Food and Agriculture Organization of the United Nations

Ministry of Environment of Sri Lanka

Project News: Fertile Soil

2021 March - Issue #1

© FAO/Ruvin De Silva

Sri Lanka has strong sustainable land management regulatory framework - *Experts*

Most aspects of the Sustainable Land Management (SLM) in Sri Lanka are covered under the existing policies and the regulatory framework. The present issues of land degradation are related to noncompliance to the policies, weaknesses in implementation of regulations and lack of awareness among the farming community and the public on the policies and regulations, a team of experts pointed out.

A thorough review of existing SLM or SLM related policies and regulations was carried out by a team of experts assigned by the Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization of the United Nations. The final report of the review was presented recently. One focal area of the RDALP is strengthening institutional, policy and regulatory frameworks for SLM in Sri Lanka. This policy review was done to support the government to address SLM related policy issues. The review was carried out under the guidelines of the Land Resource Division of the Ministry of Environment. RDALP is funded by the Global Environment Facility (GEF).

The team of experts was headed by Professor Nimal Gunawadana of the Faculty of Agriculture, University of Peradeniya. The other members were Kapila Munasinghe, former Additional Director of the Natural Resources Management Centre and Dr Sunil Thrikawala, senior lecturer of the Open University of Sri Lanka.

The report stated that as per the power vested on ministers in respective disciplinary areas, amendments have been done to SLM and SLM related laws and policies in Sri Lanka at regular intervals and whenever new issues arisen to address them. Therefore, SLM and SLM related policies are adequate and up to date, the report noted. However, the report has stressed that availability of comprehensive policies and regulations does not necessarily mean that land degradation issues can be controlled fully by these policy and regulatory mechanisms.

The report points out various implementation issues and policy gaps. The report has identified major SLM related issues in Sri Lanka and the reasons behind them and has presented policy recommendations for the issues. According to the report, noncompliance to prevailing land use and environmental protection related Acts, policies and regulations by individuals, institutions and businesses is the most serious issue. Lack of knowledge and awareness of existing policies and regulations among the public are the reasons behind the issues. The report proposes to strengthen the implementation aspects of existing policies and regulations. The report also suggests introducing adequate policies and regulatory measures to ensure the compatibility of other laws and policies with land use planning policy.

Following major SLM related issues have been identified by the report;

- Rapid fragmentation of agricultural, plantation, uncultivated and neglected arable lands
- Over application of inorganic fertilizer and chemical inputs in agricultural lands
- Harmful and illegal actions and activities by industries and individuals are leading to water and soil pollution.
- Poor or inadequate soil conservation and unsustainable land use practices in small scale plantations
- Unlawful and unauthorized natural resource exploitation
- Acquirements and encroachments of government lands

Farmer training on soil conservation technologies

Soil erosion has been identified as one of the major issues in the farmlands in the central highlands of Sri Lanka. The Rehabilitation of Degraded Agricultural Land Project (RDALP) promotes soil conservation technologies among farmers in the project area in collaboration with government agencies.

A training program conducted on lock and spill drain systems and how to align the drains along contours – Nuwara Eliya ■

Soil test-based fertilizer application to reduce soil pollution

The Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization (FAO) of the United Nations has successfully implemented soil test-based, site-specific fertilizer usage in degraded farmlands in Welimada in the Badulla District.

RDALP's Field Coordinator (Badulla District) Upul Jayaweera said that soil testing was completed on around 90 percent of selected farmlands in micro watershed areas of Badulla District. He said that this was an important initiative in introducing scientific agriculture to traditional farmers.

The Site-Specific Fertilizer Recommendation Project (SSERP) jointly implemented by the FAO and the Department of Agriculture (DoA) ended successfully in 2018. Under SSERP, portable soil test kits were introduced to analyse soil nutrient levels of the farmlands. RDALP with government agencies replicate the practice in project areas where soil pollution is a major issue.

Through this new approach, officers of the DoA recommend the appropriate quantity of fertilizer for specific crops based on soil tests. The project is implemented in four micro watersheds in Badulla District - Sapugasulpotha in Bandarawela Divisional Secretariat Division (DSD), Dambugasagala in Welimada DSD, Sapugolla in Haliela DSD and Galenbindichchdova in Uvaparanagama DSD.

All farmlands in the micro watersheds are tested and beneficiary farmers receive soil recommendations or instructions to improve soil quality from field officers. The pH value of the soil, phosphorous and potassium concentration are tested. All the farmlands, home gardens, paddy fields, vegetable cultivation lands and tea lands are included in the programme. Soil test kits have been provided by the RDALP for agriculture inspectors of the micro watershed areas.

The responsibility of soil testing has been entrusted to agriculture inspectors through the provincial director of agriculture. The RDALP also supports farmers to rehabilitate their polluted farmlands by changing the chemical composition of soil. The provincial director of agriculture presents a report to each farmer on soil composition of their land, recommended fertilizer mix and other instructions to upgrade soil quality.

Agriculture Inspector, Bogahakumbura Division Anusha Priyangani said "Welimada is one of the main vegetable farming areas of the country. The lands here are subjected to severe soil erosion. As the soil fertility is low, farmers use inorganic fertilizer excessively. As a result, phosphorous and potassium concentration is higher in these lands."

Soil testing with the use of a portable soil test kit at the Agrarian Service Centre in Bogahakumbura, Welimada.

According to studies, inorganic fertilizer usage in Welimada is two times higher than recommended. Government incentives, such as the fertilizer subsidy provided to increase food security, have encouraged farmers to use more inorganic fertilizer. The government is now introducing various programmes to reduce inorganic fertilizer usage. RDALP encourages farmers to adopt Sustainable Land Management and Good Agricultural Practices to prevent soil erosion, improve soil quality, reduce chemical fertilizer usage and soil pollution. RDALP will provide 100 soil test kits to the DoA to further expand soil test-based fertilizer application.

World Soil Day 2020

Soil biodiversity is key to ensure food security, said FAO Representative for Sri Lanka and the Maldives Dr Xuebing Sun, issuing a statement on 5 December 2020, to mark 'World Soil Day.'

"Soil is an ecological system and it is a finite resource, meaning its loss and degradation is not recoverable within a human lifespan. Conservation of soil biodiversity and soil organic carbon through sustainable farming practices is essential to improve soil health and agricultural productivity," said Dr Sun in his statement.

Dr Sun reiterated that fighting loss of soil biodiversity is key to ensure global food security and to achieve over half of the Sustainable Development Goals. Soil biodiversity plays a vital role in the soil ecosystem as soil organisms are responsible for nutrient cycling, regulating the dynamics of soil organic matters, soil carbon sequestration and greenhouse gas emissions and allowing soils to function properly.

Soil biodiversity plays a central role in preserving human health through a range of pathways including water purification, climate stabilization, nutrient and food security. Plants surrounded by bio diverse soils also have a greater resilience against pests and diseases, he said.

"The strong collaboration between stakeholders in the agriculture sector towards conserving natural resources sends a clear signal. In the past 50 years, advances in agricultural technology led to a quantum leap in food production and bolstered food security. However, this intensive crop production has depleted the soil, jeopardizing our ability to maintain production in the future. To feed a growing population, it is important now, more than ever, to ensure that farming is done in an environmentally friendly manner, where not just livelihoods but our natural resources are placed at the centre," he emphasized.

Soil biodiversity, key to ensure food security – *Radio program and live webinar*

The Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization of the United Nations marked the World Sol Day on 5 December 2020. RDALP conducted two awareness programs to mark the World Soil Day; a live radio program and a live Webinar.

The radio program was broadcasted by Kandurata Service of the Sri Lanka Broadcasting Corporation under the theme "Soil Biodiversity, key to ensure food security". The target audience of the radio program was farmers engaged with the RDALP and the public.

The one-hour radio program focused on the importance of soil biodiversity, threats to the existence of soil organisms by human activities and primarily unsustainable agricultural practices. The resource persons of the radio program and the webinar were; Professor Chandi Rajapaksa and Dr Warshi Sharmila Dandeniya of the Soil Science Department, Faculty of Agriculture of the University of Peradeniya, D.N.Sirisena, Chief Agronomist of the Bathalegoda Rice Research and Development Institute, Nimal Gunasen, National Project Manager of the RDALP and Shanaka Gunawardena, National Project Manager of the National Biosafety Project.

The live webinar focused on the same theme with emphasis on scientific and technical aspects. The target audience was the officers engaged with the RDALP, university students and other interested parties who registered in advance and joined the program online.

The keynote speakers of the webinar were Additional Secretary of the Ministry of Environment Ajith De Silva and Assistant Country Representative (Programme) of the FAO in Sri Lanka Dr D.B.T. Wijerathne. In addition, RDALP published feature articles in national newspapers on soil day theme, situation in Sri Lanka and remedies to stop soil degradation and improve soil biodiversity.

Rehabilitation of Degraded Agricultural Land Project (RDALP)

The GCP/SRL/063/GEF project or RDALP of the Food and Agriculture Organization of the United Nations (FAO) is built on the existing institutional and regulatory framework of Sri Lanka. It is implemented on a series of field programmes and activities currently underway.

Under this project FAO in partnership with the Government of Sri Lanka rehabilitates degraded agricultural lands in the central highlands of the country. According to studies 50 percent of agricultural lands in the central highlands are in degraded condition.

The total project cost is USD 11 234 657. The Global Environment Facility (GEF) provides USD 1 344 657 with USD 9 740 000 co-financing from the Government of Sri Lanka and USD 120 000 from FAO.

The project covers an area of approximately 579 384 hectares of lands in three districts Kandy, Badulla and Nuwara Eliya which have the highest levels of land degradation. The project was started in 2016 and to be completed in 2021.

RDALP interventions in rehabilitation of degraded agricultural lands and implementation of Sustainable Land Management (SLM) in the central highlands are also relevant to the National Action Program (NAP) for combating land degradation in Sri Lanka 2015-2024. RDALP interventions are directly related to 22 out of 25 programmes listed in the NAP declared in 2014 by the Ministry of Magaweli Development and Environment.

Sri Lanka signed and ratified the United Nations Convention to Combat Desertification (UNCCD) and became a party to the convention in 1995. The Ministry of Environment is the National Focal Point (NFP) for the UNCCD in Sri Lanka.

The project is focused on:

- Strengthen institutional, policy and regulatory frameworks for SLM
- Implement identified SLM and land restoration technologies
- Develop and implement innovative funding systems to promote SLM
- Encourage knowledge management, awareness raising, and dissemination of best practices

Environment objective of the project

To reverse and arrest land degradation in agricultural lands in Kandy, Badulla and Nuwara Eliya districts in the central highlands of Sri Lanka

Development Objective of the project

To increase the provision of ecosystem goods and services and enhance food security in the Central Highlands of Sri Lanka through the promotion of Sustainable Land Management (SLM)

A vegetable farmer engage with RDALP agricultural land restoration program in Nuwara Eliya.

RDALP mobilise vegetable farmers in the central highlands to implement SLM practices in their farmlands. Vegetable cultivation lands in the central highlands are severely exposed to soil erosion and soil and water pollution making vegetable farming less profitable due to high cost and low yield ■

Sustainable land management boosts ecosystem benefits of farmlands

The economic value including ecosystem benefits generated by an acre of cropland in the central highlands is estimated over Rs.79000/year. It could be increased significantly by adopting Sustainable Land Management (SLM) best practices, a recent study conducted by the Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization of the United Nations revealed.

The study shows that the economic value, including ecosystem benefits of an acre of well-managed home garden that uses SLM best practices could be over Rs.225,500/ year. The study was conducted by the International Union for Conservation of Nature (IUCN) - Sri Lanka on behalf of the RDALP under the supervision of the Land Resource Division of the Ministry of Environment.

The study was carried out in farmlands of three districts in the central highlands; Kandy, Badulla and Nuwara Eliya where the project is implemented and thereby attempted to estimate the economic value including ecosystem benefits of agricultural lands and in micro watershed areas.

The project attempts to introduce new financing mechanisms for SLM, based on the new ecosystem valuation approach. Ecosystem valuation aims at providing monitory, biophysical or other values to an ecosystem, considering ecosystem services provided by them. Accordingly, the monitory value has been attached to the ecosystem of a farmland and the micro watershed area where the farmland is located and points out how the value increases in well managed farmlands that adopt SLM best practices.

A task of RDALP is to attract new investments for SLM in Sri Lanka introducing innovative financial mechanisms. The central highlands of Sri Lanka have faced higher level of land degradation and lack of funding has been identified as a major barrier to promote SLM best practices among farmers. RDALP attempts to calculate the financial value of the ecosystem services provided by farmlands and educate farmers on such services while stressing the importance of adhering to SLM best practices. Further, the assessments of farmer- perceptions of ecosystem services and disservices of agricultural lands and educating them on benefits they receive individually and as a society will help to develop innovative financing mechanisms for SLM.

The report highlights previous studies which focused on the adverse impact of poorly managed agricultural lands on the environment. Some studies had estimated the costs to the farmer due to lands being poorly managed. A study by Samarakoon and Abeygunawardena (1995) on soil erosion has estimated the impact of soil erosion on potato

Soil conservation technologies used in a sustainably managed home garden under the RDALP in Doluwa, Kandy.
The study reveals the economic value, including ecosystem benefits of an acre of well-managed home garden that uses SLM best practices is over Rs.225 000 a year.

cultivation in the Nuwara Eliya district. The study revealed that 9-15 tons/ hectare of soils were lost depending on the cropping season. Based on this, the nitrogen, phosphorous, potassium and organic matter lost was calculated. The study estimated the replacement cost ranges from Rs.2 305-Rs.3 443 per hectare. This is an environment cost-based approach.

However, this RDALP-IUCN study is an environmental benefit-based approach. The study has estimated the annual Total Economic Value (TEV) created by a general agricultural land to be around Rs.79 000/ acre. This includes around Rs.25 000 worth of water quality and purification, around Rs.6 000 worth of air quality, Rs.10 000 worth of climate regulation and about Rs.17 000 worth of soil fertility benefits per year. The TEV on an acre home garden was estimated as Rs.225 000 with ecological benefits; around Rs.4 000 worth of pollination and around Rs.177 000 worth of carbon sequestration benefits per year.

Some of the vital ecosystem services that are considered in the study include, sequestering carbon, pollination and seed dispersal, aesthetic value, soil retention, water purification, water flow regulation, supply of timber and fuel wood.

According to the study the main reason for not adopting sustainable land management practices in the project area is lack of awareness among farmers. "Agricultural lands do disservices by polluting water due to current practices. Eco certification could potentially address this issue. Lack of awareness in farmers is the main obstacle to adopt SLM practices. However, paddy lands have a higher educational value as they use relevant SLM practices. Further understanding of transfer of knowledge in paddy cultivation could help in the adoption of SLM in other lands", the report points out.

Tea and paddy lands have a higher aesthetic value while home gardens have more biodiversity which may have the potential for agro-tourism based financing mechanism. The comparative study of well-managed and the poorly managed lands highlights the ecosystem services that can be generated with good agricultural practices. A generalized valuation highlights that these ecosystem services have significant value for the society, farmers and landowners. Therefore, encouraging farmers to adopt sustainable land management practices on their farmlands can generate private and public values, the study shows.

Land degradation assessment in central highlands

Representatives of stakeholder agencies participated in the inaugural meeting on land degradation assessment

The Rehabilitation of Degraded Agricultural Land Project (RDALP) with the Department of Agriculture (DoA) launched Land Degradation Assessment (LDA) in the Kandy, Badulla and Nuwara Eliya districts of the central highlands. The objectives of this assessment are; increase and improve the provision of goods and services in agriculture, forestry and fisheries sectors in a sustainable manner.

Under this assessment the Natural Resource Management Centre of the DoA will gather vital land degradation information from the three districts. The outputs expected from the assessment are; Land use system maps for the three districts at suitable scale and resolution, Questionnaire Manual (QM) database following Land Degradation Assessment in Dry land (LADA) methodologies, identify land degradation hotspots and bright spots and mapping them, completion of local level assessment of land degradation hotspots and provide compatible data sets to update the national land information sharing platform, SriCAT.

Kallora's story:

Crop-dairy integrated approach in sustainable land management

K.M. Shantha Kallora (43) and his wife Anula Kumari (37) in Gurukele, Kandy in the central highlands of Sri Lanka are courageous farmers. They have successfully cultivated around two acres of land with tea and vegetables. They also engage in dairy farming.

Farming was not a lucrative venture for Kallora in the past. Therefore, he did not give prominence to it.

Kallora worked as a casual labourer in the construction industry to make a living. However, he now feels that farming is a profitable and sustainable occupation that provides a regular income compared to the daily wage he received as a casual labourer.

His land is on a slope and faces regular soil erosion. Tea is his main crop with pepper as an intercrop and shade management in the tea

plantation. He also cultivates vegetables and fruits in his home-garden.

He and his fellow farmers in Gurukele are affected by long periods of drought, fluctuation in rainfall and changes in the monsoon rain pattern due to adverse impacts of climate change. These factors affect crop yield and income, to make farming unattractive.

The productivity of their degraded lands had declined. As a remedy inorganic fertilizer was used excessively without soil testing. They were also unaware of the real composition of the soil. The remedy did not increase the yield or productivity but added to the cost of production. It also led to soil and water pollution.

Kallora was not aware that the cause for low yield and low income was his degraded land. He was enrolled to the Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organisation of the United Nations in 2018. Since then, he has been a beneficiary of the project.

Training and awareness programmes for soil degradation and applying Sustainable Land Management (SLM) practices were conducted by the Department of Animal Production and Health (DAPH), Department of Agriculture (DOA) and the Tea Smallholding Development Authority (TSHDA) and other stakeholder agencies of the RDALP to reverse the trend. Kallora has been an active partner of the project.

"We were educated on the degraded state of soil in our lands and trained to improve soil quality by implementing SLM and good agricultural practices by RDALP and government officials. We were funded through the project to implement soil conservation technologies in our lands. Most of the farmers used the opportunity to develop their lands using soil conservation methods based on scientific farm plans prepared by technical officers," he said.

Gurukele is located in the catchment area of the Nilambe Reservoir, a main source that supplies drinking water to Kandy town. Therefore, soil degradation in this area directly affects the water quality of the reservoir.

Kallora did not adhere to the best practices in his dairy farming which resulted in low yields. He had three animals but did not have a proper shelter for them. Farm waste was dumped in open areas without considering its environmental impact. As a result, the Nilambe Reservoir was polluted by the waste water that flowed in through its tributaries.

The RDALP helped Kallora to modernize his dairy farm by building a proper cowshed, introducing a farm waste disposal system and an integrated approach to develop his farming activities - tea and vegetable cultivation and dairy farming.

"As a result of this development in dairy farming, my income increased significantly. I combined tea and vegetable cultivation with the dairy farm by using cow dung as organic fertilizer. Earlier I used compost for vegetable cultivation but did not use it for tea. With the use of organic fertilizer, income from vegetables and tea has increased. The most significant achievement is the increase in milk production. Now my dairy farm is properly organized, thanks to the best practices introduced by RDALP," he said.

"My cows now have a proper shelter, food and water. As a result, they are healthy. Daily milk production has increased by around 10 litres," he added.

Kallora's land is now a model farm for training in sustainable dairy farming and crop-dairy integration.

Partner agency	Role
Department of Animal Production and Health (DAPH)	Provides technical knowledge in dairy farming
Department of Agriculture (DOA)	Provides technical knowledge in crop production, soil conservation and compost production
Department of Export Agriculture (DEA)	Provides technical knowledge in spice cultivation and production
Tea Smallholding Development Authority (TSHDA)	Provides technical knowledge in tea cultivation
Fonterra: A leading dairy product company that collects milk from the dairy farmers in the project area.	Field coordination and purchasing of milk

Pambadeniya farmers benefit from Sustainable Land Management

Pambadeniya is a village in the Doluwa Divisional Secretariat Division, Kandy District. It is a model village that implements Sustainable Land Management (SLM) practices. There are many farmers in Pambadeniya who now reap the benefits of applying SLM in their lands.

The Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization of the United Nations in 2018 introduced SLM programmes for the severely degraded tea small holdings and home-gardens in Pambadeniya.

H.G.Nimal is a beneficiary of the project. He joined the RDALP as a beneficiary in 2018 and became an active partner of the project. He has an acre of land cultivated with tea for over 20 years. It is his main source of income. However, he was not getting a proper income from his degraded tea plantation.

H.G.Nimal in Pambadeniya is one beneficiary of the project who have increased his income by applying SLM in his tea cultivation

RDALP and the Tea Small Holdings Development Authority (THSDA) supported Nimal to improve his tea plantation and rehabilitate the degraded land. Now he has increased his income by applying SLM in his tea cultivation.

RDALP's approach with SLM in the tea sector is in increasing the total productivity of the tea plantations. With this approach, the project provides technical and material or financial support to the farmers to increase their incomes from the land. The package includes - applying soil conservation technologies, shade management, infilling and fruit cultivation as an intercrop. The project provided the total package of assistance to Nimal to improve his land.

"RDALP provided a cash grant to implement soil conservation technologies. THSDA provided training and pointed out the degraded condition of my tea land, reasons for the low yield and income and solutions for the issues. Tea plants for infilling and plants such as arecanut, pepper and fruits for intercropping were provided. We were educated on the benefits of organic fertilizer to improve the soil quality. We were trained on producing organic fertilizer. We implemented recommended SLM practices and as a result today I receive a higher income from my land," he said.

The Pambadeniya area is exposed to a long drought every year. Nimal says that as a result of SLM, use of organic fertilizer, mulch and improved shade management, now his tea land is resilient to drought compared to previous years. Nimal and other farmers engaged with RDALP, continuously maintain soil conservation methods they have started.

These RDALP beneficiaries have shifted to producing fully organic tea and supply green tea leaves to a private company. Nimal said that they receive Rs.110/kg, a good price for organic green tea leaves.

Sustainably managed home-gardens

A sustainably managed home-garden in Bandarawella

Home-gardening in Sri Lanka is one of the major food production systems functioning with the objective of achieving self-sufficiency in food. It is a sustainable food production system and is considered as the oldest and main land use activity. According to studies in 1995 home-gardens accounted for 13.1 percent of the total land area of the country. (Tropical Agriculturist, Vol. 160, 2012)

Home-gardens still play a pivotal role of food production. With government incentives and promotional programs, the concept is on a growth trajectory. With the Covid-19 pandemic, fears of food insecurity and movement restrictions, home-gardening is becoming popular in rural and semi urban sectors.

Rehabilitation of Degraded Agricultural Land Project (RDALP) introduced Sustainable Land Management (SLM) in home-gardens. The Department of Agrarian Service joined to implement the program. RDALP considered the extent of land cover, its contribution to food security, income generation as well as poor attention to land management in home-gardens in this program.

Following the implementation of the program land productivity in home-gardens has increased and land degradation has reduced. Under the program RDALP introduced soil conservation technologies, high value crops such as Vanilla and compost production. The project also encourages the farmers to expand their home-gardens to economic home-gardens to earn an extra income.

Empowering women for sustainable land management

Women participants engaged in agro-eco-system evaluation activity at a Farmer Field School (FFS) organized for potatoes cultivation.

The Rehabilitation of Degraded Agricultural Land Project empowers rural women to increase their income from all forms of farming ventures. Women play an important role in agriculture and therefore, most of the participants in the RDALP organized training and awareness programs and FFS are women.

Shift from annual crops to perennial crops cultivation

New approach to prevent land degradation in Central Highlands

The Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization of the United Nations with relevant government agencies introduced the conversion of annual crops cultivated lands in unsuitable steep slope terrains in Welimada in the Badulla district to perennial crops. The objective of the approach is stop severe soil erosion and other forms of lad degradation. The approach is one of the land degradation neutrality targets of Sri Lanka in the national action programme 2015-2024 of the United Nations Conventions for Combating Desertification (UNCCD).

Soil erosion is a major issue in this area of the Central Highlands which makes farming less profitable and attractive. Uvaparanagama Divisional Secretariate (DS) Division in Welimada has been identified as the area with the highest soil erosion in Sri Lanka by studies. Several causes have been identified for soil erosion including the geography, with steep mountain slopes, unsustainable farming practices, lack of awareness of the farmers on soil erosion and conservation technologies and cultivation of unsuitable crops for the terrain.

The farmers of the area encroach government lands in the steep mountain slopes and cultivate potatoes during the North Eastern monsoon period from October to January. This farming practice is called chena cultivation (slash and burn) and it is a temporary rainfed cultivation method that lasts around three to four months with the end of the monsoon season. Farmers tend to cultivate seed potatoes which fetch higher price but unsuitable for the terrain. After harvesting the crop, farmers abandoned the lands and during the rest of the year the lands become pasture for cattle and are exposed to bushfires in July and August, another cause for land degradation.

Due to this farming practice the farmers do not pay attention to soil conservation or long-term sustainability of the land. On the other hand, during the monsoon rains, they loosen soil three times; at land preparation, earthing up and harvesting which leads to severe erosion of lands.

Since the land has been used for a long period under this unsustainable cultivation method, now it is severely degraded and is unfertile. Hence farmers have to use excessive chemical fertilizer and pesticides. This again leads to another form of

A land successfully converted to tea cultivation

land degradation, soil and water pollution.

The vicious cycle continues every year making these farmlands less and less productive and

causes major environmental, social and economic issues. Around 30 percent of the lands in the area are subjected to this unsustainable farming practices.

The rationales behind this conversion approach are;

- Shifting to perennial crops will stop frequent land preparations for annual crops
- Introduce tea cultivation with proper conservation methods
- Reduce agrochemical usage
- Prevent damages by stray cattle and bushfire in the fallow period
- Ensure higher income to farmers throughout the year

Implementation

RDALP launched this initiative with ten farmers in Welimada and Uvaparanagama DS Divisions.

This approach faced several challenges. The high cost of conversion is the main obstacle. The cost of land preparation, planting and maintenance of new tea plantation is relatively costly to potatoes or vegetable cultivation.

Also, it takes three to four years to generate income from a new tea land if farmers follow the land preparation process recommended by the Tea Smallholdings Development Authority (TSHDA). Considering the gravity of the soil erosion issue in the area RDALP with the stakeholders decided to be flexible and change the procedures to make the conversion less burden to farmers. Accordingly, tea was cultivated in the beads prepared for potato cultivation.

Farmers were instructed to skipped the six-months grass planting process in the land preparation and introduced organic fertilizer application instead. Orange and pomegranates were introduced as intercropping. The Tephrosia plant was introduced as a land cover to reduce erosion and now farmers use them as a wind barrier as well.

Chandrasena Rathnayake of Mahahena, Uvaparanagama is a successful farmer now reaping benefits of the crop conversion approach. He said that now he gets a regular income from tea and it is profitable than potatoes cultivation.

“We have started tea plucking within two years but the income is low yet but definitely it will pick up in the years to follow as plants mature. Fruit plants are still small and I have cultivated orange and pomegranate and they will give an extra income in time to come. The issue in this transformation is high cost. I spent over Rs. 200 000.00 for this half an acre land and THSDA provided a cash grant, tea seedlings and technical advice. RDALP provided fruit plants”, he said ■

Farmer training to prevent land degradation

Awareness and Training programs were conducted to educate farmers on unsustainable farming practice and the importance of conversion to perennial crops. A field training conducted in Welimada

Good Agricultural Practices Certification

A market-based approach to sustainable land management

The Rehabilitation of Degraded Agricultural Lands Project (RDALP) of the Food and Agriculture Organization of the United Nations supported to expand the agriculture modernization project jointly conducted by the Department of Agriculture (DoA) and Cargills (Ceylon) PLC in the central highlands.

This is an initiative of Cargills PLC, first launched in the Anuradhapura and Monaragala districts for vegetable farmers. Since the agro products of the project meet Good Agricultural Practice (GAP) certification criteria, later the DoA joined the project and provided technical support to produce GAP certified products.

Since this project addresses most of the Sustainable Land Management (SLM) aspects, the RDALP decided to collaborate with the project and expand it in the project area. RDALP launched SLM best practices and environment-friendly agricultural practices. The DoA supports the farmers to get GAP certificates to their farm products. The Cargills provides modern agriculture technologies to farmers and purchases the GAP certified farm products at higher price and sells at its supermarkets.

RDALP has two objectives in supporting the project; encourage public private partnership in SLM and encourage private sector investment in SLM. RDALP is working to introduce innovative financing mechanism for SLM and it is a main task of the project.

"If we look at the gravity of land degradation in the central highlands, the government alone cannot finance to stop land degradation and promote SLM. On the other hand, land is not a public good and the degradation is a result of using it for economic activities that gain profits. The issue is created due to unsustainable use of land. To reverse the process and stop degradation of land we have to shift the land users to sustainable use of it. For that there has to be investments made in SLM. However, we cannot expect farmers to invest money just for the sake of soil conservation or other SLM practices. In all through our initiatives we attempted to launch market-based approaches and the GAP program is the best success story,"

A GAP certified vegetable farm in Welimada, Badulla

National Project Manager of the RDALP Nimal Gunasena said.

The GAP certification ensures that these farm products meet quality standards and are environmentally friendly, socially acceptable and economically profitable. Agriculture extension officers of the DoA work closely with farmers and ensure that GAP principles are applied at every stage of production.

Initially, 100 famers have been selected and DoA extension officers trained them on SLM bestpractices and GAP principles. Farmers are trained on soil conservation technologies, fertilizer application based on soil testing, conservation of water sources and catchment areas through the program and RDALP provides financial or material aid to farmers to implement them.

"It has been proved that SLM cannot be sustainably implemented simply by mobilization of farmers or strict regulations. RDALP has proved that application of SLM best practices could increase land productivity, harvest and farmer income. Farmers can also fetch a higher price for environmentally-friendly products. Since this is a market-based approach that farmers get a higher income by practicing SLM this is sustainable" Nimal Gunasena said.

The objective of the GAP program is producing high quality agricultural products that can fetch higher prices in the market and increase farmer income. There are new trends in the demand for agricultural products in the domestic and global markets. Consumers are highly concern about non-communicable diseases such as diabetics, cancer and heart attacks and seeking safe farm products. As a result, there is a high demand and good price for organic farm products.

"Ethical products" is another brand name that refers to the products that do not damage public goods in the production process and promote the public goods. Therefore, farm products that are produced using excessive chemical fertilizer and polluting soil and water cannot be considered asethical products.

Accordingly, this program introduces new dimensions to ethical agricultural products that use SLM and environmental best practices and they come to the market with GAP certification. The total investment for the GAP program is Rs.42.6 million of which Cargills provides Rs.13.6 million, RDALP contributes Rs.10.8 million and farmers contribute Rs.18.2 million ■

Sustainable land management in tea smallholdings

A training program organised for tea smallholders in Hanguranketha in NuwaraEliya.

Poorly managed tea smallholdings have been identified as a major sector that contribute to land degradation in the central highlands. RDALP with the Tea Small Holdings Development Authority (TSHDA) launched programs to promote SLM among tea smallholders.

Farmers were educated on conservation methods, technologies and were provided materials, seedlings and funds to conserve tea lands through the program. The approach was based on increasing total productivity in tea lands by soil conservation, infilling, intercropping of fruit plants, organic fertilizer application, etc.

Farmer field schools :

To promote sustainable land management in potato cultivation

In early 2020, the Rehabilitation of Degraded Agricultural Land Project (RDALP) of the Food and Agriculture Organization of the United Nations together with the Departments of Provincial Agriculture Uva and Central provinces conducted Farmer Field Schools (FFS) to disseminate Sustainable Land Management (SLM) best practices among potato farmers in the Badulla and Nuwara Eliya districts.

Potato cultivation in the central highlands leads to severe soil degradation in two ways. In potato cultivation farmers loosen soil in the land on three occasions; at land preparation, earthing up and harvesting which leads to soil erosion.

Also, potato is a crop on which chemical fertilizer and agrochemicals are used extensively which lead to soil and water pollution. At the farmer field schools, farmers were persuaded to change their unsustainable farming practices and adopt SLM best practices.

RDALP field coordinator of Badulla and Nuwara Eliya districts Upul Jayaweera said that FFSs have given impressive results. K.M.Gunapala, a farmer in Wepassawala, Badulla, who participated in the FFS and followed what he learnt said that his yield increased from 1:5-6 on average to 1:14 following the application of SLM practices.

Gunapala said that with the practical knowledge gained at the FFS he reduced the usage of chemical fertilizer from 200 kg to 85 kg or 57.5 percent. Department of Provincial Agriculture carried out tests on soil in farmlands and recommended fertilizer and less application of it.

RDALP conducted seven FFSs in Badulla and Nuwara Eliya districts for seed potato cultivation. Hundred and fifty farmers participated and a 0.25-acre plot of land from each farmer was used as a model farm plot to apply SLM. Accordingly, under this program 37.5 acres of land were cultivated.

Bumper harvest from model farm cultivated under FFS in Welimada in Badulla

FFS is a group-based learning process introduced by the FAO. The first FFSs were designed and managed by FAO in Indonesia in 1989. FFS have been used in pest control in paddy cultivation in Sri Lanka in the 1980s.

However, this approach was abandoned later and RDALP attempted to rejuvenate the model in SLM promotion and has shown impressive results. Farmer field school changed the traditional top-down extension approach and enable farmers to analyse issues and given experiment-based training. Extension officers become facilitators and therefore FFS is fully a practical training program.

gef Funded by Global Environment Facility

GCP/SRL/063/GEF

Rehabilitation of Degraded Agricultural Land Project Office,
Food and Agriculture Organization of the United Nations
Perradeniya, Sri Lanka