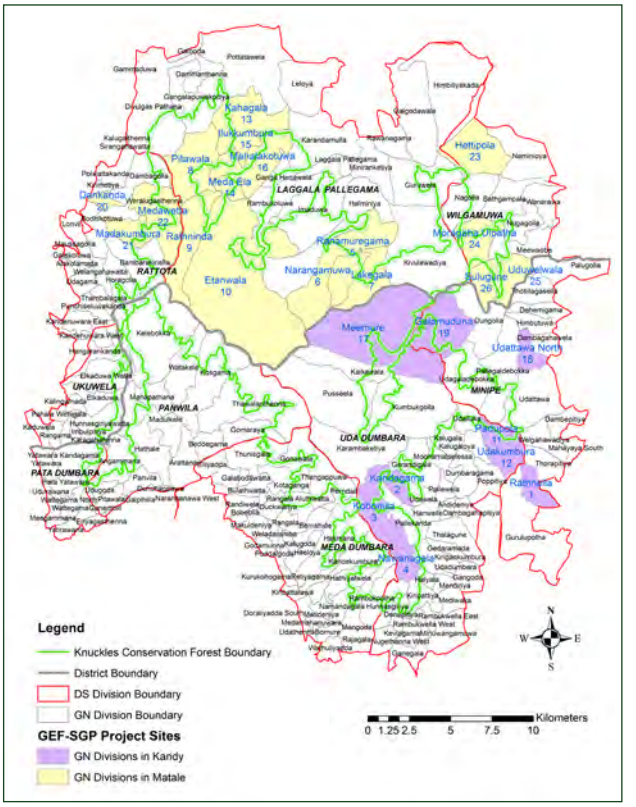
and the consequent lack of water for cultivation and the inability to channel water to where it was needed were important issues addressed by the project.

Working with farmer communities trying to eke out an existence practising agriculture in degraded hill slopes enabled to identify best practices for improving agricultural productivity in these lands. The role of women in ensuring the adoption of good land management practices was identified as a vital success factor. Women's traditional best practices were documented for use by future generations.

This book, therefore, is not merely a presentation of initiatives undertaken by the SGP but an illustration of good practices and lessons learnt in implementing challenging projects. It highlights favourable outcomes that can be achieved when communities are empowered and motivated to protect ecosystems and manage the land they cultivate using eco-friendly cultivation practices.

Biodiversity Conservation

Conservation of Unique Herpetofauna of the Knuckles Conservation Forest



Project No:	SRL/SGP/OP6/STAR BD/2018/09
Grantee Organization:	Herpetological Foundation Gte. Ltd. (HFSL)
Location:	Kandy and Matale Districts
SGP Contribution:	$35,000.00
Cash Co-Financing:	US$ 138,100.00
In-Kind Co-Financing:	
Project Duration:	24 months
Focal area:	Biodiversity

Background

The Knuckles Conservation Forest (KCF) lies within the Kandy and Matale districts and spans 31,305 hectares (UNESCO, 2008) . As of 2010, the KCF has formed a part of the designated Central Highlands of UNESCO World Heritage Property, including the Peak Wilderness Protected Area and the Horton Plains National Park. The KCF comprises a mountainous terrain where the land rises to 760-1900 m above sea level and consists of 35 peaks, a complex of interconnected mountain ranges, steep bluffs and waterfalls. It is also an important watershed of the country. The Knuckles area records a very high and unique level of biodiversity. According to the Herpetological Foundation of Sri Lanka (HFSL), the area contains 23 point endemic fauna species , with a vast number of possible new species that remain to be identified.

Animal Group			2018			2022		
	Recorded from Sri Lanka		Recorded in (KCF)		Endemic to (KCF)	Recorded in (KCF)		Endemic to (KCF)
	Total	Endemic	Total	Endemic		Total	Endemic	
Amphibians	112	99	28	19	8	28	19	8
Snakes	108	55	47	18	1	49	20	3
Tetrapods reptiles	134	102	39	25	11	39	25	11
Total	354	256	114	62	20	116	64	22

Table 1. Comparison of number of species in the KCF with the country situation

Most of the habitats of these species are under severe anthropogenic pressures. Almost all the more serious threats are directly or indirectly linked to human activities such as encroachment, Illegal construction, forest clearing, gem mining, poaching, and initiating forest fires. The cultivation of cardamom and establishing tea plantations within the KCF in the past have also created many problems not only due to the encroachment but also due to the use of unsustainable agricultural practices. Human activities may also have contributed to the spread of invasive alien species, causing further problems to the already threatened biodiversity of the KCF. In addition, the collection of important plant and animal species was also identified as a serious threat to the area's rich biodiversity. The resulting adverse effects could lead to impoverished biodiversity or even extinction of the more vulnerable species. Some such species are categorized as threatened according to the Global Red List of the IUCN (2019). Therefore, it is critically important to do everything possible to discover all possible species of herpetofauna available in the protected area, create a record of details relating to their habitats and minimize environmental degradation so that these wonderful animals will thrive in the long term.[1]

1 World Heritage Centre, (2008), https://whc.unesco.org/en/list/1203 Accessed 14 June 2021
2. IUCN Trekking guide

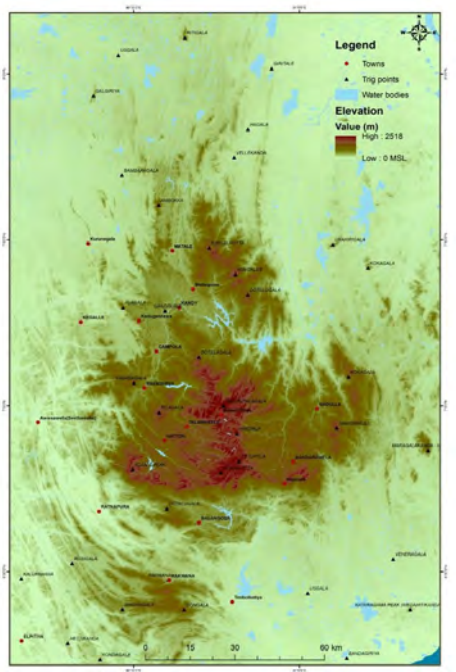
The project designed to achieve the goal of sustainable conservation of herpetological fauna in the Knuckles area was headed by **Mr. Mendis Wickramasinghe,** President of the **Herpetological Foundation Gte. Ltd (HFSL),** supported by a team of highly qualified experts.

Project Objectives and Key activities

The HFSL implemented the following strategies to restore and conserve the varied habitats of the Knuckles area:

- Conducting research and exploring the habitat to record new species as well as species known to science
- Educating the diverse stakeholders on the importance of conserving herpetofauna, and
- Advocating policy planning to ensure the long-term sustainability of project initiatives

A rapid survey using random sampling was carried out from June 2018 to September 2020 in the landscape. Several sites, namely Deanston, Dotalugala and Corbet's gap, Elkaduwa – Hunnasgiriya, Gammaduwa, Karagahathanna, Kalupahana–Meemure,Rabukoluwa,Riverstone,Pitawala,Laggala,Puwakpitiya, and Pallegama were surveyed during the initial stage based on geographical characteristics, elevation changes, different climatic zones and forest types. The information generated was supplemented by data collected in previous observations. The HFSL surveyed 75 locations in and around these focal regions and collected samples of unidentified herpetofauna. The new material was compared with preserved specimens available in the National Museum of Natural History (NMNH), Sri Lanka and Natural History Museum, London. Available published literature was also used to obtain an in-depth understanding of the collected specimens. All types material was deposited in the NMNH and the National Wildlife Training Center, Girithale, Sri Lanka. Molecular studies were carried out at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB) using standard methodology and protocols



used in molecular phylogenetic studies. A rapid survey using random sampling was carried out from June 2018 to September 2020 in the landscape. Several sites, namely Deanston, Dotalugala and Corbet's gap, Elkaduwa – Hunnasgiriya, Gammaduwa, Karagahathanna, Kalupahana – Meemure, Rabukoluwa, Riverstone, Pitawala, Laggala, Puwakpitiya, and Pallegama were surveyed during the initial stage based on geographical characteristics, elevation changes, different climatic zones and forest types. The information generated was supplemented by data collected in previous observations. The HFSL surveyed 75 locations in and around these focal regions and collected samples of unidentified herpetofauna. The new material was compared with preserved specimens available in the National Museum of Natural History (NMNH), Sri Lanka and Natural History Museum, London. Available published literature was also used to obtain an in-depth understanding of the collected specimens. All type material was deposited in the NMNH and the National Wildlife Training Center, Girithale, Sri Lanka. Molecular studies were carried out at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB) using standard methodology and protocols used in molecular phylogenetic studies.

Data collected from the field on the presence or absence of herpetofauna in all 75 locations were tabulated. All sites were areal-photographed to identify potential threats due to human activities in the surrounding area and to gather and record information on the relevant habitat types. The IUCN guidelines were followed in the assessment of endangered species. Ultimately, the generated survey data and field observations were put together to map sensitive areas within the Knuckles landscape.

In search of rare and threatened species

The difficult task of collecting of specimens in dense forest

The project emphasized identifying new reptile and amphibian species and raising awareness on their conservation among the various publics including school children, academics, government officials and policymakers. A total of 22 awareness programmes were carried out in the region. Most of these awareness

programmes were focused on important stakeholders such as the Road Development Authority (RDA), the Forest Department (FD), the Department of Wildlife Conservation, the District Secretariat and the Local Police, as these organizations play an important role in preventing damage to the environment.

A meeting with key stakeholders to raise awareness about recent findings

The initial expectations to carry out awareness programmes for school children had to be suspended due to the COVID-19 related school closure. As an alternative, the HFS conducted education and awareness programmes via Zoom and YouTube platforms. The videos were viewed by more than 10,000 persons over four months.[1]

Environmental impact

The survey succeeded in discovering two new species of point endemic snake species. They are *Aspidura desilvai* , a rough-sided snake species, and *Rhinophis gunasekarai*, a shield-tailed snake species. These nocturnal underground snake species are endemic to the Knuckles mountain range and are critically endangered. Details about the discovery were duly published in the international journal Zootaxa by Wickramasinghe and others in 2019 and 2020. The HFS takes pride in

1. Wickramasinghe, L. M., Bandara, I. N., Vidanapathirana, D. R. & Wickramasignhe, N. 2019. A new species of Aspidura wagler, 1830 (Squamata: Colubridae: Natricinae) from Knuckles, World Heritage Site, Sri Lanka. Zootaxa, 4559, 265-280.
2. Wickramasinghe, L.J. Mendis; Vidanapathirana, D.R. & Wickramasinghe, N & David J. Gower 2020. A new species of Rhinophis hemprich, 1820 (Reptilia: Uropeltidae), from the cloud forest of the Knuckles Massif of Sri Lanka. Zootaxa 4810 (1): 65-80

the fact that the Postal Department and the Department of Wildlife have printed stamps to commemorate the World Wildlife Day by depicting these two newly discovered point endemics of the Knuckles area. Also identified were 12 new species of herpetofauna (7 snakes, one skink and four amphibians) found only in the Knuckles massif. These will be reported in future publications. All the data gathered under this project has been shared in the Global Red Listing of Reptiles and Amphibians. As a policy decision drawn from the findings, the Knuckles region was declared a Key Biodiversity Area in the Assessment of Reptiles.

Aspidura desilvai

Rhinophis gunasekarai

It was significant that the Moragahakanda and Kaluganga, two major irrigation development projects, benefited from the soil erosion reduction on account of the revision of the road expansion project facilitated by the HFSL. The HFSL also contributed its expertise to the Moragahakanda Development Project to explore the possibility of using the Kaluganga reservoir as an indigenous fish breeding and distribution site.

The HFS proposed structural modifications to the construction of roads and drains to minimize soil erosion and reduce the velocity of run-off water down the slope. The RDA established these and constructed the drains to convey the major portion of the run-off to the reservoirs without damaging the pristine

environment. In addition, the drains facilitate the safe movement of snakes and other animals from place to place along both sides of the road.

Socio-Economic Impact

The discovery of new species from the KCF has made the area popular as a biodiversity hotspot both nationally and internationally. Therefore, the eco-tourism and nature tourism industries will hugely benefit from the expected increase of tourist visits to the area. It would enhance the livelihoods of the people such as tourist guides, accommodation providers and shopkeepers.

Youth Engagement

The HFSL is keenly aware that the sustainability of initiatives would be possible only if the youth of the surrounding areas would become active participants in biodiversity conservation. The project team trained school children and university students who volunteered to participate in fieldwork. They also contributed to ongoing research. These able supporters of research and fieldwork included 25 students from the University of Kelaniya and 50 members of the Young Zoologist's Association and the Zoological Garden, Dehiwala. It is noteworthy that the project team and the students and school children who volunteered for fieldwork were both males and females.

Sustainability

The HFSL has a long-term vision to conserve biodiversity through research, education and awareness and for Sri Lanka to be recognized as a mega biodiversity hotspot. With over two decades of experience in the conservation of herpetofauna, the principal investigator and his team of researchers have made a significant impact on the global community. The HFSL has participated in several international workshops and has provided expertise to enrich the knowledge on herpetofauna among many stakeholders responsible for biodiversity conservation in Sri Lanka. Unrelenting efforts by the HFSL have led to the declaration of the KCF as a Global Key Biodiversity area. It is a significant achievement resulting from years of field and laboratory work dedicated to conserving the country's biodiversity.

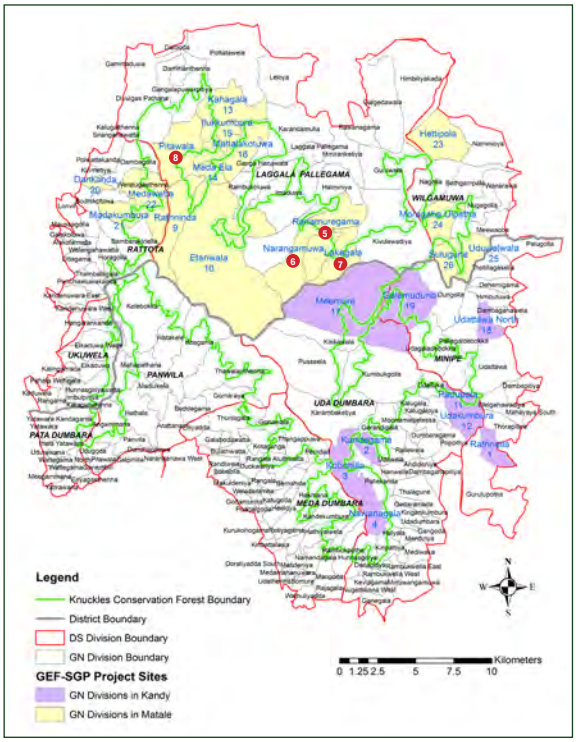
The project's achievements have attracted several donor agencies willing to support the conservation efforts. Dilmah Conservation, Commercial Bank of Ceylon PLC. and Wildlife and Nature Protection Society of Sri Lanka (WNPS) have pledged their support to sustain the activities after the termination of

the project. Perhaps the biggest hope and strength lie in the youth who have volunteered to participate in project activities and government officers who have collaborated with the project staff. Their continued support will be an asset to the successful continuation of project initiatives.

Partners

- Department of Wildlife Conservation and the Department of Forest: Assisted by granting necessary permission to conduct the fieldwork and facilitate museum reference work overseas.
- Dr. David J. Gower of the Department of Life Sciences of the Natural History Museum, London and researchers of the IBMBB of the University of Colombo: Assisted in research work to identify new species.
- Nagao Natural Environment Foundation and Dilmah Conservation: Supported to procure required technical equipment.
- Commercial Bank of Ceylon PLC: Contributed partial funds for molecular studies.
- Volunteers from the University of Kelaniya and Young Zoologist's Association: Supported the fieldwork.
- Postal Department and the Department of Wildlife: Printed stamps to commemorate World Wildlife Day by depicting two newly discovered point endemics of the Knuckles area.
- Wildlife and Nature Protection Society of Sri Lanka (WNPS): Supported fieldwork

Community-Based Biodiversity Conservation of the Knuckles Area



Project No:	SRL/SGP/OP6/STAR/BD/2018/08
Grantee Organization:	Dumbara Mituro Environment & Cultural Foundation
Address	Dumbara Mituro - Environment & Cultural Foundation, Coordination Office, Arangala, Naula
Telephuone:	071 5361349
Email:	dumbaralk@yahoo.com
Location:	Ranamure, Narangamuwa & Pitawala GN Divisions, Laggala DS, Matale
SGP Contribution:	US$40,000.00
Cash Co-Financing:	
In-Kind Co-Financing:	US$ 15,150.00
Project Duration:	33 months
Focal area:	Biodiversity

Background

Pitawala Pathana in the backdrop of misty blue mountains

Pitawala Pathana is a montane grassland with a unique ecology located in the Knuckles Conservation Forest (KCF) in Riverston, Matale. It spans 10 hectares and can be accessed via the Rattota Illukkumbura Road. It is home to numerous endemic flora and fauna species such as *Watessa (Drosera burmanni)*, *Binara (Exacum trinervium)*, *Kandulessa (Drosera Indica)*, *Nilmonaressa (Utricularia reticulata)* and *Pathan Ala (Brachystelma lankana)*. This delicate ecosystem is threatened by invasive plants and human activities such as uncontrolled tourism-related activities, especially the parking of vehicles inside the Pathana area. According to the Forest Department (FD), more than 100,000 tourists visited the Pitawala Pathana in 2018. As a result of these tourist visits, the habitat of the point endemic species, Marbled Rock Frog *(Nannophyrus marmorata)*, was threatened by humans frequenting areas where frogs mate and reproduce. Further, before the vehicle park was established, the visitors used to park their vehicles in the Pathana where the threatened endemic Pathan Ala plants are found. In addition to these problems, high levels of soil erosion were also reported by the FD.

Three GN divisions located in the KCF, Ranamuregama, Narangamuwa and Lakegala have a total population of around 1000. After the Knuckles area was declared as a conservation forest in 2010, people of these GN divisions lost their main source of income which included cardamom cultivation in the forest

and *hena* cultivation. Deprived of an income source and lands, they started commercial vegetable cultivation in paddy fields with excessive agrochemicals. This practice became a threat to the delicate ecosystems, soil and water quality and the biodiversity of the area. This situation led to the rise of some chronic diseases. Also, the excessive use of agrochemicals started to pollute the land and water sources. These lands serve as watersheds which feed the recently built Kalu Ganga reservoir which supplies water for drinking and agriculture to some parts of the dry zone of Sri Lanka. Also important is the fact that a tremendous amount of indigenous as well as traditional knowledge related to treating diseases or disorders and performing of rituals is available with the elders of these villages. This priceless knowledge was under the threat of being lost permanently.

Dumbara Mithuro Environment and Cultural Foundation, led by **Mr. Nimal Kanaheraarachchi,** with the participation of villagers of the above GNDs, focused on finding solutions to above problems and implementing practical approaches in the project area.

Project Objectives and Key Activities

The main objectives of the project were to conserve the biodiversity and the ecosystem while ensuring the improvement of the livelihoods of the villagers. The project also emphasized the implementation of sustainable land and water management practices and the conservation of the ancient cultural heritage of the area.

Mr. Nimal Kanaheraarachchi showing the main display board at the Pitawala Pathana to the former Resident Representative of the UNDP - Sri Lanka

The project also had to address some problems caused by several invasive plant species. For example, Giant Mimosa *(Mimosa pigra)* plants had proliferated widely, especially along main roads. Although Blue Snakeweed *(Stachytarpheta cayennensis)* is not an invasive plant species, the FD has identified it as invasive to the Pathana ecosystem. Under the supervision of the FD, invasive plant species such as *Sudda (Austroeupatorium Inulifolium)*, *Wal Inguru (Zingiber zerumbet)*, *Gahala Wel (Colocasia esculenta)*, *Pathan Palu (Austroeupatorium inulifolium)*, *Ganda Pana (Lantana camara)*, *Balu Naguta*, *(Stachytarpheta indica)*, *Pani Thora (Senna occidentalis*) and *Podisinghomaran (Chromolaena odorata)* were controlled in 2 hectares of land located within the Pathana. A 50m long boundary wall was established to prevent parking of vehicles inside Pitawala Pathana.

The boundary wall to prevent tourists from parking vehicles within the Pathana

The project sought to educate the public visiting the Pitawala Pathana on the importance of the ecosystem and its diverse endemic flora and fauna. Dumbara Mithuro worked with the FD and Dumbara Surakinno (Protectors of Dumbara), a CBO formed by the FD to renovate the resting area and fix display boards with messages and instructions relating to the conservation of biodiversity and the ecosystem of the Pathana. A more detailed display board containing in-depth information on biodiversity was put up at the entrance. Dumbara Mithuro printed two brochures in English and Sinhala about the Pitawala Pathana and distributed them free of charge to visitors. They also started educating visitors about the invasive species on-site and provided volunteering opportunities to remove invasive plants, under their supervision.

There are six watersheds located in the Ranamuregama, Narangamuwa and Lakegala GNDs. The boundaries of these watersheds had to be identified and demarcated using boundary stones and display boards. Since ancient times, the villagers have used some bathing places within these watersheds. They were renovated and stabilized for safe use.

The community was trained on eco-friendly agricultural practices to preserve the soil and prevent water pollution. The project distributed various seeds and planting materials to 30 families and exposed them to good agricultural practices designed to improve productivity, and make it possible for villagers to earn a steady income in their home gardens.

Beneficiaries of the watershed restoration programme in Ranamuregama

Eco-friendly home gardening, the use of value-added Non-Timber Forest Products (NTFP) and medicinal plants and spice production were promoted to increase the families' income. The project also provided 500 litre water tanks to 15 families and one 5000 litre tank to store water for use in home gardens during drought spells.

A sales centre was established in the Laggala town to market farmers' products. Five women engaged in making conventional food items were supported to improve the quality of produce, packaging and marketing capabilities.

To improve the eco-tourism industry in the whole Knuckles area, 50 young

individuals, including four young women, were trained as tourist guides in a 3-day residential training programme parallel to the International Mountain Day

Preparing indigenous medications the age-old way

Dumbara Mithuro supported five traditional doctors to prepare and promote six traditional medicinal oils used for general ailments such as catarrh and joint pain. A descriptive label was introduced to go along with the products to popularize the preparations in the outside market. There are three registered Ayurvedic physicians practising indigenous medicine in the project area. They were supported to provide their services to a larger population of villagers. Two facilities were constructed for use by the traditional doctors so that they could manufacture high quality medicinal oils professionally. A five-acre herbal garden was established, and several medicinal plants such as *Karanda*, *Bulu* (*Terminalia bellirica*), *Nelli* (*Phyllanthus emblica*), fruits plants and Asoka (*Saraca asoca*) were planted in the selected area.

The project team collected and documented indigenous knowledge in various fields such as rituals, traditional medicine, folklore, mythology, knowledge relating to making weather predictions, histories of ancient villages, etc. This knowledge will be invaluable to future generations.

Dumbara Mithuro published a book titled Rawanapura Athdutu Ath Beheth, which contains ancient herbal recipes and remedies used in Laggala for eye diseases, bone fractures, snake bites, etc. Five hundred copies of the book have been disseminated to schools and libraries, free of charge. Conservation of Ola leaf manuscripts owned by traditional doctors was initiated.

Twelve newspaper articles were published, and 20 videos were posted on their YouTube channel called Udarata News. A book titled Batadandu Kandu Watiye Urumaya which contains information on the cultural and historical background

of the Knuckles area and its environment was re-published. Four water springs in Ranamuregama were conserved. Development and fixing of tourist information boards in Pitawala Pathana, demarcation of two treks in Riverstan and Lakegala (Rawana Trek) and training and registering of 10 trekkers were important outcomes of the project designed to promote tourism in the area.

Environmental Impact

The FD identified a suitable area for reforestation, and 60 hectares of the Pathana were conserved by the project. With time, this will bring about tangible benefits to conserve the biodiversity of the area.

Removal of invasive plants in Pitawala Pathana

The herbal garden established covering an area of 5 hectares in Ranamuregama Kunumulla will benefit Ayurvedic physicians who will be able to harvest various medicinal plants used for preparing medicinal oils. Altogether 60 hectares of forest have been conserved with community participation.

Thirty home gardens covering 40 hectares were developed to improve their sustainability of production. Soil conservation was achieved in an area of 60 hectares. Living standards of 50 families were developed due to the improvement of yields in home garden products such as pepper.

About 15 hectares of the watershed were conserved, and their boundaries were demarcated to prevent possible encroachment. This will strengthen the security status of the Kalu Ganga Water Catchment. Conservation of watersheds benefitted 380 families cultivating 24 hectares of farmlands as a result of improved access to water for agriculture and domestic use.

Socio-Economic Impact

Eco-friendly home gardening has become a way of life

The project promoted home gardening benefiting 30 families (18 in Ranamure, 12 in Narangamuwa/Lakegala). Entrepreneaurship development in relation to medicinal products and food items was facilitated for 10 families. Special attention was focused on eco-tourism and related activities involving 10 families (5 – Pitawala and 5 - Ranamure). The quality of life of the community was improved by facilitating their access to water for agricultural and domestic use. These interventions have provided tangible benefits to the community. The farmers benefited from the policy decision taken by the government to ban the import of turmeric to the country. Bountiful harvests of turmeric gave an added income to farmers which improved the household economy significantly. Presently, the villagers earn an income of about USD 76 –157 per month, depending on the parcel size and soil fertility status. As a result of awareness-raising programmes offered to farmers, they have started using new and better agricultural practices. Further, 50 young individuals, including four women, have received training to start their careers as licensed tourist guides.

Youth Engagement and Participation

Young tourist guides trained by the project

This project had both direct and indirect involvement of youth. The beneficiaries of the home gardening programme and the eco-tourism development activities were mainly young people. Selected young leaders played an active role in directing, leading, and communicating activities of the project to others. School children as well as members of local youth organizations were also included in project activities.

Gender Equality and Women Empowerment

Both men and women received direct and equal benefits through the project. Women were the main participants of organic home gardening activities. Notably, four young females were trained as tourist guides. The five women were trained to carry out the production and sale of traditional food products. These women were further strengthened by the formation of a CBO dedicated to the task of manufacturing and selling of food items to tourists and others in outside markets. Two sales outlets were opened at the Laggala Helabojun outlet premises and in the main market in Matale city. According to Dumbara Mithuro, the net profit from each sales outlet was approximately Rs. 2500 per day.

Sustainability

Ensuring the survival and sustainability of plants used for reforestation is a vital task undertaken by the project. According to the agreement made at the beginning of the project, the CBO Dumbara Surakinno has been given the responsibility to replace dead plants. Further, they will maintain the main information boards, stone bunds, and maintain the Pitawala Pathana forest garden located near the ticket counter. The FD is responsible for the guardianship and the conservation of the Pathana.

The project created a website to promote the environmental values and eco-tourism in the area. Also made was a 30-minute video documentary on the biodiversity of the KCF and the activities carried out by Dumbara Mituro. Five hundred copies of this documentary DVD were made. These will be sold to the visitors to the Knuckles area through the tourist centres established by the GEF-SGP projects. A commission will be paid to these centres for selling DVDs.

Training of tour guides and other tourism-related developments were handed over to a CBO formed by the project called Lakegala Sumithuro. This CBO will work with the FD to further promote activities of the project. A new ticket issuing counter being built at the Ranamure Lakegala area will strengthen the financial capability of the CBO.

The five entrepreneurs producing spices and related value added products have been registered. A Participatory Guarantee System (PGS) certificate was obtained for a few authentic organic products in Ranamuregama.

Steps have been taken to allocate a permanent place in the Laggala town for village-based traditional doctors to offer their services to the community, with the support of the Ayurvedic Conservation Council.

Lessons learned

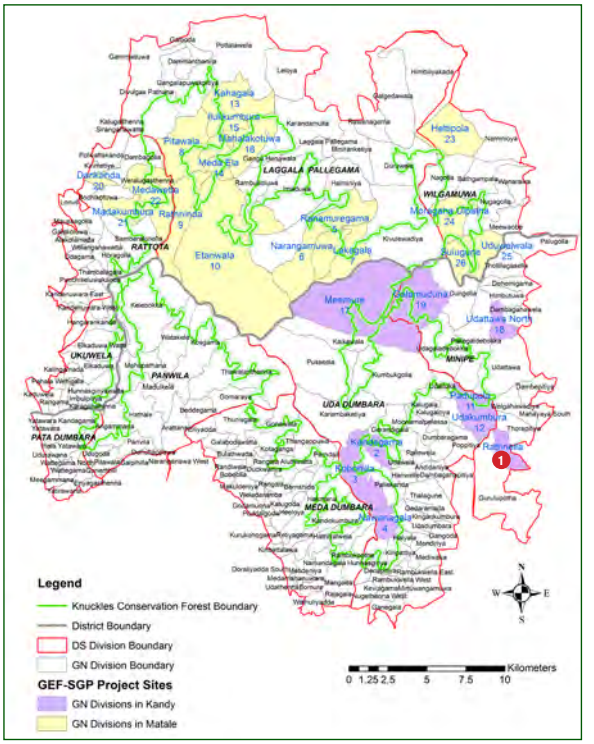
The Easter Sunday terrorist attacks and COVID - 19 pandemic caused a significant drop in the revenue from the tourism industry. The beneficiaries involved in eco-tourism-related jobs were severely impacted. Until tourism recovers substantially, promotion of agricultural activities would be the main livelihood option to the community. Changing of attitudes of farmers towards adoption of sustainable eco-friendly activities in their home gardens has to be considered as the main strategy to be adopted in the project area. Continuous monitoring and guidance for villagers is a prerequisite to achieve desired project outputs.

Collaboration between the project and various government organizations, especially in the agricultural sector, is an essential factor to ensure the success and sustainability of all project initiatives.

Partners

- The FD and the Dumbara Surakinno: Supported carrying out the conservation activities in Pitawala Pathana.
- The Laggala Divisional Secretariat: Played a supportive role when selecting the project site area.
- The Matale District Secretariat: Monitored the project activities.
- The Department of Export Agriculture, Department of Agriculture & Department of Agrarian Services: Conducted awareness sessions, monitored activities and carried out farmer training programmes on GAP for improving productivity in pepper and other crops.
- The Nirmani Development Foundation: Partnered with the project to develop two homestays in the Ranamure and Lakegala areas.
- The FD and Department of Cultural, Tourism, Trade and Commerce affairs of Central province: Conducted training programmes for tourist guides

Development of Eco-tourism with Community Participation in the Rathna Ella Forest Reserve and Rathna Ella Falls



Project No:	SRL/SGP/OP6/STAR/BD/2018/06
Grantee Organization:	National Ethnic Unity Foundation (NEUF)
Address	National Ethnic Unity Foundation (NEUF),Police Quarters Road, Ampara
Telephuone:	077 3265174
Email:	neufampara@gmail.com
Location:	Rathna Ella GN Division, Minipe DS, Kandy
SGP Contribution:	US$ 40,000.00
Cash Co-Financing:	US$ 1,900.00
In-Kind Co-Financing:	US$ 7,900.00
Project Duration:	30 months

Background

Rathna Ella is a picturesque waterfall 101m high, and is the 14th highest waterfall in Sri Lanka. It is located in Hasalaka in the Minipe Divisional Secretariat Division (DSD) in Kandy District. The Hasalaka Oya gives rise to this waterfall located within the Rathna Ella Forest Reserve (REFR) which spans 345 hectares of pristine forest. Hasalaka Oya is the only water source available for drinking and agricultural purposes for about 2000 families downstream. Of late, the village and the waterfall have received a lot of publicity on social media, attracting about 10,000 visitors to the site annually. About 80% of them are local tourists. The increased influx of visitors has posed some threats to this tourist destination in recent times. Visitors often discard non-degradable waste such as empty liquor bottles, plastic containers, polythene sheets, empty cans, etc.

Picturesque Ratna Ella falls

Littering was an eyesore that affected the scenic beauty of the environmentally sensitive area, and caused health hazards to the residents of the Rathna Ella village. In the recent past, many people were injured due to accidentally stepping on shards of glass from broken bottles thrown into the river. Rainwater collected in discarded plastic containers and similar waste material created mosquito breeding grounds.

Before the implementation of the project, visitors used to pollute the stream, the main drinking water source, for the villages in Ratna Ella area. Water-borne diseases became frequent among the villagers due to the consumption of polluted water. In addition to the environmental issues, socially and culturally unacceptable behaviors were noted among youths who visited the site.

At the outset, Mr. B.W. Gunasekara, the head of the National Ethnic Unity Foundation (NEUF), carried out a project to address the issues mentioned above. The NEUF mobilized the villagers to conserve the REFR by forming a CBO called Soba Mithuro of Rathna Ella (Nature's Friends of Rathna Ella). In 2018, Soba Mithuro, with a membership of 37 persons mainly consisting of youth representing the families of the village, was registered officially at the Divisional Secretariat, Minipe.

Project Objectives and Key Activities

The project's main objectives were to conserve the Rathna Ella and the REFR through the empowerment and involvement of the community and to improve the livelihoods of 20 families in the village by developing eco-tourism related income generating activities.

Through the project interventions, a well-maintained and safe vehicle park, toilet facilities and camping sites that cater to the needs of both local and foreign visitors were created. An information outlet was set up to create awareness on the eco-system, its biodiversity, the need for conservation of the pristine environment of Rathna Ella and safety measures to adopt to ensure the wellbeing of the visitors. Services provided to visitors include selling or renting equipment such as boots, torches and ropes needed for hiking. The traditional food outlet located at the entrance to the village was developed and formalized to meet essential standards of quality and hygiene. Two industry-standard homestay facilities were also established.

A waste management plan was developed and implemented with an income-generating opportunity for an individual and the CBO. At present, the volunteers of the CBO collect waste material at the Rathna Ella and the footpath leading to it once a week. Waste bins were also placed in suitable locations.

The villagers felt the need to address important environmental issues caused by visitors, and at the same time, enhance the potential for using tourism as an additional income-generating opportunity. The NEUF mobilized and facilitated the villagers to start small-scale business ventures such as the manufacture of reed crafts, preparation of food items and making of garment products to generate additional income from the tourist visits.

Fifteen families were trained to make organic fertilizer, and traditional rice varieties were distributed among farmers to be used in their fields. The NEUF has also distributed seeds of maize, cowpea and mungbean to promote home gardening and ensure the families' food security. During the Covid-19 pandemic, as the stream of visitors dwindled, the NEUF provided fertilizer, seeds and planting materials to 43 families to start home gardening as an optional livelihood.

Environmental Impact

Organic farming promoted by the project was a relatively new concept for the villagers. The project emphasized organic fertilizer production with the dual objective of safeguarding the environment and promoting eco-friendly farming practices. These activities have helped minimize pollution of soil and water along the downstream area. The use of harmful chemical fertilizers and pesticides that were contaminating the water bodies is expected to drop further with time.

Waste recycling/disposal in environmentally appropriate ways has improved the aesthetic value of the site and eliminated issues causing river water pollution.

The REFR was the primary income source for some villagers engaged in illegal logging, collection of firewood and gem mining. One of the most significant achievements of the project was to reduce the pressure on the conservation forest by developing income-generating opportunities in the village without depleting the resources of the forest.

In 2020, the University of Sri Jayewardenepura carried out water and soil analysis of the entire landscape of the Knuckles range. The idea was to establish the baseline status of soil productivity. According to the results, the nitrate and phosphate contents of the soil were rather low, not quite suitable for growing many crops. This is understandable because of the high rainfall experienced in the area. It is noteworthy that most soil samples collected from the study area were contaminated with the faecal matter, as evidenced by the presence of coliform bacteria.

Socio-Economic Impact

The sale of locally made handicrafts achieved a significant positive impact on the livelihood of the villagers. Proper training on manufacturing handmade items has enabled women to produce items conforming to high-quality standards. It is noteworthy that all five members of one family engaged in pottery making are deaf, and previously had barely managed to eke out an existence. The support given by the project has significantly improved their quality of life.

Currently, 44 individuals are engaged in home gardening, which was introduced as an optional livelihood activity. The women in the village cultivate a variety of root and tuber crops. The newly distributed planting material and training have helped enhance crop yields considerably.

Revival of reed mat making as an added source of income

The project has had a significant positive impact on the lives of the villagers. The women could supply food items and sell crafts to tourists. At present, 18 women and seven men are engaged in small-scale manufacturing of various items such as handmade reed items, terracotta pots and pans, and food items such as traditional rice products, flours of various grains, traditional sweets, jaggery and treacle. Other items sold to tourists include dairy products, paper bags, garments, disposable masks, value-added agricultural products such as chutneys, pickles, sauces, candy, powdered spices, banana chips and yoghurt.

There is a high demand for the traditional rice, and the price is high compared to the newly improved varieties. The income generated is expected to improve further as the country is reviving its tourism.

Before implementing the project, the average monthly income of the villagers was SLR 23,500 (122 US$). Currently, it has almost doubled and stands at SLR 40,000 (207US$, 2021).

Skilled hands turning clay into pots on the wheel

Youth Engagement and Participation

As the project was primarily an eco-tourism development venture, young people were considered as a significant stakeholder category. Currently, about 20 youth are actively involved in the activities of the CBO. The project facilitated the capacity building of youth, enhancing their ability to undertake small-scale business ventures. The project focused on developing the hospitality industry, first aid provision, and managing lodges, car parks, and other facilities by youth participation.

Gender Equality and Women Empowerment

The NEUF has continued to promote the development of self-employment opportunities and small businesses for women. At present, each of the 18 women earns an average monthly income of Rs. 40,000 (207US$, 2021) through their business ventures. Currently, in the backdrop of the almost non-existent influx of tourists, due to the Covid-19 pandemic, these women have started to make disposable masks as an income-generating opportunity.

Sustainability

Currently, the CBO plans to retail all products manufactured by the villagers under a common brand name. This brand name is to be given to all GEF-SGP products in the Knuckles area. The label is expected to have an attractive logo and a tagline to highlight the CBO's social mission. The CBO aims to retail its products to hotels, restaurants, villas, grocery stores, and supermarkets in the Hasalaka and Mahiyangana areas.

It is expected that the self-employed members supported by the project will contribute 5-10% of their income to the fund of the CBO. This fund will be used to ensure the sustainability of initiatives implemented by the project and support the village's environmental conservation and community development activities.

Lessons learned

By providing proper guidance and awareness, communities can be successfully mobilized to carry out project activities. Construction works such as putting up guardrails and small bridges along the foot trail to Rathna Ella inside the REFR to ensure the safety of the tourists were not carried out. The reasons are the lack of proper inter-organization and coordination among the stakeholder institutions and related legal matters. Written approval has to be obtained from the relevant authorities before conducting such activities.

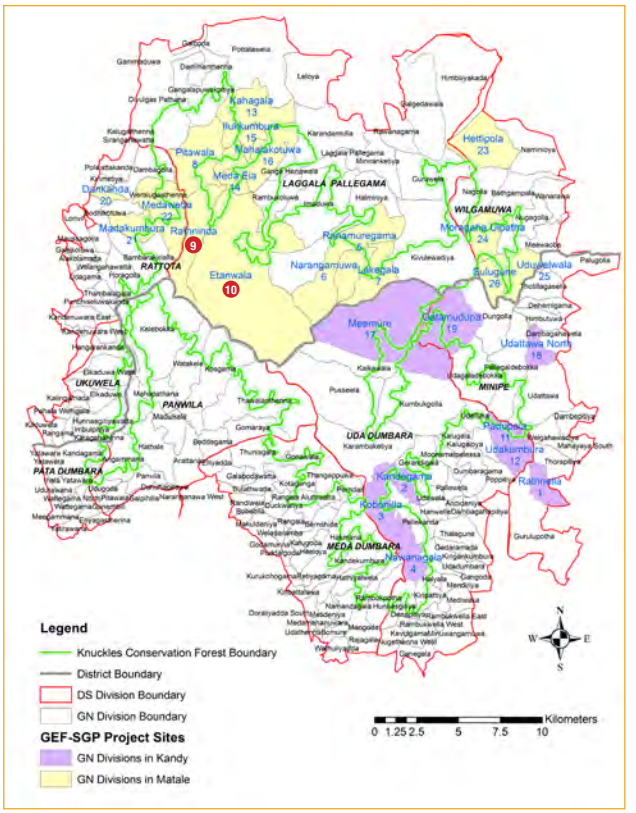
Partners

The Mahaweli Authority (MA): Trained villagers on livelihood development activities and self-employment.

- The MA also contributed 50% of the funds needed to provide sewing machines and other farm equipment to selected beneficiaries.
- The Department of Agriculture: Provided training on organic agriculture to the farmers through the Agricultural Instructors.
- The Forest Department: Proposed to set up a ticket counter at the entrance to the village, formalizing the entry of visitors to the site. Steps have also been taken to minimize illegal activities taking place inside the forest.

Biodiversity Conservation and Land Degradation

Revitalizing the Theligamu Oya Catchment Area and its Residents



Project No:	SRL/SGP/OP6/STAR/BD/2018/10
Grantee Organization:	Arunalu Community Development Centre
Location:	Rathninda & Etanwela GN Divisions, Laggala DS Division, Matale District
SGP Contribution:	$40,000.00
Cash Co-Financing:	
In-Kind Co-Financing:	$95,600.00
Project Duration:	21 months
Focal area	Biodiversity

Background

Rathninda and Etanwala GN divisions in the Laggala Divisional Secretariat (DS) in the Matale District are located alongside the Theligamu Oya, a biodiversity hotspot in the Knuckles mountain range. The richness of scenic beauty has always attracted local and foreign tourists to the project area. The tourism industry is based around various attractions such as the excellent 10 km hiking trail to the Manigala rock and back to the valley, Duwili Ella (10m), Rathninda Ella (6m), Weddapeni Ella (3m) and the abandoned village of Walpolamulla, all located in the Knuckles Conserved Forest (KCF) area.

In the past, the communities living in the surrounding area could depend on the forest for their livelihood without causing severe negative impacts on the environment. Their main source of income was agriculture, where the main crops cultivated were cardamom (*Elettaria cardamomum*) in the KCF and rice cultivation in the village paddy fields. In addition, they also harvested various products from the KCF.

Weddapeni Ella

The increasing pressure of human activities on the forest area and its resources had led to the declaration of the Knuckles area as a Conservation Forest in 2010. After the declaration, all activities conducted previously within the KCF were

banned. The villagers had to subsist on crops grown in 193 ha of uplands and 302 ha of rice fields. Subsistence farming practiced for generations could no longer provide enough food for the villagers. This situation forced them to choose commercial cultivation of selected cash crops such as tobacco, bean and tomato which in turn involved the use of inputs such as pesticides and artificial fertilizers causing environmental pollution, affecting the water quality in Theligamu Oya. The productivity of limited uplands decreased over time as a result of severe soil erosion.

People were no longer focused on sustainable farming practices, and traditional varieties cultivated in the past were lost, leading to a loss of agricultural diversity. The intensive farming practices adopted by villagers have reduced the soil fertility diminishing the harvest and profits earned through agriculture gradually affecting the socio-economic status of the villagers.

It was in this backdrop that Arunalu Community Development Centre (ACDC), headed by Mr. Lional Perera, the project proponent, initiated activities to mobilize farmers from two villages i.e. Rathninda and Etanwala to revive tourism-related activities and improve the livelihoods of the residents. The beneficiaries numbered 80 families with a total of 258 individuals, 128 and 130 females and males, respectively.

The project established a CBO named Etanwala Environmental Association (EEA), with a membership of 40 families to promote eco-tourism as an alternative livelihood option and provide an excellent service to the tourists visiting the area while creating an environmentally-friendly and sustainable source of income. The adverse weather conditions i.e. strong winds in excess of 50 km/h and heavy rains, are serious impediments to conducting any agriculture-related activities in the fields during June, July, and August. Lack of transport facilities and poorly maintained access roads to the villages were serious issues threatening tourism development as a viable industry.

Project Objectives and Key Activities

The main objectives of the project were to:

- Introduce sustainable land management practices to enhance the productivity of farming
- Conserve and enrich agricultural diversity
- Conserve the biodiversity in the Theligamu Oya catchment area
- Facilitate the development of eco-tourism for sustainable livelihood development

Stone Bunds: a lasting solution to a perennial soil erosion problem

At the outset, the village community was mobilized to form a CBO. This was achieved with the assistance of government officials who briefed the villagers on expected project activities and potential benefits.

In line with the project objectives, officers from the Department of Agriculture (DOA) and the Sri Lanka Hadabima Authority conducted preliminary training for farmers on Soil Conservation. Implementation of soil conservation activities in the field was conducted under the guidance and support of Agriculture Instructors of the DOA of the area. The CBO members successfully established 2200 m of stone bunds, 25 m of lock and spill drains and check dams along 1100 m length in water streams. The project also established 650 m of live fences using Sloping Agricultural Land Technology (SALT). The total area under soil conservation was 84 ha and 36.5 ha in Rathninda and Etanwala, respectively. With community participation, the project planted 6000 seedlings of native trees such as *kumbuk (Terminalia arjuna), mee (Madhuca longifolia), and karanda (Pongamia pinnata)* in a 7 km stretch of land along Theigamu Oya and its watershed. Once established, these trees will improve the quality of the watershed of Theligamu Oya. Also planted were 2000 seedlings of jak (*Artocarpus heterophyllus*), covering an area of 200 ha in both villages.

Before launching the project, home gardening was carried out in both villages on a small scale. Due to severe soil erosion, the home garden never produced enough to cater to the household's needs. The project addressed this issue by using three

important strategies i.e. provision of training to farmers on modern sustainable farming practices, providing good quality seeds and planting materials and tools used for home gardening. Home gardening tools, plants and seed packs were provided to 80 families in both villages. Planting material distributed included 2250 vines of pepper, seedlings of king coconut, lime, sweet lemon, etc. The project also established a 2-hectare model farm to popularize the cultivation of traditional rice varieties among farmers.

Good agricultural practices in the home gardens

Minimizing hazards to humans as well as animals and soil microbes was accorded high priority by the project. Accordingly, an awareness programme for safe handling of pesticides and disposal of pesticide bottles/containers was conducted for villagers in collaboration with officers of the Registrar of Pesticides (ROP) of the DOA. Ten barrels were placed in appropriate locations to facilitate the process of collecting used containers of pesticides for safe disposal. Farmers were also trained to control Giant Africana Snail (*Achatina fulica*), which is a severe constraint to home gardening in Etanwala.

Dry climatic conditions with the strong wind occurring during June to August months and limited land space for cultivation were the main barriers to home gardening. Therefore, under this project, better irrigation systems, bedding methods and the *Wagamalu* and *Waga Kulunu* methods used to grow vegetables vertically using bamboo structures were introduced for home gardening. These new home gardening methods have provided a solution to the problem of shortage of land available for cultivation of home garden crops.

Women participants of a traditional food production demonstration

Picturesque sites, traditional food and peaceful village scenery have always attracted tourists to this area. Thus, there is a considerable potential to develop eco-tourism in the project area.

Ten families were supported to provide services to tourists. The project renovated 130 m of the stone-paved pathway in the trail to the Duwili Ella falls. Four sanitary facilities and a car park were constructed for the benefit of tourists. Apart from that, a camping site was a established for the tourists for resting and cooking meals. Some of the beneficiaries were trained on proper maintenance of homestays by the Central Province Tourism Board and were facilitated to develop their homestays and to fix display boards to attract tourists. Under this activity, nine homestays and food outlets in the two villages, namely Shantha Holiday House, Manigala View, Nature Foods, Riverston View, Handiya Kade, Etanwela Gamigedara, Kethyaya, Thuru Sewana and Thuru Mansala were developed with improved sanitary facilities, dining facilities and safe vehicle parking. One homestay is currently being improved with financial assistance of the project. The project assistance amounted to 50% of the funds required to upgrade it. Essential

equipment was provided to other homestays. A group of 22 women was trained on preparation of traditional food items by the instructors of Hela Bojun Division of the Department of Agriculture.

A hut and a buffet set were provided to the CBO for use during public ceremonies and other important functions. An awareness session was conducted for the villagers on dental diseases, and a dental clinic was conducted for the benefit of school children of the Mahalakotuwa school.

Environmental Impact

In the past, the farmers carried out their commercial vegetable cultivations using large amounts of agrochemicals, expecting a better harvest. The community was mobilized to minimize the excessive agrochemical usage in farm plots located within the delicate ecosystems in the catchment areas of the Theligamu Oya. As a result of the project interventions, crops are now grown using very low amounts of agrochemicals by following Good Agricultural Practices (GAP). Therefore, these delicate ecosystems will be less contaminated, ensuring their long term conservation. The project's waste collection and management systems have significantly reduced environmental pollution caused by tourists.

The villagers are expected to multiply their seeds and planting material for use in the long term. The agricultural diversity is expected to expand while minimizing soil erosion would result in obtaining better crop yields in the home gardens.

Socio-Economic Impact

The project undertook several livelihood development activities for the benefit of the community. Special attention was focused on improving the eco-tourism sector with training, capacity building and facilitation. Eco-tourism was promoted as a main income generation venture.

Giant Africana Snail, as a pest, was responsible for destroying seedlings of vegetable crops grown in the home gardens. With the effective management of this pest, the quality and quantity of marketable vegetable crops have increased while the cost of cultivation has reduced significantly.

Traditional rice cultivation, which has a very high market value, was also promoted. The project built capacities of farmers for enhancing their income generation capacity. The beneficiaries have started to manage their cropped land better and are better equipped to handle problems related to adverse effects of climate change. Higher crop yields are expected to supplement the dietary requirements and enhance the farmer's income. The average monthly income of

the community was about Rs. 10,000 (USD 54, March 2021) and Rs. 11,250 (USD 58) in 2019 and 2020, respectively. A distinct improvement in income generation cannot be observed owing to the collapse of the tourism industry in Sri Lanka as a result of the Easter Sunday attacks and the COVID-19 pandemic. However, the communities have managed to survive through both these situations in spite of cessation tourism-related activities. The nutrition status of the villagers has improved due to improved productivity of crops grown in the home gardens. The dental clinics for school children have proved to be a complete success. Children having serious dental problems were referred to the Kandy Hospital for further treatment.

Youth Engagement and Participation

Capacities of 21 young tourist guides, both male and female, were developed to handle various aspects related to environmental and biodiversity conservation and provision of first-aid. Skills development was emphasized to improve the guides' ability to cater to diverse needs of the tourists. An identity card, specially designed T-shirts, raincoats and boots were provided to all tour guides.

Equal rights and opportunities were availed to the youth in decision making in the CBO. Further, they receive priority in sharing project benefits by way of capacity development and taking part in livelihood development activities.

Gender Equality and Women Empowerment

At present, the main income generation activity of the village is eco-tourism, where both men and women are participating equally and receiving direct and equal benefits. Sixty-nine women are engaged in crop husbandry, and 47 women are providing services related to eco-tourism introduced by the project.

Project activities are managed by a council that consists of 12 community members. This council has equal representation of both females and males. Females have an equal opportunity to make decisions. Hence, both genders enjoy an equal level of empowerment. As a livelihood development initiative, women were encouraged to prepare traditional food items for sale to tourists.

Sustainability

In both Etanwala and Rathninda villages, the CBO has been very active in ensuring the capacity development of villagers as well as community leaders. Motivating people to adopt environmentally-friendly and sustainable farming methods has been emphasized by the project. The result is that farmers have begun to reap the

benefits of increased productivity in agriculture. Identification and adoption of new avenues for income generation have raised hopes of surviving hard times and adverse weather conditions. It is easy to visualize a future where more youth and village elders will join hands to conserve the environment and improve the livelihood of the entire community.

It is envisaged that the community members supported by the project would contribute 3-5% of their monthly profit to the EEA to ensure the continuation of activities in the long term. In future, the EEA will commence operations as a cooperative society which in turn will be able to draw from the strength of a larger cooperative society of a division consisting of several villages. This move will further strengthen the management of the CBO and facilitate opening up of new avenues for marketing products or services under the supervision of the Department of Cooperative Development.

The licensed tour guides trained by the project will continue to support project initiatives by attracting tourists to participate in tree-planting campaigns, where the tourists will purchase plants from a nursery for a small fee. The tourist will have the pleasure of having planted a tree at a location indicated by the project staff. The money earned will be used to produce more planting material and maintain established plants.

A sales center will be established to market various local fruits, vegetables, grains and value-added products to local and foreign tourists. A part of the profit earned will be credited to the CBO's savings to support further expansion of project activities.

Lessons learned

The economic downturn caused by the pandemic has lessened the enthusiasm of the members of the CBO to adopt initiatives with long term prospects. It has become abundantly clear that activities that can provide short term benefits would have to be coupled with more long term income generating opportunities. Failing to do this would drastically reduce the attractiveness of such initiatives. For example, villagers would be happy to receive planting materials and seeds that will produce a marketable product within a short period, which would be more desirable than a tree that would take years to grow.

The giant snail controlling methods introduced to the community have proved successful and can be used in other areas having similar conditions.

The government's drive to promote organic agriculture can be effectively used to strengthen ongoing activities being operated in home gardens and rice fields.

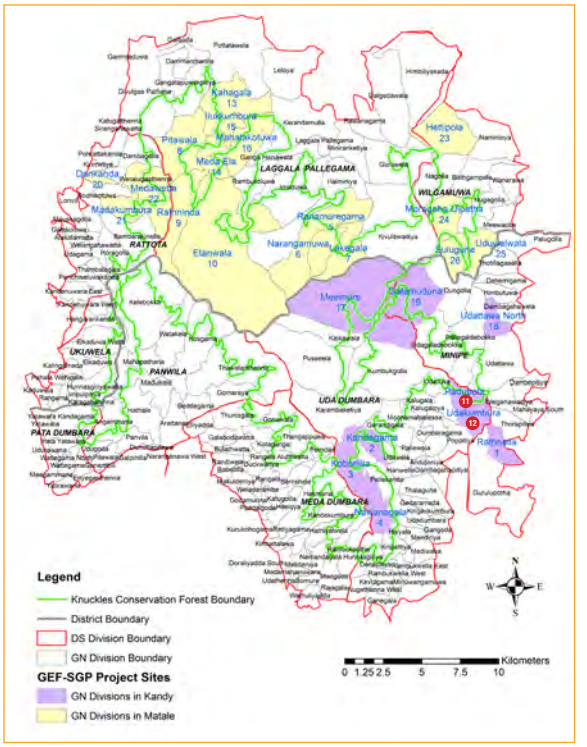
The promised incentives to growers of organic produce and producers of organic fertilizer could be strategically used to further strengthen the CBO.

Partners

The partners and their contributions are listed below:

- The DOA and the Hadabima Authority: Training farmers in the areas of Soil conservation, Good Agricultural Practices (GAP) and conducting excursions to the Agricultural Technology Park, Gannoruwa.
- The Forest Department: Distribution of forest plants for the watershed area and home gardens
- The Divisional Secretariat of Laggala: Monitoring of project activities and encouraging farmers
- The office of the Registrar of Pesticides: Introduction of new and safe methods for the use of pesticides for controlling invasive species and safe disposal of empty pesticide bottles
- Science Alumni Association of University of Peradeniya: Conducting a dental clinic for school children in the area
- Board of Tourism of the Central Provincial Council, Rajarata University, Forest Department, and Dumbara Mituro Environmental Organisation: Training of eco-tourist guides
- The Traditional Foods (Helabojun) Division of the DOA: Training on preparation of traditional food items and value addition.

A Welcome Change to Padupola and Uda Kumbura Villages



Project No:	SRL/SGP/OP6/STAR/LD/2018/24
Grantee Organization:	Community Development Centre (CDC)
Address	Alakoratuwa, Attapitiya, Ussapitiya.
Telephuone:	035 2248753/ 071 8110710
Email:	dgodamulla@gmail.com
Location:	Padupola, Udakumbura GN Divisions, Udu Dumbara DS Division, Matale District
SGP Contribution:	US$ 30,000.00
Cash Co-Financing:	
In-Kind Co-Financing:	US$ 32,800.00
Project Duration:	34 months
Focal Area	Land Degradation

Background

Padupola and Uda Kumbura are two Grama Niladari Divisions (GNDs) in Ududumbara Divisional Secretariat Division (DSD), located in the buffer zone of the Knuckles Conservation Forest (KCF), having a population of 756 in 170 families. The main income source of the villagers is rain-fed rice cultivation in terraced fields, vegetable cultivation and pepper in the home gardens. They also cultivate a few other field crops with limited success. Common problems plaguing the KCF area are found in these villages as well. These include intense soil erosion with ensuing loss of fertility, diminishing crop yields, human-elephant conflict and poor market access. Rice and vegetable cultivation have continued to give diminishing returns as the farmers have to depend on inputs such as agrochemicals to make ends meet.

Mrs. Damayanthi Godamulla led the Community Development Centre (CDC), an NGO, to solve the farmers' most important problems. These farmers lacked the technical knowhow to practice agriculture profitably, and had no bargaining power to deal with the middlemen to whom they were forced to sell their produce. The CDC emphasized organizing farmers into a CBO called Padupola Udukumbura Praja Sanwardhana Samithiya to empower them and improve their livelihood options. The total number of families who came together to make this possible was 63.

Project Objectives and Key Activities

The project's main objective was to promote sustainable agricultural practices to prevent further land degradation, improve farmers' access to outside markets and enhance the household economy by using a variety of interventions.

Mainly live fences using Sloping Agricultural Land Technology (SALT) were promoted as soil conservation measures. Gliricidia sepium was the trellis for pepper vines, and farmers were advised to apply loppings of these plants as green manure for crops. Further, composting was promoted to minimize chemical fertilizer usage. This activity was made possible by the training given by outside experts who conducted 30 training programmes.

Programmes have been implemented to improve the productivity of spice crops such as cinnamon, pepper, vanilla, turmeric and ginger cultivated in the home gardens. Cultivation of several varieties of roots and tubers was introduced, and planting fruit trees was promoted to improve the nutrition status of villagers and generate income from the sale of any excess. Planting material was distributed to farmers from 82 families. A group of farmers visited the Agrotechnology Park,

Gannoruwa, Peradeniya, and participated in a training programme on Good Agricultural Practices (GAP) for potential entrepreneurs. Some home garden cultivators faced water scarcity for cultivating commercial crops of high value. The project supported such farmers by providing PVC storage tanks.

A homestead with live fences to conserve the soil

Two proud recipients of water tanks

Villagers posing in front of the newly built guardroom

The CDC trained women on making food products using selected underutilized crops and adding value to pepper, turmeric and other spice crops and marketing channel development. Expert advice on producing quality pepper and packaging was made available to farmers. Paraphernalia needed to tap inflorescences of

fishtail palm was issued to seven families. Also, the CDC gave ten grass trimming machines to the CBO to control grasses without resorting to use of herbicides. As mushroom cultivation is a profitable venture which requires only a minimum of initial investment, it was promoted among four families. Essential tools and equipment were issued to women engaged in this cottage industry.

A 4 km long electric fence which had become dysfunctional over time, and was not successful in preventing elephants from entering the villages was repaired. The guardroom too was dilapidated and unusable. This too was duly repaired, and a 10m wide fire belt was set up to prevent large-scale bush fires from spreading to the KCF.

Several small-scale seed banks were established in home gardens to conserve crop genetic diversity. The CDC provided expert advice to farmers on maintaining and operating of these seed banks.

The laborious work of establishing stone bunds in home gardens

Difficulty in commuting to the project areas was one of the challenges faced by the project staff. Covid-19 impeded several project activities such as monitoring and providing guidance to farmers. Weather conditions such as heavy rain and wind too affected initiating project activities.

Environmental Impact

The soil conservation measures implemented by the beneficiaries have conserved more than 500 hectares. Soil enrichment and increased crop yields can be expected as long-term benefits of this activity. Training and awareness creation

workshops were essential to convince farmers to adopt eco-friendly cultivation practices. Currently, 63 families have started making compost. Turning towards compost and minimizing weedicide usage would help improve the soil's water-holding capacity, enhance fertility and facilitate the proliferation of beneficial soil microflora and fauna.

Women hard at work clearing the electric fence line

The project planted 1000 fruit trees and other plants such as jak, mango, areca nut and fish tail palm in the land areas bordering the KCF and watershed areas. Also planted were 1000 commercial crop plants (pepper, cinnamon and vanilla) in home gardens. The project also introduced eight yam varieties that were no longer found in the area.

The ever-present danger from elephants invading both the villages was a serious threat to human lives as well as crops. The renovated electric fence and the fire belt prevent the intrusion of elephants into the village and farmlands. The fire prevention belt is a component of the master plan of the Forest Department (FD). Humans, elephants and the villagers' properties have been protected as a result of this activity. The fire belt established along the electric fence protects the forest and farmlands from the spread of frequently occurring wildfires.

The project believes in the capacity development of farmers, enabling them to multiply seed and planting materials needed for future use.

Socio-Economic Impact

The rehabilitated homesteads were utilized for growing cash crops, vegetables, traditional fruit crops and yam varieties. These cultivations provide substantial economic gains to the communities.

Damage to crops and property of the villagers by elephants was effectively stopped after the restoration of the electric fence. The productivity of seasonal crops such as finger millet, cowpea and groundnut has significantly increased in the year 2021.

Pure jaggery and treacle from the sap of the fishtail palm fetch a high price in the outside markets. Of the 17 farmers engaged in this cottage industry, nine have made significant improvements to their household economy by accessing outside markets. Further, nine others have started processing spice and/or mobile trading.

Capacity development of community members was carried out with regard to improving leadership and entrepreneurial skills. The average monthly income of the beneficiaries before project implementation was Rs. 20,600 (USD 106, March 2021), and at present it is Rs. 28,000 (USD 145) with an increase of Rs.7390 (USD 38). It is expected that new employment opportunities and development of entrepreneurs would gradually increase with time.

Table 1 : Pre- and post-project average monthly income of the entrepreneurs

No.	Entrepreneur Type	Average monthly income before project implementation (Rs.)	Average monthly income after project implementation (Rs.)
01	Chilli powder and mushroom producers	10,000 (USD 52)	25,000 (USD 130)
02	Food sellers	8,000 (USD 42)	24,000 (USD 124)
03	Fishtail palm-based produce manufacture cum seller	25,000 (USD 130)	40,000 (USD 207)

Youth Engagement and Participation

In the beginning, youth involvement in project activities was not very satisfactory because most young people had migrated to outside areas in search of a better life. With the advent of the project, some youth have come back and commenced cash crop cultivation, value addition to agricultural products and selling spices and fishtail palm based products. An awareness programme was also conducted for children from 63 families.

Gender Equality and Women Empowerment

Both men and women have started to benefit from the project in equal measure. Women had taken the lead role in conducting many project activities. The CDC supported ten women entrepreneurs who have commenced making value-added spice and food products.

The range of value-added products available for sale

The project leader has set an example for other women to occupy leadership roles. Several female field officers were appointed to conduct the selected project activities and to encourage women to participate in project activities.

Sustainability

A CBO was established in the two villages, and the sustainability of the project activities was ensured through it. The capacity of this CBO was improved, and ten community leaders were identified to work with the CDC to sustain project activities. Another CBO will be established with the participation of 35 individuals to maintain business links with the CDC. It will provide opportunities to sell farmers' agricultural produce profitably, and in addition, develop small-scale businesses.

The CDC facilitated coordination between government officials and villagers to ensure the smooth functioning of project work. Currently, several young leaders are engaged in implementing new marketing strategies.

A mechanism has been developed to maintain the electric fence and the fire belt. A village committee will carry out elephant fence maintenance in collaboration

with the Department of Wildlife Conservation (DWC). The electric fence is being managed according to the DWC technical guidelines. The Forest Department has now assumed the overall responsibility for the fence.

Trained farmers have started to produce quality agricultural products. They have formed small business units. Some previously established small businesses which were functioning somewhat ineffectively were supported to improve their revenue. The use of better marketing strategies has enabled and increase in sales volumes and profits, indicating that it is possible to envisage better times ahead.

Lessons learned

Although project activities have been completed, beneficiaries would need further assistance to improve their livelihood options opened to them by the project. New leaders should be identified and trained for implementing new marketing strategies. Coordination between government officials and villagers needs to be further strengthened to receive the maximum benefits from project activities. Availability of knowledgeable field officers with good communication skills would be an essential requirement to maximize the benefit from project activities.

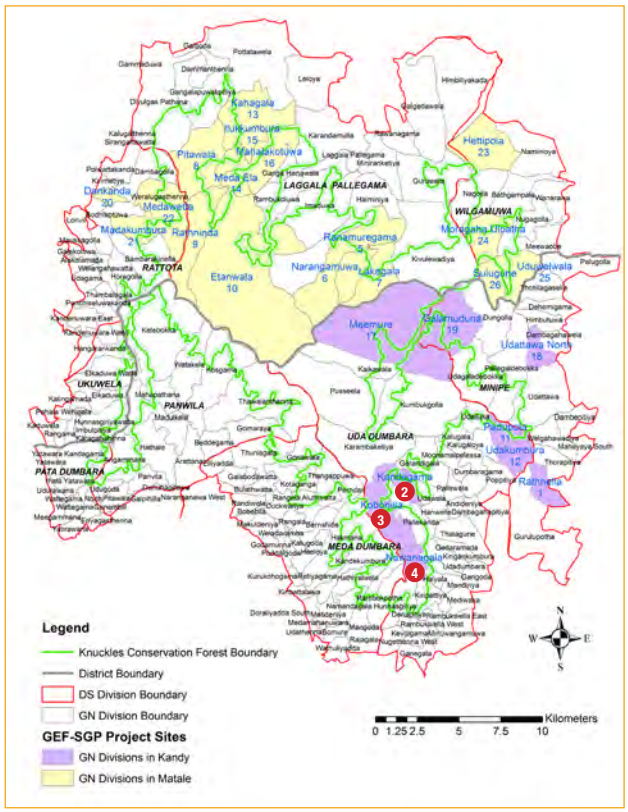
The pre-feasibility stage is critical to identifying main issues in a project area. The successful completion of this stage would make it possible to ensure high levels of sustainability of projects. For example, the human-elephant conflict was an important issue in the project area, but it did not become evident at the beginning of the project. This situation was subsequently identified and resolved. The learning point was that in-depth feasibility studies are an essential requirement to save both time and money in implementing projects.

Partners

- The FD, Officials of the Ududumbara Divisional Secretariat (Development officer, Grama Niladhari Officer, the Agricultural instructor and the Cooperative Officer, the Economic Development officer) and community leaders: Participated in project planning and execution and trained villagers on improving crop productivity
- Officers of the Agrotechnology Park, Gannoruwa: Conducted a training programme on Good Agricultural Practices for potential entrepreneurs.
- Gemi Seva Sevana, Galaha, with an independent consultant: provided the technical knowhow on soil conservation.

- The Department of Export Agriculture, Matale and Kandy and the Small Business Development Division of Divisional Secretariat of Ududumbara and Peoples' Livelihood Development Foundation, Ehaliyagoda: Provided training and tools for use in fishtail palm tapping.
- The FD: Partnered for repairing the electric fence and establishing the fire belt.
- Sri Lanka Environment Exploration Society (SLEES): Provided financial support to establish the fire belt along the electric fence.
- Good Market: Motivated the community to produce value-added food products.

Reviving the Ecosystem and Enhancing the Livelihood of the Residents of Kandegama, Kobonilla and Nawanagala



Project No:	SRL/SGP/OP6/STAR/BD/2018/07
Grantee Organization:	Centre for Integrated Indigenous Knowledge Systems (CIIKS)
Location:	Kandegama, Kobonilla and Nawanagala GN Divisions, Udu Dumbara DS, Kandy
SGP Contribution:	$40,000
Cash Co-Financing:	
In-Kind Co-Financing:	$63,350
Project Duration:	30 months
Focal Area	Biodiversity

Background

Kandegama, Kobonilla, and Wadawalakanda are three adjacent GN divisions located in one of the most picturesque areas of the Knuckles mountain range in the Ududumbara Divisional Secretariat in the Central Province of Sri Lanka. About 330 families reside in these villages.

Consequent to banning of cardamom cultivation, which was the villagers' main livelihood in the past, the villagers were forced to eke out their livelihood by harvesting resources from the surrounding forest and practicing *hena* (Slash-burn agriculture) cultivation. Forest fires became frequent as some villagers deliberately set fire to the forest for poaching and clearing land for crop production. Strong seasonal winds usually occurring from May to August make it challenging to carry out agriculture-related fieldwork. Farmers also experience severe difficulties due to monkeys that cause heavy crop loss. Human activities posed a threat to the biodiversity of the fragile ecosystem. The villagers themselves were hard put to produce enough from their agricultural activities due to land degradation and pest attacks.

In this backdrop, Mr. I.G.S Jayasooriya, Chairman of the Centre for Integrated Indigenous Knowledge Systems (CIIKS), supported by a CBO named Kandegama Shrama Shakthi Samithya (KSSS), sought to address the issues of conserving the biodiversity of the KCF and promoting alternative livelihood options to affected villagers.

Project Objectives and Key Activities

The project's objectives were to conserve the biodiversity of the KCF and its buffer zone by minimising the occurrence of forest fires and preventing further land degradation while promoting sustainable livelihood development options to the communities in the Kandegama and Kobonilla villages.

During the initial stages of the project, high priority was given to restoring a fire belt, 6.5 km long and 6m wide, to prevent the uncontrolled spreading of fires originating from the side of the Hare Park Estate to adjacent forest above the estate. This fire belt established by the Forest Department (FD) was not sufficient to prevent the spread of forest fires due to the presence of fast growing grasses. When dry, these grasses are highly flammable. The strategy used to address the issue of uncontrolled fire was two-fold: a) to clear the vegetation in the fire belt and b) to plant a fire-resistant plant species. Both tasks were duly accomplished. The clearing of the belt was carried out with community participation, and about 9000 *Agave vera-cruze* plants were planted, covering a stretch of about 6.5 km

along the fire belt. Here, since smaller agave plants did not survive, planting larger plants was recommended.

Measures were also taken to prevent or minimise the occurrence of forest fires in future by giving this responsibility to three newly formed committees that would collaborate with the FD. In future, these committees will alert the relevant authorities in case a forest fire should happen. In addition, the community was given training on controlling and extinguishing forest fires with equipment issued to them by the project. Children of the Nawanagala School played an important part in creating awareness of the negative impact of forest fires. About 100 children took part in an art competition on the theme of "The negative impact of forest fires on the environment".

Some participants of the tree planting programme

The other activities emphasised reforestation of denuded patches of land in and around the Kandegama village. The stream banks were strengthened by planting 1500 *Kumbuk (Terminalia arjuna)* seedlings. About 1500 areca nut *(Areca catechu)* plants were established in the homesteads and other agricultural lands. Many useful native plants such as *damba* (*Cleistocalyx nervosum*) and *karanda (Pongamia pinnata)* were established in the watershed areas of the KCF. Altogether, 3000 trees were planted in the watershed area of the Hare park reserve. As a strategy for preventing raids by monkeys that destroy crops, 120 mango trees (*Mangifera indica*) and 500 jak trees were planted along the boundary of the forest and the Kandegama village.

In both Kobonilla and Kandegama villages, off-farm and on-farm soil conservation activities were launched to minimize erosion. Awareness and technical know-how had to be given to the community so that their efforts would produce the desired effect of reducing soil loss and facilitating the safe conduct of run-off down the slope. Accordingly, training on soil conservation was provided to 60 farmers. The villagers constructed a total length of 1500m of soil bunds/ stone bunds and 400m of lock and spill drains, including off-farm soil conservation along roads. Another 5000 plants were planted as a wind barrier.

Soil conservation activities in progress

Multiple options were explored to evaluate the villagers' ability to generate income during both cropping seasons as well as during the off-season. Particular emphasis was placed on improving the productivity of tapping fishtail palm (*Caryota urens*), beekeeping, organic farming and the production of traditional food items and beverages. Five villagers were trained on tapping of fishtail palm to produce treacle and jaggery. Adding value to these products by improving packaging and using the correct marketing strategies have made it possible for people engaged in this trade and make a higher profit from the sale of the finished product. Both these products enjoy a high demand for the production of traditional sweetmeats even in the village itself.

The sap of the fishtail palm is often drained by monkeys who love its sweetness and the intoxicating effect of the fermented juice. Thus, in the past, raids by monkeys seriously affected the productivity and spoiled the sap quality. The project introduced a metal cage to deter any attempts by monkeys to access the collected sap. Six such cages were provided to farmers to determine the effectiveness of using this strategy. These contraptions have proved their worth by improving the productivity of sap harvest.

Means of protecting tapped fishtail palm inflorescences from monkeys

Villagers being trained on good agricultural practices

The CBO made arrangements with a disabled woman operating a sales outlet of traditional products to enable the villagers to sell their produce. The location of this sales outlet is frequented by tourists and other visitors to Meemure.

The project carried out several activities to promote the productivity of agriculture by emphasising awareness creation and training on GAP, cultivation of cash crops, safe use of pesticides and apiculture. The project provided an opportunity to 60 farmers to visit the Agro-Technology Park, Gannoruwa. Farmers were trained on organic agricultural practices, including the production of organic fertilizer. Further, 81 farmers were trained on GAP, including the proper use of pesticides, and 100 farmers were trained on pepper cultivation. Three thousand pepper plants distributed among them were planted in 6 ha. Moreover, 20 farmers were trained on beekeeping. They were given bee boxes.

Seven hoardings displaying important messages on environmental conservation were fixed along the Hunnasgiriya-Meemure road and the Dothalugala nature trail. Moreover, promotion of tourism was carried out by launching a website (https://c4iiks.com)

Two health clinics were organized with the participation of 240 villagers to facilitate health promotion and disease prevention as the villagers do not seek proper medical care due to transportation difficulties and poverty. The water quality of five sources in the area was tested. A degraded 4 km long nature trail was restored to facilitate eco-tourism in the two villages.

Environmental Impact

The reforestation programme covering a total area of 70 ha has effectively increased the area's biodiversity, prevented soil erosion and enhanced seepage of water into the soil, creating an environment conducive to ensuring the proliferation of many native plant species. The increased availability of non-

timber forest products has made it possible to generate an additional income from land adjacent to the villages while minimizing the pressure exerted on the conserved forests. Arguably, the most significant impact has come from the prevention of spontaneous or man-made forest fires. The soil conservation measures have minimised the soil loss and enabled the run-off to flow into the streams with minimal soil disturbance.

Socio-Economic Impact

The total number of direct beneficiaries of this project was 186 individuals. The project promoted and facilitated income-generating activities such as home gardening, producing high-quality fishtail palm-based products (treacle, jaggery and flour), pepper cultivation and other household small-scale self-employment ventures. The income of 68 families has improved as a result of the project.

The fishtail palm has always provided multiple benefits to the community as it thrives in the forest area and the home gardens as well. Farmers produce about 60 kg of fishtail palm flour per month. Starch extracted from the pith of the fishtail palm was traditionally achieved by pounding the pulp manually or by transporting logs to the Teldeniya Town located 40 km away. Manual extraction of starch was strenuous while transporting logs to the town involved incurring an additional expenditure. The use of a machine for pulp extraction has made it possible to save money previously spent on transporting logs. Additionally, employment for three villagers has been created.

The fruit tree planting programme may take a few more years to provide tangible benefits. Once these trees start bearing fruit, the monkeys will no longer need to cause damage to crops as the mangoes are much more desirable to them. This is a long-term humane solution to a long-standing problem. The villagers may also harvest some of the fruits for their consumption.

The health clinics have made it possible for the villagers to seek relief for a variety of complaints. Some individuals who had non-communicable diseases but were unaware of the situation were directed to the Theldeniya District Base Hospital for further treatment.

Youth Engagement and Participation

All major project activities such as planting and maintaining trees, clearing and maintaining fire belts, installing notice boards and hoardings with messages relating to environmental protection, and organising medical clinics were carried out with the direct involvement of the youth. The Environmental Protection

Action Group activists are also youths. They are also actively engaged in educating various members of the community on matters relating to environmental conservation.

Gender Equality and Women Empowerment

Both men and women have contributed equally to ensure the success of all project activities. Women are directly involved in producing various items from local resources and selling such items to tourists and visitors to the area. Altogether, there are over 100 women who have benefitted from project activities and it is important to note that the sales centre for fishtail palm products is run by a visually impaired woman. The knowledge imparted to the community on value addition and marketing of products is being put to good use to generate an additional income.

Sustainability

The main aim of conducting training programmes was to conserve soil and biodiversity, get farmers to use sustainable agricultural practices such as organic farming. Further, the project sought to promote livelihood options available to farmers such as pepper cultivation, jaggery production and home gardening. Preventing the spreading of uncontrolled fires was also an important project objective. This responsibility is currently vested with an CBO named The Environmental Protection Action Group. The project introduced *Agave cantala*, a plant suitable for preventing spontaneous fires from spreading across fire belts to engulf a whole forest in a short time.

This plant also has other benefits to offer to the community. A company which manufactures handbags trained five individuals on processing of Agave leaves to extract its fiber. This fiber can be sold as a raw material or be used by the villagers to make various handicraft items. The objective of this activity was to promote the use of use Agave in the fire belt and in addition provide a livelihood development option.

A CBO named Kandegama Shrama Shakthi Society has made it possible to improve the household economy by supporting project activities related to selling various products such as fishtail palm treacle and flour.

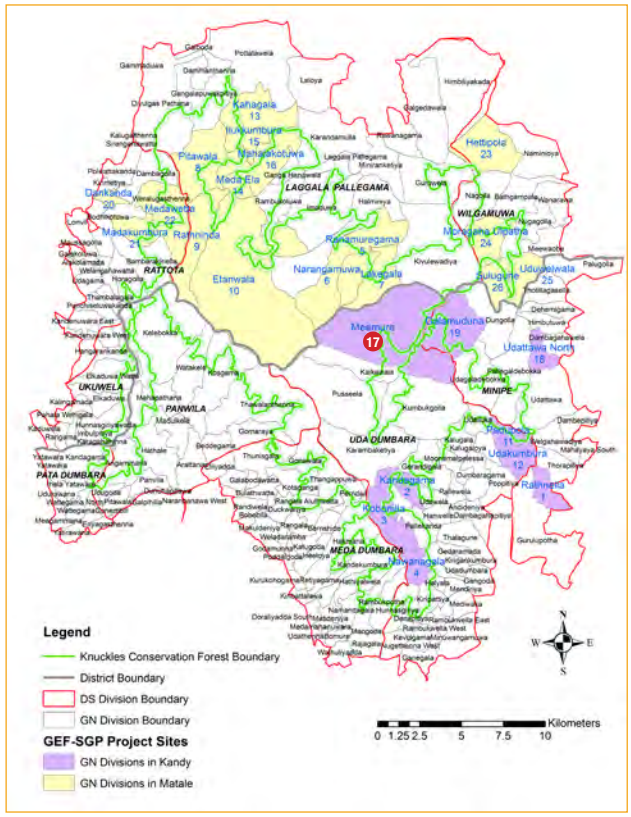
Lessons learned

- Maintaining the fire-resistant plants in the firebelt was a problem due to the heavy damage caused by porcupines. The learning point was that only mature hardened plants with thorns need to be planted in the future.
- Certain technical difficulties related to beekeeping will have to be resolved in relation to determining the carrying capacity of the locality. This aspect needs further study before trying to promote apiculture on a wide scale.
- The metal cage developed to prevent fishtail palm sap being drained by monkeys has proven to be very effective. The pith-scraping machine used to extract fishtail palm starch has also proven its worth as a means of reducing the tedium of the process. These are very useful innovations that can be successfully adopted in areas where fishtail palm is grown extensively.

Partners

- The Forest Department: Provided necessary approvals, resource persons for training programmes, tools for controlling fires, and issued plants for reforestation.
- The Department of Land Use Policy Planning of the Matale District Office: Provided training on soil conservation practices
- The Divisional Secretariat of Ududumbara: Provided essential tools for eight fishtail palm tappers and trained the staff of the CBO on maintaining accounts
- The Department of Export Agriculture, Matale: Trained 100 farmers on pepper cultivation.
- The Bee Resource Centre, Kundasale: Trained 20 farmers on beekeeping and provided bee boxes.
- The Theldeniya District Base Hospital and Theldeniya Ayurvedic Medical Centre: Conducted two health clinics.
- The Department of National Livestock Development, Beligama Farm, Matale: Supported the farmers by providing chicks and pens for raising them.
- The Office of the Registrar of Pesticide: Provided training on the proper use of pesticides.
- The Department of Agriculture: Provided training on Good Agricultural Practices.
- Kantala (Private) Limited (www.kantalabrands.com): Trained five individuals on processing of Agave leaves to extract its fibre. It also purchases extracted fibres.

Transforming Meemure into a Thriving Eco-tourism Destination



Project No:	SRL/SGP/OP6/STAR/LD/2018/21
Grantee Organization:	Community Resource Protection Centre (CRPC)
Location:	Meemure GN Division, Uda Dumbara DS Division, Matale District
SGP Contribution:	$30,000
Cash Co-Financing:	
In-Kind Co-Financing:	$84,600
Project Duration:	24 months
Focal Area	Land Degradation

Background

Meemure, a village located in the Udadumbara Divisional Secretariat in the Kandy District, has a population of 115 families with 327 individuals. It is situated at the foothills of Lakegala, one of the most remote but picturesque areas of the Knuckles Mountain Range. It has a rich history that dates back to many centuries. Farming has always been the main source of income for villagers. They traditionally grow a range of crops such as rice in paddy fields and other field crops such as maize, millet, ginger and pulses in uplands as rain-fed upland or *chena* cultivation (Slash-burn or shifting cultivation). However, after banning *chena* cultivation and growing cardamom within the Knuckles forest, after its declaration as a conserved area, the villagers chose to cultivate pepper, ginger and vegetables as cash crops. Like many other villages in the Knuckles area, fishtail palm grows well and provides multiple benefits to the community.

Lakegala Rock as seen from the Meemure village

Due to the remoteness and lack of good access roads, this sleepy village remained isolated for a long time and was visited only by the hardiest of travellers and adventurers. This situation changed when the village was selected as a film location for a famous Sri Lankan children's film called Sooriya Arana, which became a box office hit. Almost overnight, Meemure became a well-known and preferred destination for both local and foreign tourists. Gradually, tourism became the main livelihood option for the villagers who provide various services to tourists. At present, annually, an average of 12,500 tourists visit Meemure. This number rises dramatically during the peak tourist season.

It is only natural to expect that unregulated tourism is bound to have a negative impact on the traditional way of life of the residents and affect the environment as well. In the past, engaging in unsafe water sports caused the death of several individuals. As is often the case with most popular tourist destinations, discarding non-biodegradable products such as plastic and glass containers, bottles and polythene sheets in water bodies and the surrounding areas became a significant issue. Shards of glass from broken bottles were a considerable problem at popular bathing sites as they caused serious injuries to residents as well tourists.

Risky water sports at the Thali Kata

Carelessly disposed waste was not only an eyesore but was becoming a serious pollutant. The behaviour of some visitors left much to be desired. Thus, the main income source, tourism, was gradually becoming a source of irritation to residents who realized that the tranquillity which prevailed over the years was being lost with time. Soon, it became apparent to the villagers that the cultural heritage and the quality of the environment were going to suffer irreparably unless they acted fast to regulate the situation.

On the other hand, facilities such as accommodation for tourists and the availability of items of food desired by them were not adequate. The villagers had no idea about how to manage the tourism industry. They lacked the required knowledge, training and resources to satisfy the needs of the tourist, especially on how to cater to the needs of large groups or families who visit the area. Thus, tourism had to focus on offering quality service to customers while preserving the traditional values of the people and improving the quality of the environment.

For tourism to be successful and sustainable, the Meemure village would have to have a long-term vision and plan to develop tourism as a viable and profitable industry. It was this challenging task that Ms. Gunawathi Hewagallage, Head of Community Resource Protection Centre (CRPC), took into her hands. She set out to determine how best to regulate the tourist inflow and provide visitors with adequate facilities and information. The CRPC had to identify the potential of the village's agricultural, natural and human resources and determine how they could be developed to improve people's livelihood. Thus, a CBO named Meemure Traditional Heritage Guardian's Society (MTHGS) was born, with 115 families collaborating to develop tourism while safeguarding the people's cultural heritage.

Project Objectives and Key Activities

The project's overall objective was to minimize the damage caused to the biological and cultural environments due to unregulated ecotourism and transform tourism at Meemure into a viable, sustainable and profitable enterprise.

The project emphasized the improvement of the productivity of the agro-ecological systems and ensure their sustainability. The project targeted to conserve the biodiversity of the area surrounding the village and improve the soil productivity in about 100 ha of farmland. Over the years, both environments had seen haphazard changes that affected the very industry, which was the most important source of income to the villagers.

Awareness-raising sessions were needed to win over reluctant participants to make them contribute to project activities. Collaboration and active support of government organizations were identified as a prerequisite to launching the project. Successful briefing sessions made it possible to obtain the full cooperation of officers of several government departments, including the Divisional Secretariat of Ududumbara, Department of Forest Conservation, Police Department, Ministry of Environment and Central Province Tourism Department. Animation training programmes were conducted for beneficiaries to obtain their full support and commitment. After this challenging but essential groundwork, the project successfully carried out all identified project activities.

Although there were nature trails, guides capable of delivering the kind of service expected by tourists were lacking. Accordingly, two training programmes were conducted to address this skills gap for five persons who currently serve as trackers.

Two training programmes were conducted for selected persons who would offer their services as lifeguards. Upon completing the training, they were awarded

certificates, an identity card, license and uniforms. The lifeguard team comprises 18 members who are on duty at unsafe natural pools in the village frequented by tourists. Several two-day environment camps were conducted for 35 youth on organic farming and current environmental issues affecting the village. A sense of pride was instilled in them by discussing the ecological value of the village.

Essential training to save lives

A theoretical and practical training programme was conducted on Ecological Farming for 115 farmers. Special emphasis was placed on the negative impact of agrochemicals on the environment and humans.

Beneficiaries receiving hands-on training in ecological farming

To promote the productivity of agriculture in the village, seeds of a range of vegetable and grain crops were distributed among the farmers. High quality seeds and planting material were given to beneficiaries to expand the range of crops cultivated and enable farmers to produce seeds for future needs. About 1000 fruit plants belonging to 10 species were also disseminated among the 100 families.

A two-day field visit was conducted for ten farmers at the Makandura Government Farm, a beekeeping farm and selected home gardens in Pannala and selected agricultural lands in Kalpitiya. These visits were designed to expose farmers to new ways of growing crops using organic farming concepts.

Four training programmes were conducted for 45 farmers on pepper cultivation, the main cash crop grown in the home garden. The programme covered all aspects of soil conservation, crop management and processing of agricultural products. Soil conservation measures were carried out in an area of about 100 hectares of home gardens. Training on how to maximize profit from fishtail palm was provided to 15 persons.

A Tourist Service Centre was established to provide quality service to visitors. The centre has a ticket counter, toilets, resting facilities, a counter for making hotel or homestay reservations and an information centre. The visitors can get comprehensive information on all aspects related to nature trails, available water sports, lifeguards, tour guides, etc.

The Tourist Information and Service Centre: multiple services under one roof

The occasion of President Gotabaya Rajapaksa ceremonially opening the Tourist Information and Service and Centre

The Tourist Service Centre also has a display area exhibiting traditional farming tools and household utensils used by the villagers in the past. This centre was officially opened by His Excellency, Gotabaya Rajapaksa, the President of Sri Lanka. A reed and cane handicraft sales outlet was also established near the Tourist Centre. This facility has become popular among tourists as people can purchase souvenirs reminding them of their favourite tourist destination. The direct beneficiaries are the village women who manufacture and sell a range of items, thereby earning an additional income.

The Meemure village has popular tourist attractions such as the Thali Kata natural pond, an ancient *mee (Madhuca logifolia)* tree and village centre, Lakegala viewpoint, Bo Maluwa, etc. It is well known that successful eco-tourism destinations require camping sites and well-organized homestays. The project officers inspected over 41 such establishments and identified areas requiring further improvement to meet the quality standards of the tourism industry. A two-day awareness workshop for 41 persons was organized to improve the maintenance and management of homestays and campsites.

A 2-day training programme was organized for 25 persons on making food products from traditional yam varieties (edible roots and tuber varieties commonly known as yams), jak and immature jak fruits.

Environmental Impact

The project focused on minimizing pollution, land degradation and negative impacts on the biodiversity of Meemure and the surrounding area while developing tourism as an important source of income to the community. The Tourist Information and Service Centre operates a system to collect and manage waste. Awareness creation on best practices for the use of chemical fertilizers and pesticides was targeted at changing the farmers' attitudes. The visitors were advised on best behaviours for enjoying a wonderful and safe ecotourism experience.

Soil conservation measures established in an area of about 42 hectares of home gardens will continue to reduce soil erosion in the long term as farmers have been made aware of the need to maintain earth bunds and other structures from time to time. Reduced usage of pesticides and adoption of organic farming practices will directly impact the water quality and soil productivity and health.

Socio-Economic Impact

The following highlights indicate the socio-economic impact of the project:

- After the commencement of the project, during a three-year period, the lives of 40 people who were engaged in water sports were saved by trained lifeguards.
- The successful manufacture and sale of a range of food and handicraft products have made it possible for village women to be gainfully employed

- The productivity of pepper cultivation has improved significantly and promises to improve the livelihood of farmers. Now, farmers can market their pepper to visitors for a much better price than what traders offer in the open market (Rs. 1200 per kg of pepper).
- Both lifeguards and tour guides earn Rs. 1,500.00 (USD 8) per group of visitors. The annual income of these trained professionals has risen to around Rs. 132,000 (USD 913). Tourist Information and Service Centre also has benefitted from the services provided by the lifeguards and tour guides by obtaining a fee of Rs. 100 for each group of tourists.

Youth Engagement and Participation

Both young women and men are enthusiastic participants in undertaking eco-tourism related activities, serving as lifeguards and tour guides. Some have developed leadership and organizing skills required for gainful employment. Their training has instilled a sense of pride in what they do, which indicates that conservation of the environment in Meemure is in competent hands.

Gender Equality and Women Empowerment

Both men and women receive equal benefits from the project. Women have been involved in the Tourist Information and Service Centre maintenance, home gardening, handicraft manufacturing, jaggery production and traditional food preparation. They are also responsible for the upkeep of the camping site and homestay maintenance and housekeeping tasks. It is noteworthy that about 75% of the contribution to the CBO is received from women. The leader of the CBO, being a woman, has set an example as a role model worthy of emulation by others.

Sustainability

The CBO is a registered organization that will continue to operate successfully, strengthened by the support network of government and non-governmental organizations involved with project activities from the inception of the project. With rising popularity as a suitable tourist destination, income generation would be assured in the long term. Capacity development of youth would ensure that customer satisfaction would continue to be excellent once the Covid-19 pandemic releases its grip on the country.

The CBO earns revenue from multiple sources such as the manufacture of handicraft items, food preparation and sale and offering various services to tourists. The failure in one area is not likely to affect the overall financial situation of the CBO, ensuring its stability. Transparency in maintaining accounts, clear

communication among organization members, formalized procedures and inspirational leadership would ensure the long-term sustainability of project initiatives.

Lessons learned

Dealing with issues that are likely to cause concern among community members should be identified and addressed at the outset. Clear communication, formalization of procedures, empowerment of organization members and providing short-term gains to the beneficiaries have to be emphasized during all stages of project implementation.

Like in any new project, the CBO had its teething problems. Encouraging villagers to contribute to the project was an uphill task. People who are already engaged in tourism-related activities thought that the project would negatively affect their trade. Farmers did not feel motivated about committing themselves to tourism development as they were busy with their day-to-day activities in their homesteads or rice fields.

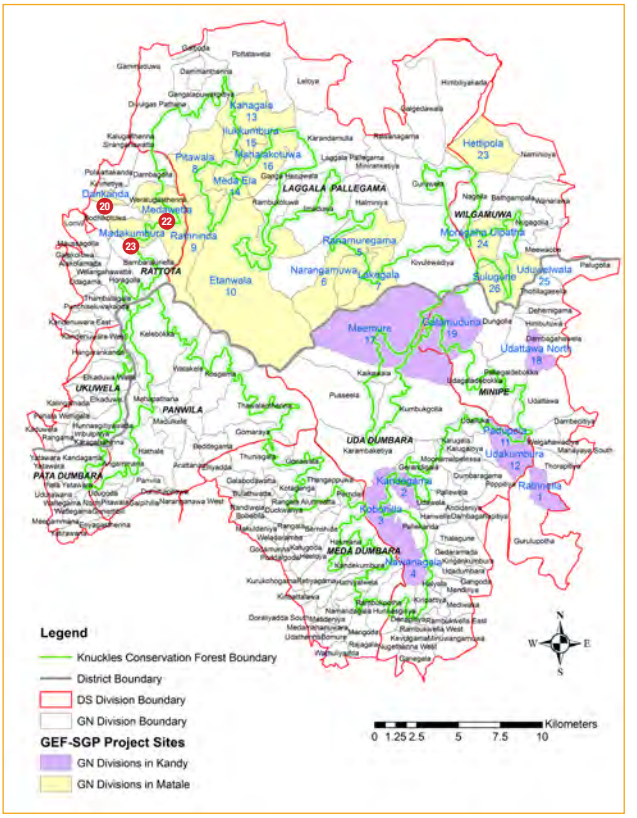
Partners

The main partners and their contributions are given below:

- The Central Province Tourism Department, University of Peradeniya and the Dumbara Mithuro environmental organization: Provided training facilities on eco-tourism development activities
- Sri Lanka Life Saving association: Conducted a training programme for the lifeguards
- The Department of Export Agriculture: Provided training on pepper cultivation
- The Department of Forest Conservation: Helped to sort out some important land issues
- The Divisional Secretariat and Pradeshiya Sabha: Continually supported the project in carrying out project activities
- Sri Lanka Police, Ududumbara: Helped to monitor the water sport activities and ensure the safety of the tourists
- The Ecological Farming Training Centre in Pannala: Provided training on ecological farming
- The Agro Technology Park, Gannoruwa: Supported plant distribution and tree planting

- The Kandy District Office of the Land Use Policy Planning Department: Facilitated the mapping of the project area
- Sri Lanka Telecom/ Mobitel: Provided communications equipment needed by the Tourist Service Centre.
- The Bank of Ceylon: Set up an ATM at the Tourist Information and Service Centre
- The Community Education Centre, an NGO: Provided leadership training

Improving the Lifestyle and Economy of Marginalized Estate Workers of Midland Estate in Rattota



Project No:	SRL/SGP/OP6/STAR/LD/2019/27
Grantee Organization:	Grama Abiwurdhi Foundation for Environmental Conservation (GAFEC)
Location:	Dankanda, Madakumbura & Medawatta GN Divisions, Rattota DS Division, Kandy District
SGP Contribution:	$30,000.00
Cash Co-Financing:	
In-Kind Co-Financing:	US$ 22,500.00
Project Duration:	25 months
Focal Area	Land Degradation

Background

Midland Estate is a tea plantation belonging to Sri Lanka State Plantation Corporation (SLSPC) in the Rattota Divisional Secretariat division. It is located on the way to Riverston between the 21st and 25th km posts on the Matale-Riverston-Illukkumbura-Laggala road. Due to the area's high scenic beauty, many local and foreign tourists visit the Riverston area. According to records maintained by the ticket counter, the total number of tourists visited was 71,535 in 2018. The total population of the estate worker community was 2162 individuals in 2019. Of this, 1364 were females.

The estate workers have been allocated blocks of land of 7 perches each to put up a house. The workers' primary source of income is the daily wages/ monthly salaries they earn by working in the tea plantation. The amount earned is quite insufficient to cater to their day-to-day needs. As a result, some workers have started to migrate to nearby towns to work in shops, construction sites, and do various odd jobs. Meanwhile, some villagers receive an additional income by providing various services to tourists who visit the area.

Camping site near Kataranthenna Lake

Among the main attractions of the area are two small lakes named the Kataranthenna and Dankanda lakes. In the past, these lakes were used to generate electricity to power the tea factory. In the recent past, the lakes became highly silted due to heavy soil erosion taking place in tea lands located above the lakes. Further, about 50% of the total area of the plantation is not cultivated on account of poor soil fertility. These lands too have contributed the siltation of the lakes.

After 2001, about 1000 hectares of the land area above the 3500 ft contour were declared as the Knuckles Conservation Forest by the Forest Department (FD). It prevented the people from harvesting cardamom or other products found in the area, resulting in a severe drop in the villagers' income.

A project, launched by the Grama Abhiwurdhi Foundation for Environmental Conservation (GAFEC) led by Mr. Gamini Jayathissa, sought to provide solutions to the most critical problems encountered by the residents of Midland Estate. In 2019, the GAFEC formed a CBO with a membership of 50 persons to promote ecotourism and green adventure as sustainable income-generating opportunities while addressing the core issues of land degradation and poor productivity of tea lands.

Project Objectives and Key Activities

The project's main objective was to ensure the restoration of the ecosystem in the area around Dankanda and Katarantenna lakes in Midland Estate, reduce soil erosion and restore some abandoned tea lands to increase the income levels and to improve livelihood options available to the plantation workers.

Soil conserved before replanting tea above the Kataranthenna lake

One of the more significant activities undertaken to improve the productivity of the plantation was to replant the abandoned lands and fill in vacancies where it was needed in and around the catchment of the two lakes. As an analog forest, 4000 seedlings and 10,000 plants were planted in 2 hectares of abandoned land.

Special attention was focused on making the entire location sufficiently attractive to develop a thriving tourist industry. Numerous native trees, including fruit trees, were planted in 40 hectares. With time, these trees planted in the buffer zone are expected to provide tangible benefits to the residents in improving their nutritional status and enable them to earn an additional income.

Soil conservation was achieved by establishing stone bunds, check dams, leader drains, live barriers of vetiver (*Vetiveria zizanioides*) and lock and spill drains in an area of 4 hectares near the Kataranthenna lake. Both Kataranehenna and Dankanda lakes were de-silted with community participation.

A well-organized park named Riverston Midlands Eco-Tourism and Eco Adventure Park offering various kinds of entertainment to tourists such as kayaking, hiking, target practicing, archery and camping was established. In addition, a rock-climbing site for those who seek adventure was set up near the 21st km post.

Archery for those who love the sport

Kayaking for lovers of water sports

In the past, the access road to the Dankanda lake area was hardly motorable. It could be used only by 4-wheel drive vehicles. The damaged part of this road was fully repaired. Now, all kinds of vehicles can reach the tea estate with ease. At the tea factory itself, visitors can observe all stages of the tea manufacturing process, and get an in-depth understanding of how different kinds of tea are manufactured for sale in different markets.

Further, the project set up a nature trail (Tea Kele Peth Maga) starting at the 25th km post and leading to a lake in Batadandukanda through the tea plantation. Other tourist attractions, including a 14 km long cycling track, a walking path around the camping site and a garden area in the vicinity of the camping site were also developed. The camping sites provide all amenities needed by tourists, including sanitary facilities. A website (www.gafecsrilanka.org) and social media are actively used to attract local and foreign tourists to Midland Estate.

The marginalized estate worker communities have been educated about sustainable environmental conservation to improve their livelihood options. The project also emphasized tapping of fishtail palms as a means of income generation, and 70 individuals were trained.

Environmental Impact

The project has significantly changed how the estate workers treat their environment, as most activities were carried out with their participation. Filling in vacancies in the existing tea plantations and establishing new plantations on abandoned land were carried out to reduce the threat of splash erosion. The analog forest also would, with time, further reduce soil erosion and enhance the beauty of the location.

De-silting of the two lakes has expanded the water storage capacity and helped raise the groundwater table allowing many water-loving plants to thrive at the fringes. Further, excessive run-off was prevented, reducing the loss of soil particles down the slope. Erosion prevention measures have proved to be highly successful in reducing soil erosion, and it is hoped that earth bunds and live barriers of vetiver would further help improve soil productivity. The barren land that was reforested with native species and a range of diverse fruit trees, once fully grown, would entice birds and mammals to the area. De-siltation of the tank has increased the biodiversity within the tank and surroundings, as can be seen by the presence of various birds, insects and fish species.

Socio-Economic Impact

Productivity of the tea estate is expected to improve due to the tea replantation and in turn that would improve the livelihoods of the estate workers. The average annual harvest from the replanted tea was 600 kg from 4 hectares. The added income amounted to Rs. 48,000 per month (USD 240). From eco-tourism, the CBO received an average monthly income of Rs. 20,000 (USD 100). This amount may seem insignificant, but one must consider the negative impact of the current crisis precipitated by the pandemic that has drastically reduced tourists' visits to the area. The CBO's main revenue came from the restaurant, sales centre, sale of entrance tickets and vouchers to promote organization-sponsored eco-friendly games. The new eco-trail and the camping site established by the project promise to be a good source of income for the nearby villagers. Once the travel restrictions are lifted, the project expects to improve the socio-economic conditions of over 100 tea plantation worker families by 25% through various project interventions.

Youth Engagement and Participation

A youth population of about 540 persons worked closely with the project staff. About 64% were educated up to GCE (O/L), and would be quite capable of offering a valuable service to promote adventure tourism. Without their active participation, the reforestation programme would have experienced severe difficulties. Establishing and maintaining soil conservation structures were carried out with their participation. Trained youth showed much promise as being the most important contributors to promoting ecotourism and related activities.

World Mountain Day Celebration

Gender Equality and Women Empowerment

Both men and women receive benefits from the project equally. It is well known that most of the tea pluckers are women. Therefore, the contribution of women to the financial status of households is overwhelmingly high. Further, soil conservation-related activities were also conducted with the participation of women.

Sustainability

The CBO has the overall responsibility for regularizing all activities related to income generation and enhancing the financial strength of the organization. Added income from newly planted tea promises to increase as the bushes grow bigger and become more productive with time. According to the Business and Sustainability plan compiled by Industrial Solutions (Pvt) Ltd, the projected income of the cooperative society is expected to be Rs. 3,990,950 (USD 20,640) in 2021, Rs. 4,844,158 (USD 25053) in 2022 and Rs. 5,811,015 (USD 30054) in 2023.

Then, the CBO expects to provide more employment opportunities to villagers and train them to handle diverse tasks related to continuing project interventions. Once the country reopens, the eco-tourism-related activities could be further improved to ensure the long term sustainability of ongoing programmes.

Lessons learned

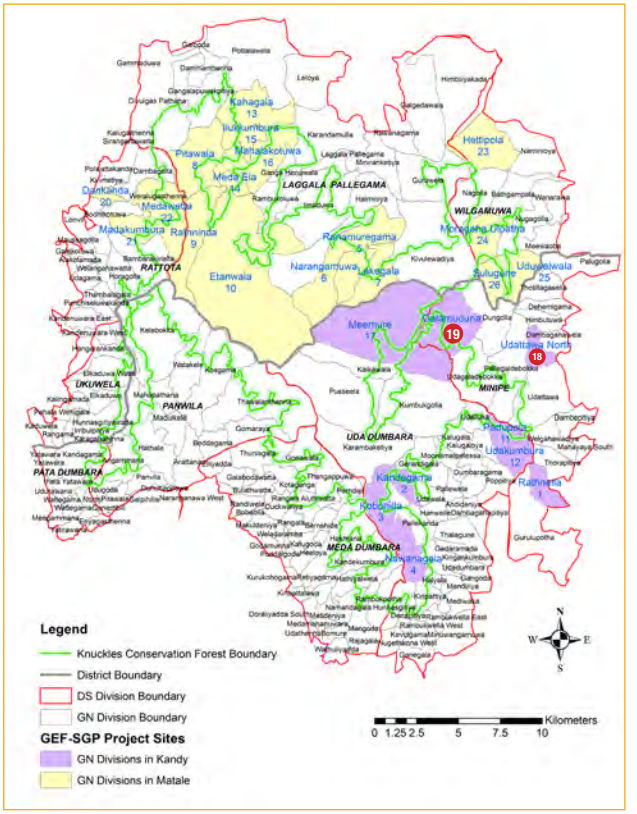
Maintaining good relations and cooperating with the relevant government organizations during all stages of project implementation are vital to reap the maximum benefit from the project. Right from the beginning of a project, it is desirable to have an agreement between the project and the relevant government authorities. Further, the flexibility of the project officials when conducting project activities will help to coordinate and implement project activities more successfully.

Partners

The Divisional Secretariat, Laggala: Advised to implement project activities

- The State Plantation Corporation & Midlands Estate: Facilitated the implementation of activities at the site.
- The Forest Department and the Moragahakanda Development Project of Mahaweli Authority: Provided plants required for the analog forest.
- The Vidatha Centre and the Ministry of Lands and Land Development: Provided support to educate state workers on fishtail palm tapping and environmental conservation.
- Academy of Adventure: Collaborated to establish the Riverston Midlands Eco-Tourism and Eco Adventure Park
- The Ministry of Plantation: Supported renovating of the access road to the two lakes.
- The Central Province Tourist Board: Provided funding to set up the walking track

Stimulating the Household Economy of Four Villages in the Minipe Divisional Secretariat Division in the Kandy District



Project No:	SRL/SGP/OP6/STAR/LD/2018/25
Grantee Organization:	People's Livelihood Development Foundation (PLDF)
Location:	Udaththawa, Galamuduna GN Divisions, Minipe DS Division, Kandy District
SGP Contribution:	US$ 30,000.00
Cash Co-Financing:	US$ 48,900.00
In-Kind Co-Financing:	US$ 57,900.00
Project Duration:	18 months
Focal Area	Land Degradation

Farmlands on the summit

Background

Udaththawa and Galamuduna are two Grama Niladhari Divisions (GNDs) situated in the vicinity of the Knuckles Conservation Forest in the Minipe Divisional Secretariat Division in the Kandy district. The number of families of these GNDs is 150 constituting 480 members. They eke out a meagre existence from rice cultivation, practising slash-burn agriculture and harvesting forest products. Their primary income source is making treacle and jaggery, which are highly marketable natural sweeteners made from the sap obtained by tapping the inflorescence of the fishtail palm (*Caryota urens*). An extra income is also received from cultivating spice crops such as pepper, turmeric and ginger.

The remoteness of the villages and the lack of proper access roads connecting them with the closest towns have posed severe problems to villagers who have to walk long distances to reach the nearest markets. Conversely, traders from the town rarely visited the villages to purchase farmers' produce. In addition, the residents experienced a lack of adequate health facilities and knowledge of alternative

income generating opportunities. More importantly, the villagers suffered from backward attitudes which prevented them from improving their livelihood. Soil erosion was rampant, and man-made forest fires frequently destroyed the vegetation and caused land degradation. The ever-increasing human-elephant conflict further exacerbated the situation. The meagre crop yields were hardly adequate to satisfy the farmers' day-to-day needs. It seemed like the residents had accepted their fate and resigned to the idea that nothing much could be done to improve their lives or improve their environment.

Field visits with consultants to the tallest project site in Knuckles landscape

Soon it became evident that something had to be done to address these issues. Mr. Priyantha Kumara, the Chairman of People's Livelihood Development Foundation (PLDF), took the initiative to implement a project to encourage the poverty-stricken village community to form a community-based organization called Pubudu Welfare Society, consisting of 100 members. It was started with the

dual objectives of ensuring the livelihood development of residents and reducing soil erosion and conserving the biodiversity of the area covered by Meda Kale, Aswedduma, and Lihiniketiya villages of the Udaththawa and Galamuduna GNDs.

Project Objectives and Key Activities

The main project objectives were to;

- Enhance the livelihood options available to villagers
- Improve the productivity of agricultural pursuits by reducing soil erosion, use of eco-friendly farming practices and expanding the range of crops cultivated by farmers
- Promote a change in the attitudes of farmers to make them adopt new technology for adding value to products and help develop agribusiness ventures by improving access to outside markets

Initially, activities were centred around identifying key issues affecting the villagers. This was accomplished by conducting discussions with local authorities such as the Development Officers of Minipe Divisional Secretariat and the Grama Niladari officers. The next step was to identify community leaders and the CBOs who could actively contribute to the project. The last item in the preparatory stage was to survey sources of income and livelihood options available to the villagers. The main constraints identified in the study are listed below:

- Lack of hygiene in the manufacture, packaging and handling of fishtail palm products
- Lack of training related to extracting the sap of the fishtail palm and the inability to manufacture quality products that would fetch a high price in the market
- Lack of suitable technical know-how on how to control a pest (Red Weevil) infesting fishtail palms
- Dependence only on naturally-growing fishtail palms rather than establish new seedlings to promote the long term sustainability of the industry
- Low productivity of home gardens and rice cultivation
- Soil erosion in home gardens and chena (rain-fed uplands)

Climbing fishtail palm trees entails a high degree of risk to the tapper. The villagers usually do not wear safety harnesses while carrying various items such as very sharp knives, containers for collection of sap and items needed to treat the cut surface of the inflorescence, up and down the trees. The project provided safety training and issued safety harnesses and other essential equipment to 40 fishtail palm tappers to prevent potential accidents. An insurance scheme was also introduced to provide relief to persons who may suffer an injury while tapping the palms.

Three training workshops were conducted for 66 villagers on the manufacture of fishtail palm-based products using new technology, treating fishtail palm inflorescences properly to increase sap collection, preparation of quality products, use of appropriate marketing strategies and packaging. Solutions were also given to control Red Weevil infestation decimating fishtail palms. The community planted 3200 fishtail palm seedlings in the field.

Two training workshops on improving the productivity of home gardens, which mainly consist of export agriculture crops such as pepper, turmeric, and ginger, were conducted. Seedlings of a range of fruit crops, vegetable crops, aloe vera, ginger, turmeric and a range of traditionally grown yams and tubers were distributed among 100 farmers cultivating home gardens. The beneficiaries were 85 families from Udaththawa and 15 from Galamuduna GNDs. Traditional rice varieties were introduced to 18 families of the Galamuduna GND. These traditional varieties, enjoying high market demand, were planted in an area of about 17 ha.

Stone and soil bunds were put up in the home gardens and check dams were established in the main waterways to prevent soil erosion.

The project prioritized tree planting to improve the biodiversity in denuded or barren lands along both roadsides leading to Galamuduna and Meda Kele villages. Altogether, about 4000 native trees were planted with community participation. Some of the species were edible fruit trees and trees used in indigenous medicine. Soil degradation prevention activities were carried out on the roadside.

The project introduced poultry farming to improve the livelihoods of 20 families. Each family was given 15 egg-laying hens and six roofing sheets to build chicken coops. Roofing sheets were also given to two families to construct two goat sheds. Two practical training workshops on bee-keeping were conducted for 30 beneficiaries. The farmers were given 130 bee boxes along with 15 colonies of bees.

At the outset, the project had identified the lack of drinking water in the Lihiniketiya village as a serious issue. Therefore, two 1000 litre tanks were set up near a natural spring, and pipes were laid to supply water to 12 households.

The project constructed two bridges and paved with concrete 60 m of a stretch of badly eroded road leading to the Galamuduna village.

Making repairs to a badly eroded road

Environmental Impact

Reforestation of barren land, consolidation of the banks of streams and waterways by establishing indigenous trees, and construction of earth bunds and drains in the home garden allotments have significantly lessened the severity of soil erosion. The villagers have acquired the requisite skills for maintaining these soil conservation measures in the future as well. The reforestation target set by the project of 100 ha was successfully achieved with community participation. As a result, flora and fauna in Udaththawa and Galamuduna GNDs and adjacent areas belonging to the Knuckles range were provided a better environment. Training given to the farmers on eco-friendly farming has enabled the project to convince farmers about the need to reduce the pollution of waterways and groundwater, on which the people depend to obtain water for their day-to-day needs.

Socio-Economic Impact

The project initiatives have managed to uplift the economy of the villagers by using a variety of strategies. These include activities focused on improving the productivity of agricultural lands and introducing new technologies and training for developing cottage industries, such as the production of foodstuffs obtained from the fishtail palm. Improving access to outside markets, value addition to products, and improving the quality of products have significantly changed the lives of the villagers. The PLDF purchases many items produced in the project villages to support the farmers' ability to obtain a good price. The estimated annual income received by the 37 fishtail palm tappers in the village was Rs. 1,890,000 (USD 9546) from the sale of jaggery and Rs. 2,835,000 (USD 14,318) from treacle. The PLDF also purchases pepper and turmeric grown in the project area.

The wide range of crops presently grown in the villages has improved the villagers' nutrition and health, and the improved access to external markets has helped the farmers earn an additional income from the sale of surplus produce.

Animal husbandry, including poultry farming and goat rearing, contributes to the household economy. The manure is used to improve soil productivity in the home gardens. The introduction of bee-keeping promises to be a highly profitable exercise as pure bee honey and wax are highly marketable.

Youth Engagement and Participation

Changing of attitudes is best achieved with young people. So, the project focused on getting the youth to collaborate in all activities carried out in the two GNDs. The youth from the Meda Kale village contributed significantly to the tree planting campaign and actively supported the establishing of soil conservation bunds. As the profitability of fishtail palm tapping is felt, it is expected that more and more youth will choose this as a livelihood option. Promoting fishtail palm farming as a well-planned and organized industry can also help prevent youth migration from the village to cities.

Gender Equality and Women Empowerment

The project activities were focused on both males and females. While men were engaged in fishtail palm tapping, the women were the mainstay in managing the household economy. They were vested with the task of transforming the raw fishtail palm sap into jaggery and treacle. The ideas expressed by women were significant for charting the way ahead in implementing project activities. Women leaders were particularly helpful in offering valuable advice and suggestions to the project implementers in relation to activities conducted in the home gardens.

Sustainability

The project has done much to ensure the long term sustainability of the fishtail palm industry. The palm needs about 8-15 years to reach maturity and produce inflorescences that can be tapped over the next 4-5 years. Hence, depending only on naturally growing trees would not be an option for steady income generation in the long term. The older plants would have to be cut down and used to make starch, a product used for making desserts and medicinal preparations.

The project has provided seed money of Rs. 25,000 (USD 130) to each village to create a revolving fund to support the CBO. According to the Business and Sustainability Plan compiled by the Institute of Industrial Techno Management (Pvt) Ltd. for the Pubudu Welfare Society, a total income of Rs. 1,054,500 (USD 5454, March 2021) and Rs. 1,406,000 (USD 7272) are expected in 2021 and 2022, respectively, from the sale of spices, fishtail palm products and membership fees. The engagement of youth and strong leadership shown by village leaders in implementing project activities have made it possible to ensure their support in the future. It is envisaged that there is a possibility of creating more employment opportunities for young entrepreneurs within the next three year period as the capacity and the financial strength of the CBO increase with time.

Lessons learned

Damage caused by wild boar and porcupine to newly established tender fishtail palms was heavy. It has been realized that fishtail palm plants need to be more mature and hardened to withstand adverse weather conditions and resist damage by wild animals. Some research would be required to determine the ideal plant height suitable for establishment in the field.

Bee-keeping is yet to show a significant contribution to the household economy. Managing the hives and prevention of diseases and solving some other technical difficulties would have to be undertaken before farmers would be enthusiastic about adopting apiculture as a viable income generating opportunity.

The main challenges faced when conducting project activities were difficulty in travelling due to badly eroded roads, shortage of planting materials for the project activities and the ever-present human-elephant conflict. The planting material had to be obtained from outside sources, and the community was organized to minimize human-elephant conflicts.

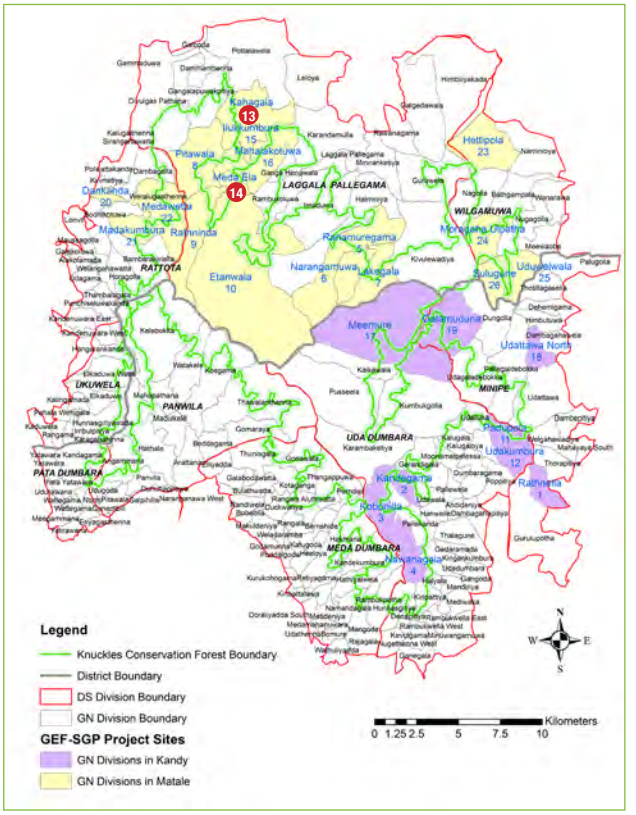
Partners

- The Forest Department: Provided the necessary support for tree planting activities.
- The Industrial Technology Institute (ITI) and Ratnapura regional office of the Ministry of Industrial Development: Assisted with offering training programmes on fishtail palm industry.
- The Sri Lanka Standards Institute: Developed a standard for fishtail palm products and helped to develop packaging strategies for fishtail palm products.
- The Grama Niladari Officer and Development Officers: Helped initiate project activities.
- The Department of Export Agriculture, the Department of Agrarian Development, and NGOs, namely GAFEC, CDC, and Weligepola Ekabadda Prajasanwardhana Kantha Maha Sangamaya: Provided the resource persons to conduct home gardening and forest conservation training.
- The Central Bank of Sri Lanka: Provided loan facilities of Rs. 125,000 each for 37 families.
- The Smallholder Agribusiness Partnerships Programme (SAPP): Provided fishtail palm tapping tools to 37 beneficiaries.
- The Department of Primary Industries of the Ministry of Industry and Commerce: Provided 130 bee-keeping boxes.

- The Divisional Secretariat, Minipe and the Samurdhi Development Department, SAPP and Temple of Tooth Relic, Kandy: Provided financial support in road and bridge construction.
- Dr. R.W.K. Punchihewa, a bee-keeping expert: Served as the resource person for bee-keeping training.

Land Degradation

An Integrated Approach to Conserving Biodiversity and Improving Farmers' Livelihoods



Project No:	SRL/SGP/OP6/STAR/BD/2018/20
Grantee Organization:	Anurudha Arana Trust (AAT)
Location:	Kahagala & Meda Ela GN Divisions, Laggala DS Division, Matale District
SGP Contribution:	US$ 30,000.00
Cash Co-Financing:	US$ 5,900.00
In-Kind Co-Financing:	US$ 52,900.00
Project Duration:	20 months
Focal Area	Bio Diversity/Land Degradation

Background

Kahagala and Meda Ela Grama Niladari Divisions (GNDs) are in the Laggala Divisional Secretariat Division of Matale District and these two villages are located within the scenic Knuckles Mountain range. Meda Ela area is a part of the Theligamu Oya watershed which nourishes the recently built Kalu Ganga reservoir, while the Kahagala area belongs to the watershed of Kahagala Oya, which feeds the Moragahakanda reservoir. These two GNDs have a total population of 333 persons belonging to 112 families. The total land area is 340 ha, while the arable area is 63 hectares. Farmers own 50 hectares of rice fields which they cultivate during the major rainy season which is from January to April.

Their usual practice is to grow perennial crops, vegetable and spice crops and medicinal herbs in the home garden and rice during the late maha season (January to April). Traditionally, agriculture and extraction of non-timber forest products from the conservation forest are the main livelihoods of the villagers. In 2010, farmers' economy was severely hit due to the suspension of all human activities in the Knuckles Forest area after its proclamation as a protected area.

Rain-fed agriculture allowed the cultivation of only a single crop in the uplands and rice in paddy lands in the maha season. The land productivity of uplands is low due to degradation caused by soil erosion. In these lands, farmers cultivate vegetables. Chilli and beans are grown as cash crops during the minor rainy season (*yala*) in paddy lands using supplementary irrigation from streams. The farmers use an excessive amount of chemical fertilizer and pesticides on these cash crops causing severe environmental pollution.

Practical demonstration of using the " A-frame " in soil conservation

In 2019, the severity of problems faced by the villagers prompted the Anurudha Arana Trust (AAT) led by the Buddhist Monk Venerable Mugunuwela Anurudhdha Thero to launch a project with a CBO named Kahagala - Meda Ela Ekabadda Krushi Nishpadakayange Samithiya (Kahagala-Meda Ela United Agricultural Producers' Association). At present, the total membership amounts to 45 individuals.

Project Objectives and Key Activities

Main objectives of the project were to conserve biodiversity and reduce soil erosion in the area while improving the livelihoods using an integrated environment conservation approach. The main interventions focused on reducing the devastating effects of soil erosion and the consequent siltation of the Moragahakanda/ Kaluganga reservoirs, conserving the Theligamu Oya and the vicinity, and improving the agricultural productivity of the villages.

The AAT understood that awareness creation on important environmental conservation issues had to be accorded top priority. There was a critical need to convince the farmers to take immediate action to safeguard the environment. Two practical training programmes were conducted to educate community members numbering 150 persons on technical aspects related to establishing soil conservation measures in their home gardens and uplands. The villagers conserved 300 hectares of land by constructing stone bunds with a total length of 5,000m, lock and spill drains and live fences.

Ven. Mugunuwela Anurudhdha Thero, distributing plants among the beneficiaries

Reforestation in Red Bana Village Area

Seeds and planting materials, gardening tools, water tanks and miscellaneous equipment were provided to motivate farmers with 50 home gardens benefitting from this activity. The farmers were trained on Good Agricultural Practices (GAP) to be adopted in intensive crop cultivation and home gardening. More enterprising

farmers were given 20 drip irrigation systems for improved productivity of their home gardens. In addition, 1000 fruit plants were distributed among the project beneficiaries for planting in their homesteads.

A soil bund established in a slopping farm land

Among other approaches used to achieve project objectives were the promotion of beekeeping and the distribution of energy-efficient wood stoves. Reforestation of the catchment area of Thelgamu River and the Redbanagama village area was a major undertaking carried out with community participation where 4000 trees were planted in the latter location.

Three families were supported to develop their business ventures. Two home stays were upgraded in the Redbanagama and Meda Ela villages. The food sales outlet established in Kahagala commenced selling locally-produced foods to tourists who visit Sera Ella. Two training workshops were conducted for selected beneficiaries to set up new businesses and run them profitably.

Environmental Impact

The community established 10,000m of soil bunds, lock and spill drains and live fences in 300 hectares to conserve soil in the uplands and home gardens. These measures will not only conserve the soil in farmlands, but also prevent the siltation of water bodies downstream. The energy-efficient wood stoves will reduce the demand for firewood and improve the air quality in the kitchen. It will

benefit the women's health condition due to reduced smoke inhalation. Planting trees in the home garden and denuded patches in the forest will increase CO_2 sequestration and biodiversity.

Ecologically-sound farming practices and GAP have improved the agricultural productivity, and made the villagers less dependent on pesticides and chemical fertilizers. Cultivating home garden crops under drip irrigation has enabled increased water use efficiency in the relatively drier parts of the area.

Socio-Economic Impact

Distribution of bee boxes

Awareness creation on project outcomes to a group of beneficiaries

Several income generating activities such as beekeeping, upgraded homestays for tourists and eco-friendly home gardening were promoted. Facilitating the development of small businesses and distributing essential farming equipment has reduced the burden of hard work.

The average monthly income of the beneficiaries in 2019 and 2020 was Rs. 6000 (USD 31, March 2021) and Rs. 11,000 (USD 57), respectively. Within one year after launching the project, the monthly income increased by Rs. 5000 (USD 26). This amount may seem like a modest improvement in the finances. It is noteworthy that this improvement of the household economy was achieved in the backdrop of a significant improvement in the quality of the environment.

Youth Engagement and Participation

The project gave priority to youth, women and low-income groups to enter into partnerships and take part in decision-making relating to future initiatives designed to benefit the community. Participatory decision-making has empowered the villagers considerably. Youth have proven their ability to become

capable entrepreneurs. The soil conservation and tree planting programmes at the Mahalakotuwa School were carried out with the participation of school children who were highly enthusiastic about taking part in these activities.

Gender Equality and Women Empowerment

Both men and women have benefitted from the project. Females were actively involved in project activities such as home gardening, soil conservation and adding value to products. They also handle planning, implementing and evaluating the progress of activities and focusing on areas that require further improvement. Women have been a tower of strength to those who play leadership roles in the CBO.

Sustainability

Controlling land degradation by establishing soil conservation structures was considered as the most important means of achieving sustainability of agricultural production. Soil conservation in home gardens and selecting suitable crops for growing in the conserved areas have started giving dividends to farmers. These farmers who had initially not paid much attention to home gardening have achieved food security and enhanced incomes during the period of pandemic lockdown. After the project commencement, villagers have started to use sustainable land management practices with a high degree of success.

The project supported two entrepreneurs to establish home stay facilities and another one to set up a local food product sales centre targeting tourists to the Sera Ella waterfall. A detailed plan has been formulated to ensure the sustainability of all project activities. Accordingly, the forest patch in the Redbanagama reserve, where reforestation activities were conducted, will be maintained with the assistance of the Forest Department. Moreover, existing bee honey and Mee oil extraction industries will be expanded by providing marketing and technical training through the established CBO and thereby ensuring the sustainability of the society itself. It is expected to maintain soil conservation practices in home gardens and other degraded areas of the village through direct intervention of the CBO Kahagala- Meda Ela United Agricultural Producers' Association by organizing events and providing training required by the community.

Lessons learned

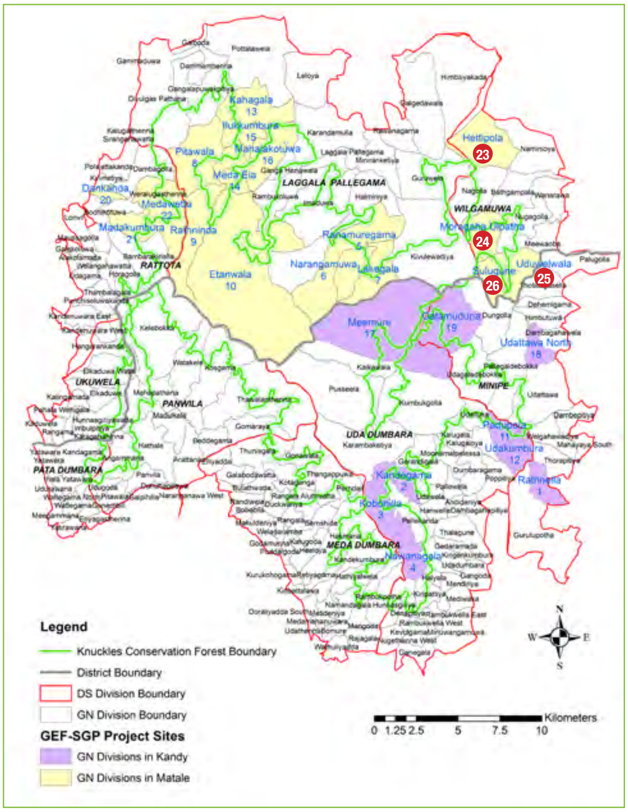
The local government contribution plays a vital role in being able to initiate and successfully conduct project activities. Identification of community leaders capable of mobilizing the community right from the beginning is crucial to the

success of all project activities. Emphasis must be placed on the empowerment of women when formulating project interventions concerning homestead development and value addition to agricultural products.

Partners

- The Laggala Divisional Secretariat and the Forest Department: Supported project activities and participated in the project monitoring meetings.
- The Integrated Development Association (IDEA): Educated the community on the energy-efficient Anagi firewood stoves. IDEA provided 80 stoves to beneficiaries.
- Rangiri Thakshana Piyasa: Helped with the reforestation activities.
- The Office of the Registrar of Pesticides, Peradeniya: Provided training on GAP.
- The Agricultural Instructor of Illukumbura: Conducted training to villagers on home garden improvement methods.
- The Agrarian Service Centre, Galewela: Provided technical support for beekeeping.

Women to the Forefront as Initiators of Change



Project No:	SRL/SGP/OP6/STAR/BD/2019/31
Grantee Organization:	Integrated Community Development Women's Federation (ICDWF),
Location:	Hettipola,Moragaha Ulpatha, Uduwelwala & Sulugune GN Divisions, Wilgamuwa DS Division, Matale District
SGP Contribution:	US$ 90,000.00
Cash Co-Financing:	US$ 53,200.00
In-Kind Co-Financing:	US$ 50,950.00
Project Duration:	18 months

Background

Hettipola, Moragaha Ulpatha, Uduwelwala and Sulugune GN Divisions (GNDs) are located in the buffer zone of the Knuckles Conservation Forest. The population of the above GN divisions is 4000 with 1130 families. Farmers practice slash/burn agriculture in the uplands and rice cultivation under three small village tanks. As no soil conservation practices are used, soil erosion due to uncontrolled run-off has severely depleted the fertility in the uplands while the crop productivity in the rice fields was affected due to water shortage. In addition, storm water from the upper catchment areas cause severe off-farm soil erosion. Soil loss from the catchment areas and resulting siltation have reduced the available water to such an extent that farmers could no longer cultivate the full extent of rice fields as they did in the past. As such, it is hardly surprising that 98% of the villagers had monthly earnings below the poverty line (Rs. 10,000 equivalents to US$ 50). In a pre-project survey, poor nutrition, unhealthy living conditions, low agricultural productivity and widespread chronic and waterborne diseases surfaced as important problems affecting the lives of the residents. The available arable lands were often not cultivated fully.

Ms. Renuka Bhadrakanthi, Executive Directress of Integrated Community Development Women's Federation (ICDWF), carried out this project to change this depressing situation by improving the income from farming, improving villagers' lifestyles, and conserving the environment using a range of strategies suitable to the area.

Project Objectives and Key Activities

The main objectives of the project were to improve agricultural productivity in an extent of 1000 hectares through soil and water conservation, good land management practices and introduction of suitable crop species and thereby ensure the livelihood development of villagers.

At the outset, the implementers conducted a needs assessment. The total number of persons who participated in the field survey was 750. Government officers were also interviewed to obtain their ideas on critical issues affecting the community. Subsequently, an awareness session for beneficiaries was carried out with the support of Agricultural Instructors.

Farmers were made aware of the need to implement scientifically-sound soil conservation strategies in an area of 1000 hectares of farmlands and off-farm sites in Moragaha Ulpatha, Uduwelwala, Sulugune and Hettipola GNDs. This task was accomplished with community participation. Four-hundred-fifty-two home

gardens were stabilized by putting up soil conservation barriers and drains with community participation. The access road to the Goda Ulpatha village was paved with concrete as, in places, it was badly eroded due to uncontrolled run-off.

A happy recipient of plants for home gardening

Agroforestry was identified as an effective means of solving multiple problems plaguing the villagers. The farmers' nutrition needs had to be ensured while promoting productivity from farmlands. Seven-hundred-fifty farmers were trained and advised on practicing agroforestry. They were provided the full amount of seeds and planting materials needed to cover all the abandoned and denuded lands. Over 45,000 fruit plants and cash crops were also distributed among farmers. Further, 20,000 plants were distributed with the co-financing from an organization named One Tree Planted.

Two-hundred-seventy-five farmers were trained on sustainable land management and water conservation. Some villages face severe water scarcity. Therefore, ten agricultural wells and a water tank with a capacity of 25,000 litres were constructed to mitigate crop failure.

PVC pipes were provided to 25 families to facilitate supplementary irrigation to home gardens. Further, 1200 m of an irrigation canal called Sulugune Ela and Gamewela Anicut were renovated to deliver water to rice fields. The ICDWF also looked into improving drinking water quality and provided a water purification tank and constructed a well. This well provides drinking water to 17 families who faced huge difficulties due to water scarcity. Moreover, a water pump and pipes

were provided to a family with a disabled woman. Currently, 54 families receive a continuous supply of drinking water from the water tank for a very affordable charge.

An agro wellunder construction

Renovation of the Sulugune canal

Rubber, which is a new crop to this area, was established in 11 hectares of land with the collaboration of the Rubber Development Department in the Watagala Yaya area GND, providing benefit to 35 farmers. Rubber seedlings were planted only after following good soil conservation practices. In addition, 20,000 miscellaneous trees were planted with financial support from the organization One tree planted. Trees were planted in home gardens of 1224 farmers covering 350 ha of land area in the Wilgamuwa DS division.

The beginning of a new rubber plantation

A meeting with beneficiaries of the Knowledge Bank

The ICDWF formed eight CBOs in four GNDs and trained 65 CBO members, including youth and women, to improve leadership, management skills and knowledge on sustainable agriculture. The project also encouraged them to take collective action to overcome their problems such as poverty, poor nutrition, unhealthy living conditions and low agricultural productivity. A Women's Farmer Federation was established with 51 women's farmer societies and around 1275 individual members. For the first time in Sri Lanka, a Women's Knowledge Bank was established to benefit women in the project area. This knowledge will

be disseminated to villagers in training programmes and consultations.

Technical knowledge on food dehydration, training on preparation of savoury foods and fruit juices and financial assistance were provided to ten individuals, including six females. A sales outlet was established at the Agrarian Service Centre in Hettipola, under the supervision of the Department of Agrarian Development. The surplus production of a variety of organically grown vegetables and fruits from home gardens of the members of women's farmer societies is sold in this outlet.

Environmental Impact

This project has carried out 100 hectares of on-farmland and 900 hectares of off-farmland soil conservation. Using the concept of agroforestry, earth bunds, debris bunds, SALT and contour ditches were established in 452 home gardens. Agroforestry has proved to be very effective in conserving the soil and improving its fertility in homesteads, while increasing farmers' income. The rubber plants were established in 11 hectares of uplands. Other tree planting activities were carried out using 20,000 plants covering 350 hectares and involving 1224 farmers families. With time, the trees will provide adequate canopy to reduce soil erosion and contribute to carbon sequestration.

Sustainable land management and water conservation practices have significantly impacted soil and water conservation and groundwater recharging. The improvement of agricultural productivity promises to give long-term benefits. In addition, six agricultural roads were developed.

Socio-Economic Impact

The ICDWF has supported developing cottage industries such as making millet flour and sweetmeats. The project also helped establish rice mills and mushroom cultivations. These cottage industries, mostly operated by women, have contributed to improving conditions of the households. In addition, enhancing the productivity of farmlands has provided tangible benefits to the community. The ability to earn an additional income by improved packaging and marketing of products in outlets outside the villages is a welcome change in the project area. But it must be recognized that ventures such as agroforestry take time to create a dent in alleviating poverty. Once the rubber trees are ready for tapping, the farmers would have a steady income as rubber prices have increased recently. For about five years, farmers can cultivate their usual seasonal crops in these lands.

Fruits and vegetables on offer at the sales outlet at Hettipola

As a result of the availability of irrigation facilities, 83 farmer families have benefitted significantly. They cultivate 136 hectares of land under irrigation. The assured supply of clean drinking water is expected to reduce waterborne diseases in these villages.

The average monthly income of the villagers before the project implementation was Rs. 17,284.00 (USD 105, March 2021) and the current monthly income after the project activities is Rs. 20,248.00 (USD 123). Farmers and the ICDWF are convinced that the initiatives taken will bear fruit in the future (These figures were calculated based on farmer savings and other in-kind developments).

The Knowledge Bank has proved its value as a means of providing technical information to beneficiaries. In addition, it also facilitates obtaining services of external resource persons for farmer training. Both useful traditional knowledge and new technologies are now accessible to the enterprising farmers through the Knowledge Bank. Microfinance facilities are provided to women through the CBOs to overcome poverty, initiate small businesses and improve farming practices.

Youth Engagement and Participation

The majority of the beneficiary community consists of youth. They were organized into several CBOs, which are managed by trained youth. Young community members took part in most project activities. The youth were trained in various aspects such as developing leadership and management skills. They were exposed to useful technical knowledge on efficient farming practices, soil conservation and organic farming. The project officers can boldly claim that they have empowered the youth and women to create a new future.

Gender Equality and Women Empowerment

A meeting to discuss ways to improve livelihood options

What is noteworthy about the ICDWF is that highly capable women lead it. They provide guidance and leadership to the members of the Women's Farmer Federation. All project activities are carried out after discussions with both male and female members of CBOs. This method enabled the project activities to be implemented with a high level of effectiveness. Women have received the benefit of training on various aspects related to farming, value addition to products, marketing and accounting and managing their household economy as well.

Sustainability

The community leaders and farmers have begun to buy into the idea that future prosperity is only possible by ensuring the conservation of the environment and using eco-friendly farming practices.

The micro-finance system introduced by the project focuses on ensuring the sustainability of project interventions. Women-led societies already have considerable savings. They have commenced supporting members by offering them micro-finance facilities.

The Knowledge Bank will continue to offer a valuable service in consulting farmers and offering them new knowledge to improve their livelihood options. The CBO's financial strength and household income promise to improve over time, enabling people to invest their savings in new ventures. A certain percentage of the profit from the sales outlet is used to provide micro-credit to members, on demand.

The water tank and the supply system are operated and maintained by the society of water consumers with fees levied from the water consumers.

Lessons learned

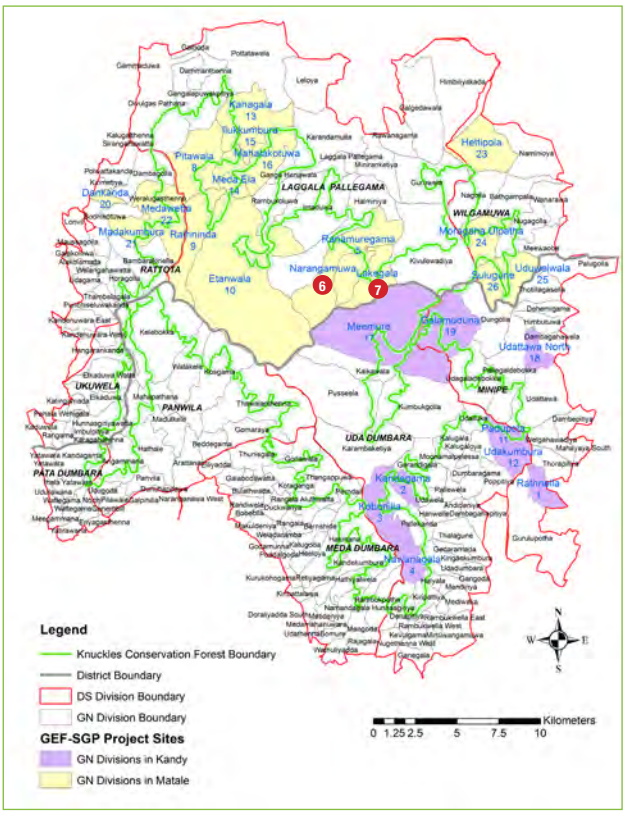
Social animation helps to activate the beneficiaries toward successful implementation of project activities. Attitude change and knowledge and skill upgrading would continue to improve people's livelihoods.

Multi-stakeholder coordination helped improve implementation and sustainability of the project as relevant village level government agencies got involved in decision-making and co-financing project activities.

Partners

- The Sri Lanka Export Development Board and The Coconut Development Authority: Provided training programmes and seedlings of minor export crops and coconut.
- The Rubber Development Department, Matale: Provided rubber plants and training.
- The Department of Agrarian Development, Matale District Secretariat, The Wilgamuwa Divisional Secretariat and The Wilgamuwa Agrarian Services Centre: Provided training programmes and fruit crop seedlings.
- Rotary Club, Matale: Provided a water purification system.
- One Tree Planted Organization, USA: Provided the funding to purchase fruit plants and forest plants.

Revitalizing Narangamuwa and Lakegala



Project No:	SRL/SGP/OP6/STAR/BD/2018/22
Grantee Organization:	Nirmanee Development Foundation
Location:	Narangamuwa & Lakegala GN Divisions,
SGP Contribution:	US$ 30,000.00
Cash Co-Financing:	
In-Kind Co-Financing:	US$ 2,200.00
Project Duration:	30 months
Focal area	Biodiversity

Background

Narangamuwa and Lakegala are two GN divisions situated in the foothill of the Lakegala in the Knuckles Mountain Range in the Laggala DS division of the Matale District. The population of the above GN divisions is 650 with 190 families. Before 1985, when shifting cultivation was banned, the main income source of the villagers was the cultivation of cardamom in the Knuckles forest and shifting cultivation. As a result, people lost their main source of income. The small-scale cultivations carried out illegally had to be stopped completely by 2010. It was in this backdrop that farmers started cultivating pepper in their homesteads.

Rice cultivation using outside inputs and poorly managed home gardens provided hardly enough income to make ends meet. The situation was further exacerbated due to the denudation of a large portion of arable land in the area and the deterioration of soil fertility and water quality. In the past, these two villages were well known for the availability of a variety of herbs used to formulate medical preparations used to treat people. A tremendous amount of indigenous knowledge related to traditional medicine and rituals is found in these ancient villages.

The Knuckles landscape has many attractions that would easily satisfy even the most demanding tourist. However, for the tourism industry to thrive, it is essential to develop on-site facilities, ensure visitors' safety, establish nature trails and have well-trained, knowledgeable tour guides.

Mr. Nimal Hewanila, Executive Director of Nirmanee Development Foundation (NDF), the key player of the project, realized that all would be lost unless something is done to restore the environment while improving livelihood options available to the community. This led to the formation of a CBO named Sri Naradapura Protection Organisation, which currently has a membership of 108.

Project Objectives and Key Activities

The project's main objectives were to reduce soil erosion, restore biodiversity and promote ecotourism and livelihood development. The implementers also emphasized the conservation of existing indigenous knowledge systems in the spheres of agriculture and health.

The efforts to convince villagers of the need to abandon wasteful cultivation practices and avoid using chemicals known to harm the environment were not easy tasks. Attitude change is never easy at the best of times, and farmers were reluctant to give up their old ways of farming. Thus, the NDF had to have frequent discussions with farmers to get their support and active participation.

Control of soil erosion, an essential strategy for sustaining productivity, is also an activity that does not provide visible, tangible benefits to the farmer. This is a huge hurdle in attempts to convince farmers to put up soil conservation bunds and drains while they have to put aside attending to day-to-day tasks in the farmland or the household. The NDF proposed to conserve 50 hectares of land by applying soil conservation measures. The age-old way of farming had to be changed as well.

One of the most outstanding achievements of the NDF was its ability to convince farmers to adopt SALT (Sloping Agriculture Land Technology) and put up stone bunds for soil conservation. Around 1600 m of stone bunds and 1600 m of the SALT system were constructed with the active participation of 50 families. A small-scale check-dam of 1000 m was built with the involvement of 40 families to control run-off from uncultivated lands eroding the soils in lands lower down the slope.

A house converted to serve as a homestay unit

It is evident that ecotourism development can only occur in a pristine environment coupled with high scenic beauty. The project upgraded the facilities available in seven homestays providing quality food and accommodation to tourists in the Narangamuwa village. A website (Knuckles Heritage: http://knucklesheritage.org/) was created to attract tourists to the area.

Several livelihood development activities were implemented in the area, and cultivation and proper maintenance of export agriculture crops, namely pepper, turmeric, and ginger were promoted. Advanced crop production technologies of

these crops were given to 35 farmers. Production of white pepper, which fetches a higher market price compared to black pepper, was promoted by training five persons. Equipment needed to prune shade trees and two ovens to dry spices such as pepper, cloves and cardamom were made available to beneficiaries. These ovens are owned and managed by the CBO. Over 100 families in the two villages use the ovens to dry spices and a range of vegetables. Safety equipment needed to climb fishtail palms was provided to ten persons.

A spice dryer donated to the beneficiaries

The home garden improvement was carried out successfully with community participation. Planting material of fruit plants was given to 150 beneficiaries. The beneficiaries were also given 1600 horticulture plants to develop their home gardens. A community forest of 100 hectares consisting of nearly 3000 forest plants (Jak, kitul and mango) was established in Horowyaya, which is located in the Knuckles Conservation area. The idea was to regenerate the soil quality of a land previously used for *chena* cultivation. This activity was carried out in collaboration with the Forest Department and the active participation of farmers. Four acres of traditional rice and three acres of organic green chilli were also planted.

To conserve plants used in indigenous medicine, a herbal garden 2 hectares in extent was established in the Narangamuwa school premises. The project established about 3000 plants. Some of the plants in the collection were threatened species of herbs, required to make medical preparations according to the ayurvedic tradition. Many of these plants are widely used for treating snakebite, fractures of bones and eye treatment.

Beneficiaries being trained on the use of soil conservation practices

Having the herbal garden in the school premises is an effective means of passing over this body of indigenous knowledge to future generations. The project also identified living repositories of traditional knowledge within the community, and documented best practices to conserve them for posterity.

The NDF has commenced documenting a Bio-cultural Community Protocol (BCP) on shifting cultivation. This document will contain information about farmers, the seed banking system, indigenous food recipes, hunting methods, cultivation practices and rituals.

Environmental Impact

The villagers have become aware of the positive impact of replanting the hitherto abandoned lands with fruit crops and native species of trees. They recognize that reforestation and soil conservation are effective means of preventing soil erosion. About 50 ha of land was stabilized through soil conservation. The streams have started to carry clear water and not muddy water laden with soil particles. Improvements in soil fertility may take some time, but a visible impact is already seen in the home gardens. The new eco-friendly cultivation practices have halted the accelerated soil degradation observed before the implementation of the project. The community forest established in 100 hectares has already started to make a positive impact on the biodiversity.

Teaming up to constructstone bunds to restrict run-off from sloping lands

The new spice dryers have helped reduce the dependence on the forest for obtaining firewood. These ovens have a drying capacity of 50 kg per hour and are heated by burning paddy husk, which is freely available in the area.

Socio-Economic Impact

The attitude change of villagers was one of the most significant achievements of the project. People who showed lethargic attitudes towards changing their customary way of life have realized the need to adopt new technologies and develop more long-term strategies for conserving and sustaining the environment for posterity. The livelihood options opened up by the project have given the villagers new hope and improved their household finances. Small scale ventures to add value to agricultural products have created a high degree of enthusiasm among the women who did not have the necessary equipment and access to outside markets. Producing good quality products after training has opened up new markets.

Conservation of indigenous knowledge available with the older people in the village, especially in the area of traditional treatment of a variety of unavoidable maladies in a rural setting such as snake bites, fracture of bones and eye ailments has to be considered as an invaluable asset to restoring people to health. In addition, this body of knowledge is a part of the social capital belonging to everyone.

Youth Engagement and Participation

Five young tourist guides have commenced networking with other projects in the landscape in the ecotourism sector to work collectively. It provides an income generation opportunity for the village youth.

Gender Equality and Women Empowerment

Both men and women benefited from the project equally. There were about 150 female beneficiaries in this project. Gender equality has been ensured in all community groups formulated to do the project activities. Women were encouraged to engage in cash crop cultivation and home gardening for income generation for household expenditure.

Sustainability

The NDF has established a network of similar projects in the Knuckles landscape involved in ecotourism-related activities. The CBO will cooperate with the Ministry of Tourism to expand opportunities in the tourism sector for this network. This networking initiative will be helpful to attract more tourists to the area.

The two dryers established by the project have proved to be very useful. The farmers use them to dry pepper, turmeric, grains and coconut used for oil extraction. Steps were taken to improve *kitul* tapping. Ten sets of *kitul* tapping equipment were donated to people engaged in the trade.

Lessons learned

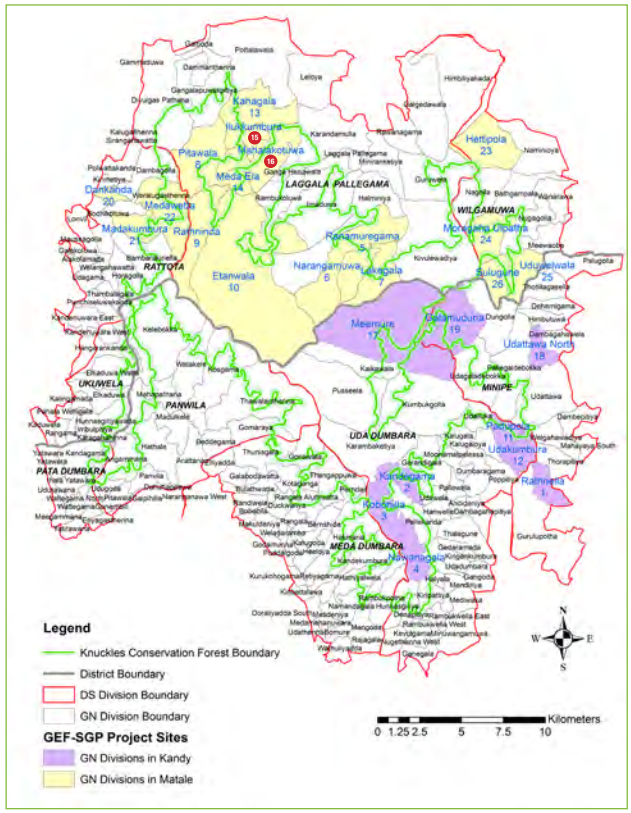
For the sustainability of the projects, good community mobilization is essential. Apart from that, the contribution from government officials has been helpful to reach expected targets. Further, the technical consultants of the GEF-SGP provided valuable inputs for conducting soil conservation, ecotourism and reforestation measures. These technical inputs have contributed to maximizing the expected outcomes.

The projects should avoid people who join the project activities for immediate benefits, at the initial stages. It is important to identify true beneficiaries who are willing and capable of carrying out the project activities and join the project with a long term focus.

Partners

- The Department of Export Agriculture (DEA), Matale: Conducted several training programmes on organic agriculture and value-addition to agricultural produce.
- The Laggala Divisional Secretariat: Assisted in project discussions, activity initiations and implementation of project activities.
- The Forest Department: Collaborated to establish the community forest.
- The Institute of Industrial Techno-Management (Pvt) Ltd: Compiled the Business & Sustainability Plan.
- Other projects in the landscape: Networked tourist guides to work collectively.

Restoring Degraded Lands in Illukkumbura and Mahalakotuwa



Project No:	SRL/SGP/OP6/STAR/LD/2018/23
Grantee Organization:	Rangiri Thakshana Piyasa
Location:	Ilukkumbura & Mahalakotuwa GN Divisions, Laggala DS Division, Matale District
SGP Contribution:	US$ 30,000.00
Cash Co-Financing:	US$ 5,000.00
In-Kind Co-Financing:	US$ 34,900.00
Project Duration:	20 months
Focal area	Land Degradation

Background

Illukkumbura and Mahalakotuwa are two GN Divisions located in the hilly areas of the Knuckles landscape belonging to the Laggala Divisional Secretariat in the Matale District. The current population of the villages is 120. At present, mostly elderly people reside in the villages as the youth have migrated to towns in search of job opportunities.

Villagers cultivate rice as well as many vegetable crops in the home gardens. However, what is produced in these lands is hardly enough to satisfy the villagers' day-to-day needs. Poorly managed lands have only a limited capacity to produce even modest crop yields. Most of the farmers face water scarcity during the dry season, and intense dry winds occurring in the months of June, July, and August prevent carrying out any agricultural activities.

Rangiri Thakshana Piyasa (RTP) is an organisation dedicated to improving the living conditions in these villages. This NGO is headed by a Buddhist monk, Ven. Galahitiyagama Dhammarathana Thero. The village has another CBO named Illukkumbura Farmers' Organisation, with a membership of 30 families. This organization has been active since 2018.

Project Objectives and Key Activities

The main objectives of the project were to:

- introduce sustainable land management practices to conserve and ensure the productivity of uplands
- increase the biodiversity of the area through reforestation
- preserve ancient cultural heritage of the area and
- promote handicrafts and cottage industries to improve people's livelihoods.

Main activities of the project were focused on mobilizing villagers to desist from using chemical fertilizer and pesticides, adopting organic farming practices, restoring degraded lands, establishing and operating eco-friendly home gardens, collecting and documenting traditional knowledge, encouraging the cultivation of suitable crops in paddy fields during *yala* and introducing water-saving technologies for home gardening. These activities required giving training to farmers on various technical aspects related to producing organic fertiliser. The project also sought to expand the range of crops grown in the home gardens. This process was facilitated by distributing quality seeds and planting materials of fruits and vegetable crops. The project also promoted the cultivation of cash crops to improve the farmers' livelihoods.

Improving accessibility to the villages

Before the project, farmers never bothered to stabilize their soil by putting up soil conservation bunds. Therefore, farmers first had to be trained on the essential technical aspects of controlling run-off and channelling the water safely down the slope to facilitate this process.

Storage water tanks to be made available to beneficiries

Maximizing water use efficiency with drip irrigation

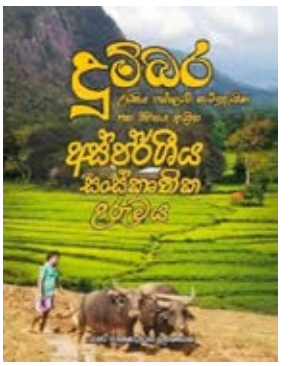
New technology was also introduced to improve agricultural productivity in the farmlands. Drip irrigation, which is considered an excellent means of improving water use efficiency, was introduced to 20 farmers. They were given the necessary technical know-how and equipment such as drip tubes and storage tanks. The drip systems were put to good use in cultivating cash crops.

The reforestation programme could be implemented only after producing the required seedlings of tree species such as *kumbuk (Terminalia arjuna)* and *mee (Madhuca longifolia*). A plant nursery was established to produce enough seedlings to meet the project's requirements. This nursery also provided 1100 plants to the GAFEC organization, another GEF-SGP project grantee, for their project implemented in Midlands Estate to support the reforestation in that area.

Village women tending the plant nursery

In addition, reforestation with about 5000 native plants was carried out in the Redbanagama village.

The project emphasized the importance of conserving the traditional knowledge base available with the community and published as a book named Dumbara Asparshiya Sanskruthika Urumaya. It contains knowledge on traditional medicine and medical practices, rituals, chants (*mantras*), folklore, mythology and a wealth of information on ancient villages in the Knuckles landscape.



Ven. Galahitiyagama Dhammarathana Thero presenting the book on traditional knowledge in the Knuckles area to H.E. Mahinda Rajapakshe, Prime Minister of Sri Lanka

Women were trained to manufacture handicrafts such as reed mats, baskets, boxes and various containers for storing household items. These items are highly marketable and can be sold to tourists and visitors to the area. The project established a sales outlet dedicated to selling handicrafts in Rathninda.

Environmental Impact

Controlling run-off and preventing soil loss from upland farming areas coupled with reducing splash erosion have proven to be effective in conserving the soil in an area of 200 ha. A small reservoir in Illukumbura was de-silted to improve its water storage capacity. This benefited 24 farmers cultivating 6.9 ha of agricultural land. An eroded stretch of road was repaired to control heavy soil erosion and improve transportation of goods into and out of the project area.

The reforested area in Redbanagama was about 250 ha. Organic farming has reduced pollutants contaminating downstream water bodies. Drip irrigation has enabled to increase water use efficiency and improve the productivity of home gardens. Seventy-five families were trained on organic fertilizer production and environment-friendly home gardening techniques. They were also provided with tools and seeds to develop their home gardens.

Cash crops grown in paddy fields to enhance the farmers' income

Socio-Economic Impact

Offering services to local and foreign visitors has become an important source of income for villagers. Cultivating cash crops using good agricultural practices has proved to be highly effective in enabling villagers to lead a healthy lifestyle and ensured a steady income by selling the surplus. New livelihood avenues were made available to villagers as a result of promoting the manufacture and sale of handicrafts. Land productivity has increased especially because of improvements in home gardening methods. Turmeric cultivation was promoted through the project. The profitability from sales was exceptionally good because farmers were able to capitalize on the situation which prevailed in 2020 on account of banning of turmeric imports to the country.

Youth Engagement and Participation

Priority was given to youth, women, and low-income people in partnerships and decision-making in the project activities to ensure better transparency, sharing of responsibilities, achieving maximum community participation and distributing project benefits equally among the community.

Gender Equality and Women Empowerment

In home gardening and handicraft making, the majority of the beneficiaries were women. Most of these artisans work as a group at the Village Community Centre, with the added benefit of strengthening bonds among families.

A training session in progress

Sustainability

Village women trained to make handicrafts using Ola leaves now sell them to tourists who visit Pitawala and surrounding villages. A group of ten women are engaged in the business. The required raw materials are obtained within the Matale district. A part of the funds collected is utilised to expand the business and to further strengthen soil conservation and home gardening activities and also support the production of seedlings and planting material

Lessons learned

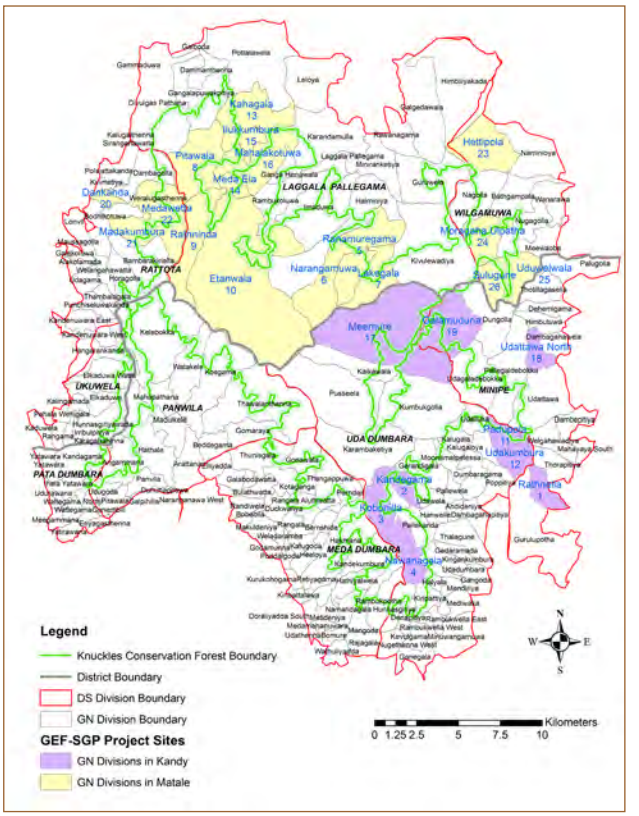
It is essential to have technical consultations on biodiversity, soil conservation and reforestation and mobilize the community effectively to get the famers' maximum contribution to achieving the expected outcomes of the project.

Partners

- The Forest Department: Consulted the project to identify suitable lands for reforestation in the Redbanagama village.
- Midland Estate, State Plantation Corporation: Carried out the reforestation of denuded lands and maintained established plants.
- The Department of Cultural Affairs: Supported the documentation of traditional knowledge.
- Hadabima Authority: Provided 1000 jak plants for the home gardens.

Capacity Building and Knowledge Management

Facilitating and Coordinating the Capacity Building and Knowledge Management of Projects Operating in the Knuckles Landscape



Project No:	SRL/SGP/OP6/STAR/CD/2017/04
Grantee Organization:	Sri Lanka Environment Exploration Society (SLEES)
Location:	Kandy, Matale Districts
SGP Contribution:	US $ 50,000.00
Cash Co-Financing:	US $ 18,102.00
In-Kind Co-Financing:	US $ 11,843.00
Project Duration:	48 months
Focal area	Capacity Development

Background

The GEF SGP programme has adopted a landscape approach in its sixth Operational Phase following the Community Development and Knowledge Management for Satoyama Initiative (COMDEKS) approach. Accordingly, the programme was focused on three ecologically sensitive areas in Sri Lanka; one of them being the KCF and its buffer zone. The Knuckles Conservation Forest (KCF) and its buffer zone were identified as the landscapes to develop using adaptive landscape management strategies for socio-economic resilience. Landscape-scale conservation and management were emphasized as a strategy for project interventions to be carried out in the Knuckles area by selected CBOs and NGOs.

The Knuckles mountain range lies in the Central Highland of Sri Lanka, covering the districts of Matale and Kandy. In addition to its unparalleled aesthetic beauty, this area has been able to attract considerable scientific interest because of its diverse climatic conditions and the richness of flora and fauna. Although the mountain range covers only 31,305 hectares, which amounts to a mere 0.03% of the island's total area, many threatened animals not found elsewhere have been recorded in this area. Moreover, the range of habitats includes dry evergreen forests, montane forests, sub-montane forests, dry and wet pathana and savannah grasslands.

The GEF-SGP provided grants for 13 projects presented by NGOs and CBOs under the OP6 to address the GEF focal area issues such as climate change adaptation, conservation of biodiversity and prevention of land degradation. These projects mobilized the communities living in the area to carry out activities such as reforestation, soil conservation, promoting home gardening, eco-tourism and adopting ecological agriculture practices such as minimizing chemical inputs in agriculture. These individual projects had to coordinate their efforts to bring tangible benefits to communities while restoring the environment to its former richness in biodiversity. Hence, networking among the various organizations while developing their capacities was crucial to ensure the success of the projects.

Knowledge management and capacity building were identified as vital elements to be emphasized from project formulation and implementation to evaluation and documenting of best practices. The main idea was to promote identifying, capturing, facilitating and sharing innovative technologies and lessons learned while implementing SGP interventions.

The landscape-based conservation approach introduced to the project proponents was a new concept. It required the training of implementers to work as a team in carrying out conservation work within the landscape. Sri Lanka Environment Exploration Society (SLEES) facilitated conducting training workshops and promoted networking among the different project proponents from the beginning to the end of the projects.

Project Objectives and Key Activities

The project's main objectives were to facilitate knowledge exchange among the NGOs and CBOs, promote their capacity development and facilitate replication and scaling up of best practices and innovation. The project strived to improve awareness of the NGOs and CBOs on the GEF focal areas and the GEF SGP country programme and its strategy and results. Documentation of best practices and sharing them across a wider platform and strengthening partnerships among all stakeholders, creation of a wide network of CBOs that can serve as an active constituency for positive dialogue with the government on sustainable development and policymaking at the national level was another objective.

SLEES carried out several capacity development and knowledge management initiatives, ultimately linking all projects that would work towards achieving a common goal: conservation of the Knuckles landscape.

A Project Initiation Workshop was held for members of NGOs who expressed their interest in submitting project proposals. This one-day workshop introduced the landscape conservation approach, expected results and the project typologies in the three landscapes. About 130 participants representing 70 NGOs and CBOs participated in the workshop.

A two-day Project Development Workshop for 18 selected grantees was held to build their capacities in critical areas such as identifying project results, progress reporting, financial reporting and monitoring requirements, and data analysis and communication needs for GEF-SGP projects. Further, baseline targets were set for each landscape with the support of relevant experts. Two residential workshops of 2-day duration were held to support the development of new projects. These sessions covered important aspects such as awareness of the landscape approach, issues related to land degradation, the SGP objectives, gender equity, logical framework formulation and proposal writing. SLEES organized five mini-workshops in Kandy and Matale to facilitate capacity building of the grantees and networking of the grantees across the landscape, review the grantee NGOs' progress and prepare a standard baseline questionnaire with the support of the relevant experts. Furthermore, the workshops facilitated identifying gaps and

periodically sharing knowledge and resources. Further, steps were taken to solve problems observed in individual projects, and arrangements were made to obtain permissions or support of government authorities needed to carry out planned project activities.

Biodiversity training organized by SLEES

A residential workshop was organized at the Information Centre in Pitawala Pathana, by the Forest Department (FD). The purpose of the workshop was to facilitate the collaboration of GEF-SGP projects with the officers of FD. Four one-day workshops were conducted for the grantees once the projects got underway. The workshops were held in the District Secretariat, Matale, with the participation of the District Secretary, higher officers of the Forest Department, the Divisional Secretaries exercising authority over the KCF, officers of the Land Use Planning Department, and representatives of grantee organizations. The idea was to monitor the progress of planned activities.

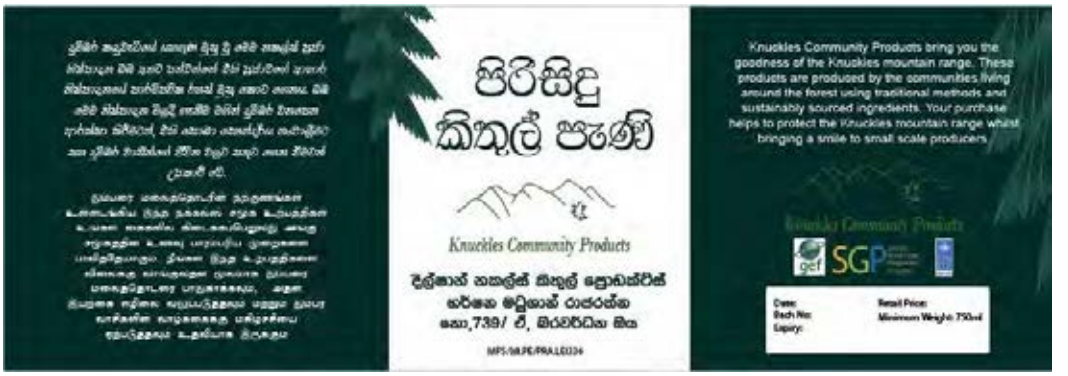
SLEES organized a two-day residential training programme on biodiversity in the KCF to train 22 young individuals from beneficiary communities and project staff. Herpetofaunal Foundation of Sri Lanka carried out the programme.

A workshop was held to train the grantees on eco-tourism-related activities. The workshop covered topics such as tourism in the global context, identifying unique experiences that could be offered to the tourists and good practices and standards of homestay operation. The grantees were requested to make site-specific suggestions for implementation related to best practices in eco-tourism.

Another workshop was held in Colombo to train the grantees on global trends in eco-tourism. This workshop was conducted for 21 individuals by an international expert on eco-tourism from the Netherlands and Lanka Social Ventures (Pvt) Ltd. A two-day residential workshop was held in Sembuwatta Polo bungalow, Elkaduwa, Matale, to share the experiences of the Senior Superintendent of Elkaduwa Estate on the formation of Estate Worker's Housing Corporative Society and the establishment of the world-famous Sembuwatta Lake Nature Tourism Project. The workshop's purpose is to create awareness among project grantees on the success of social ventures and share the experience. Twenty individuals participated in this workshop.

A two-day training programme on pepper and turmeric cultivation and post-harvest technologies was held at the Export Agriculture Research Station, Matale. The training provided hands-on experience on harvesting, processing and value addition of pepper and turmeric. Fifty-eight individuals participated in this workshop. A training programme was organized to help improve the production of spices, peanuts and other cash crops grown in the area. Special attention was given to value addition, packaging and labelling. Forty persons participated in this programme. Another training programme on food technology was held at the Food Research Unit, Department of Agriculture, Peradeniya.

A network meeting organized by SLEES



The standard logo and label for the products made in the Knuckles landscape

The training programme covered peanut butter production, dehydration of fruits, green leaves and vegetables, and production of fruit juices and snacks. Different machines used in the food production industry were introduced to the participants. Technical instructions on drying machines and bottling techniques, preserving methods and packaging techniques were also explained. An online workshop on Participatory Guarantee System (PGS) certification was conducted in partnership with Good Market (Gte.) Ltd., Colombo, to understand the PGS certification process better. The project designed a standard logo and label for the products made in the Knuckles landscape. At present this label is used within all the 13 projects operating in the landscape. The logo depicts an image of a frog to highlight the newly identified frog species endemic to the Knuckles Conservation Forest. This frog was discovered by the Herpetological Foundation of Sri Lanka.

SLEES made 40 field visits to the project sites and provided the necessary guidance to ensure achieving of set goals. Along with technical advice, the grantees were given required training by experts in various fields. Due to the mountainous nature of the Knuckles landscape and how the projects were dispersed throughout the landscape, travelling to them was extremely difficult. Some project sites did not have motorable roads, and often a 3-4 km hike was necessary to reach them. Therefore, a lot of time was spent visiting each location. how ever, SLEES organized multiple field visits to create awareness and provide advice to grantees.

An expert offering advice and guidance to grantees

The project faced travel restrictions due to the curfews imposed due to the Easter Sunday Attacks and the COVID-19 pandemic related lockdowns. However, SLEES coordinated with the NGOs through telephone and other teleconferencing applications, and carried out the project activities effectively.

Photographs, video clips, minutes of meetings and reports of field visits related to the achievement of significant milestones were incorporated into a database uploaded to the GEF-SGP official website (www.gefsgpsl.org). To assess the impact of the projects, SLEES carried out a comprehensive baseline survey, which helped make comparisons between the pre-and post-project situations. An online newsletter was disseminated among stakeholders to record the progress of key events taking place in all three landscapes. Altogether four volumes and 38 issues of this newsletter were published. An official GEF-SGP website was developed to share, network, and showcase best practices and innovations. This GEF-SGP website is the leading information portal of the GEF-SGP Sri Lanka, and has a database of all GEF-SGP projects implemented in Sri Lanka. During the entire project implementation period, the website has continued to update Its database and keep all concerned parties aware of the progress in achieving project objectives. The positive impacts made by the projects were documented and disseminated through multiple modes such as social media posts, YouTube videos, newspaper feature articles, case studies, photo stories, video documentaries

and web-based sharing platforms such as the GEF-SGP's national website. High-quality video stories were created for all projects operating in the Knuckles landscape. These videos portrayed the project activities, results and testimonials of the village communities. SLEES sponsored the Sri Lanka Status Report on Sustainable Nitrogen Management compilation, published by the Ministry of Mahaweli Development and Environment. The book was launched in the "Sri Lanka NEXT - A Blue Green Era 2019" Conference and Exhibition held at the BMICH. Case studies of the 13 projects have been prepared to record the project activities, impacts, results and lessons learned. Five-hundred leaflets about the GEF-SGP work carried out in the Knuckles landscape have been published. Pull-up banners for each of the 13 projects showcasing the activities were prepared for World Mountain Day 2019, and another six pull-up banners were prepared for World Tourism Day- 2020. These banners were displayed, and the leaflets were disseminated at important events carried out with project proponents. SLEES sponsored the T-shirts and caps of participants of the International Mountain Day celebrations in 2019 and 2020. SLEES also contributed to set up two stalls at the Asia Pacific conference of the Association for Tropical Biology. The object was to raise awareness of the global community on work carried out by GEF-SGP towards sustainable land management and conservation of biodiversity of Sri Lanka.

Winners of the Women's Entrepreneurship Awards

Mountain Day National Celebration in 2019

In order to give due recognition and share the efforts made by the SGP Sri Lanka in addressing global environmental issues with the wider community, SLEES nominated initiatives for six national and international competitions and awards such as the Equator Prize, ISTF (International Society of Tropical Foresters) Innovation Prize, Momentum for Change Award, and Women's Social Entrepreneurship Award. Two female grantees showcased their project work to compete for this award.

Environmental Impact

Water and soil quality analysis of the project locations of the entire landscape was carried out by the Centre for Water Quality and Algae Research of the University of Sri Jayawardanapura under the leadership of Prof. Padmalal Manage. This data will be very useful to evaluate the environmental impact of the projects, and can be used as a baseline for future projects.

The GEF-SGP had set landscape-level conservation targets for the projects implemented in the Knuckles landscape. These targets were 12290 ha of community conservation areas, 2030 ha of reforestation and 1490 ha of soil conservation and 1510 ha of land improved by using eco-friendly land use practices. SLEES supported these activities by conducting capacity-building programmes. Many good practices shared among project grantees and the communities served by them have raised awareness of the importance of environmental conservation and practising sustainable agriculture.

Socio-Economic Impact

The project has facilitated the capacity development of NGOs and CBOs operating in the area. The project has developed capacities in biodiversity conservation, livelihood development, product development of about 4486 individuals, while the number of direct beneficiaries of capacity development programmes amounted to 1064 individuals. Coordinating efforts of project staff with the relevant government officials has made it possible to improve the livelihoods of many communities. Although the pandemic imposed severe restrictions on implementing various activities, project staff were guided to make adjustments to ongoing work and determine alternate means of overcoming obstacles.

A discussion with the community

The standard logo designed for use with products marketed to tourists and other visitors has helped establish a unique identity or a brand for all items produced in the project area. This marketing strategy is expected to enhance sales and bring more income to the communities.

Youth Engagement and Participation

Many capacity building programmes on biodiversity identification, project implementation, photography, videography and the use of social media, marketing and teleconferencing were targeted at youth who would be the main contenders for sustaining interventions initiated with long term targets related to environmental conservation.

Gender Equality and Women Empowerment

In all workshops carried out to support and empower project grantees and communities, gender equality was ensured at all times. Altogether 2385 females and 2945 males have benefitted from the project.

Sustainability

The project encouraged and assisted the grantees to network, scale-up, and enhance partnerships with government institutions, the private sector, and various resource persons. Now the grantees can link up and collaborate with these institutions and experts to obtain training opportunities, technical support and other resources. Knowledge sharing and capacity building would create a situation conducive to ensuring the sustainability of project interventions.

Lessons learned

The collective efforts made in capacity building of the SGP initiatives by the project have demonstrated significant success in achieving objectives. Capacity enhancement and technical facilitation should begin at the early stages of the project implementation process. This should then be followed by knowledge management and sharing of experiences. Participatory decision-making and sharing of experiences and best practices can produce far-reaching benefits.

Duplication of efforts, inconsistency in the approaches used and poor understanding of policy implications need to be avoided. Expertise available with a given grantee needs to be made available to others along with resources that may be put to good use by another.

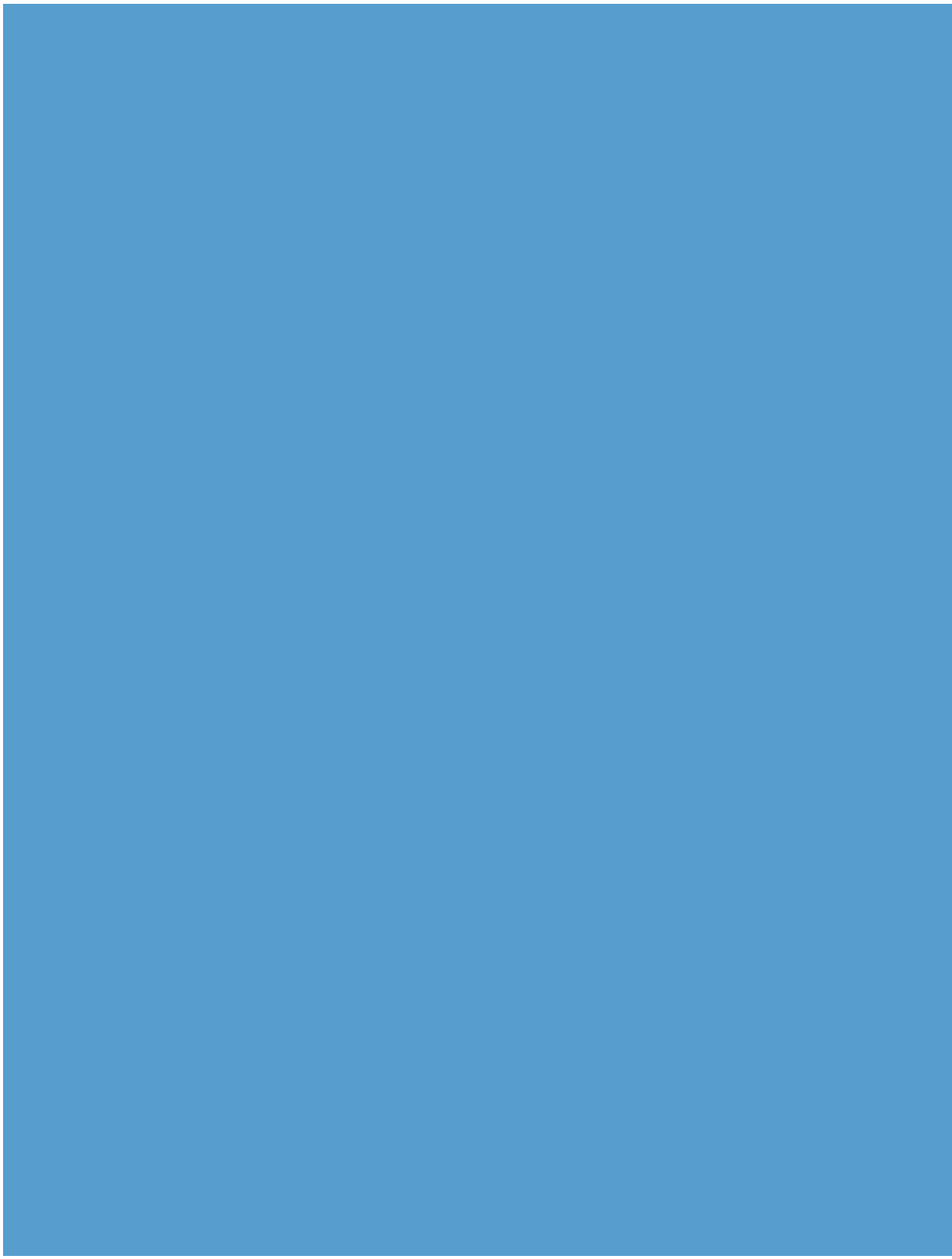
Collective effort and team work are required when making significant changes to a complete ecosystem. Isolated attempts make changes in a relatively small area may not be effective in conserving biodiversity in an extensive land area like the KCF.

Continuous support may be required to sustain positive changes in the management of the KCF as a complete ecosystem. This would require constant monitoring by relevant government officials, community leaders and NGOs and CBOs operating in the area covered by all 13 projects. Roadblocks encountered by village level organizations need to removed so that they will continue to thrive in future.

A training programme on value addition to community products

Partners

- The Centre for Water Quality and Algae Research, the University of Sri Jayewardenepura: Conducted water and soil quality analysis of the entire landscape.
- Surakshi, a Colombo-based knowledge management team: Provided support to organize some workshops for the grantees.
- The Forest Department: Provided opportunities to host meetings to facilitate partnerships for grantee projects.
- Sembuwatta Lake Nature Tourism Project of the Elkaduwa Estate, Lanka Social Ventures (Pvt) Ltd and SquareRoot Consulting (Pvt) Ltd: Partnered with SLEES to disseminate knowledge on eco-tourism.
- Good Market (Gte.) Ltd. and The Export Agriculture Research Station, Matale: Supported to educate beneficiaries on PGS certification, production and value addition of home garden products and spices.
- MRM Media (Pvt.) Ltd: Partnered with SLEES to produce short videos for the projects.



Policy Impact

Policy Impacts from Knuckles Landscape

The UNDP/GEF/SGP provided grants to 14 small projects operating within the Knuckles landscape. Of this, two projects covered the whole of the Knuckles landscape. The other 12 projects operated locally, addressing the needs and issues found in one or two villages. The focal areas were initiatives to minimize land degradation, enhance biodiversity and promote eco-friendly agriculture and eco-tourism. The improvement of the livelihoods of the community was a prime objective.

The Ministry of Environment and the Agricultural Ministry have recently adopted a new Environmental Policy and an Agricultural Policy. These two policy documents emphasize biodiversity conservation and land degradation as high priority areas. However, these documents have made no significant impact at the grassroot level. The projects faced some challenges in relation to policy implementation in the Knuckles landscape. Fortunately, in some occasions these barriers were overcome by adopting new operational mechanisms. Some such success stories deserve special mention.

The best practices used by the CIIKS in Kandegama, Kobonilla and Wadawalakanda in preventing forest fires and increasing agricultural production can set new standards in achieving healthy collaboration with various government organisations dealing with common issues affecting the community.

While encroachment and poaching are legal issues, empowering the community to choose appropriate alternatives can facilitate the work of government officials and simultaneously improve the livelihood of the villagers.

Healthy collaboration between the relevant government agencies and the CBOs will be the best possible option to solve many perennial problems occurring at the grassroots level. For example, the FD has undertaken to provide funding for the maintenance of the fire belts annually while the farming community will have the two-fold benefit of averting negative consequences due to setting fire to dry vegetation and be able to earn some additional income. In addition, the establishment of an information sharing system on forest fires among community and the government organizations is another success story which

can be extended to other locations as well.

An example of a successful project intervention was the development of a cage to protect the sap of the fishtail palm from monkeys. This innovation too can be replicated in other locations.

As a result of recent discoveries made by the HFS in the KCF, the number of point endemic flora and fauna species has been elevated to 25 species with the new snake discovery of *Aspidura desilvai* and *Rhinophis gunasekarai*. These findings have shown the need for further expansion of academic studies in the landscape. Further, these findings alone were enough to convince the relevant authorities to pay serious attention to the cause of conserving the biodiversity of the KCF. As a result of several discussions and awareness programmes, a planned road expansion project was revised to minimize environmental impact. In the future, any construction projects will be compelled to consider the need to avoid destroying or disturbing sensitive biodiversity hotspots in Sri Lanka.

The HFS shared information collected by the project with the Forest Department to facilitate the management of biodiversity hotspots. Moreover, the HFS suggested several eco-friendly structural modifications to retaining walls and drain systems on both sides of the road. These suggestions have been accepted and adopted by the Road Development Authority.

The Sri Lanka Police has identified the value of the lifeguards trained by the CRPC at Meemure. The police currently insist that a lifeguard be present when tourists engage in water sports. In the future, offering this valuable service would be formalized by the Udadumbara Divisional Secretariat and make it conform to government standards.

The development of tourist destinations has to be achieved by analysing the available social, cultural, natural and economic resources. Moreover, tourist destinations can be branded with their own unique nature experience, which would help to attract tourists with different tastes or requirements. The quality standards applicable to homestays and the service they provide have to be upgraded to match expectations of foreign and local tourists. This will facilitate the ecotourism industry and improve the livelihoods of the community. All relevant governmental agencies, NGOs and CBOs operating within the KCF need to have strong linkages so that the entire ecosystem is protected effectively.

The construction of the entrance gate and the boundary wall at Pitawala Pathana was achieved only as a result of collaboration between two organizations i.e. The Forest Department and the CBO Dumbara Mithuro. This shows that healthy interorganizational collaboration is a prerequisite to successful project implementation. The Forest department also collaborated with a CBO named Nirmani Development Foundation to establish a community forest in Howwayaya. These are healthy trends which need to be continued in the future and expanded as well.

The PLDF collaborated with the Sri Lanka Standard Institute to develop the quality standard for fishtail palm treacle. In addition, this CBO worked closely with several governmental and non-governmental organizations which helped to obtain more funds to complement the project work.

Grama Abhiwurdhi Foundation for Environment Conservation in the Midlands Estate in Rattota, which belongs to the State Plantation Corporation, demonstrated the advantages of giving autonomy to the management of estate plantations to increase productivity while preserving the environment. This kind of collaboration should be upscaled in other state plantations so that the land productivity can be increased while uplifting the livelihood of the people living in these areas.

Numerous studies and experiences relevant to improving the prevailing conditions in the Knuckles Landscape have been documented and published by SLEES for use by policymakers. This information and documents have catalyzed the policymakers to make important decisions relevant to the KCF landscape.

The NUEF project at Rathna Ella has demonstrated the importance of having a management mechanism to safeguard the environment with community involvement linking it to livelihood development activities through eco-tourism. The FD had a key role to play in supporting initiatives taken by the CBO. This led to success in curtailing the conduct of illegal activities within the area.

The Women's Farmer Federation Sithamu Kantha in Hettipola, established by the CBO the EPSKMS, with 51 women's farmer societies and around 1275

individual members, is another huge success story. This organization is helping small scale entrepreneurs with micro-financing.

The Women's Knowledge Bank has been instrumental in providing various kinds of training and support to enterprising farmers. Having access to the best of traditional practices and modern technology has enabled the farmers achieve higher levels of sustainability and enhance productivity.

This project also demonstrated the importance of collaborative work with various line agencies and communities to secure co-financing. In general, all the projects implemented in the Knuckles landscape demonstrated the importance of product improvement, market channel development and adoption of improved technologies and combining these with the best of traditional practices. The involvement of private sector enterprises in project activities can significantly expedite the process of transforming small businesses into more viable ventures capable of competing with other businesses outside the confines of the villages. Village level entrepreneurs need to be exposed to value addition technologies, better packaging and branding of their unique products.

Replication and Scaling up

Replication and Scaling up

There are several significant outcomes from all the projects implemented in the KCF landscape which can either be replicated or upscaled in the future. They may be useful for developing new projects or be used in subsequent phases of existing projects.

For example, the wealth of knowledge gathered by the Arunalu Community Development Centre on various aspects related to home gardening has already been shared with other organizations. Further, the Central Province Tourism Board has planned to implement the eco-tourism sub-activity of this project in eight other GN Divisions with the collaboration of the Rajarata University of Sri Lanka. The eco-tourism models developed by the NEUF in Rathna Ella, the CRPC in Meemure and the GAFEC in Midlands Estate could be successfully replicated in similar destinations with slight modifications to suit the relevant location. However, having clear strategies for development at the outset would be vital to achieving success in attempts to upscale such projects. Such strategies need to properly assess human, environmental and physical resources available with the tourist destination.

The monkey-proof protective cage has already become popular in various villages, and is planned for upscaling with the support of the Udadumbara DS office.

The forest fire information sharing mechanism using IT is another successful model that can be successfully upscaled in all areas prone to spontaneous or man-made fires.

The lessons learned by the projects operated within the KCF can help avert many constraints in future projects having more or less similar objectives. At the same time, successful strategies could be implemented in larger projects such as the project entitled "Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities residing in the vulnerable river basins, watershed areas, and downstream of the Knuckles Mountain Range Catchment of Sri Lanka." This project is implemented by the Ministry of Mahaweli Development and Environment Sri Lanka (MMD&E), International Centre for Research in Agroforestry (ICRAF), Nairobi, Kenya, and International Union for Conservation of Nature Sri Lanka Country Office with funding from the Green Climate Fund (GCF). This project will enhance the ability of populations, especially the smallholder subsistence farmers, to address climate-induced shortages of irrigation and drinking water by improving the resilience of land management practices and climate-proofing the underlying ecosystems in the Knuckles / Amban Ganga highlands and lowlands. Climate-smart project investments in

agriculture and water sectors will ensure the resilience of agriculture and value-added livelihoods in the area while protecting and complementing the public investments of the Moragahakanda multipurpose irrigation scheme and other development programmes. The risks related to increased temperatures, changes in rainfall frequency and intensity and the impacts of extreme events that cause extended droughts, frequent floods, severe landslides and silting of reservoirs and tanks, contributing to different aspects of water supply and demand which increase the vulnerabilities of farmers, plantation operations and the natural ecosystems are mitigated. Many outcomes of the GEF-SGP project could be upscaled in this larger project.