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## 1.3: Project Idea for Technology 2: Sustainable Land Management (SLM)

### *Restoration and Preservation of Highland Productivity Using Sustainable Land Management Practices to Increase Climate Change Adaptability*

#### 1.3.1 Introduction/Background

Land degradation problems of varying intensity are experienced in all 48 agro-ecological zones in Sri Lanka due to a variety of contributing factors. The pressure factors that cause land degradation are high population density (330 persons per km<sup>2</sup>), low per capita land availability (0.13 ha arable land per head) and 33% of the labour force engaged in agriculture<sup>4</sup>. About 17% of the land area is comprised of hilly and mountainous terrain having steep slopes and narrow valleys that makes it highly susceptible to land degradation due to high rates of soil loss (over 100 tons/ha/yr in intensively cultivated land)<sup>5</sup>. Being a food deficit country there is a great deal of effort to increase domestic food production and the high dependence of rural populations on agriculture has driven to exploit agricultural land use as means of poverty alleviation.

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<sup>4</sup> CBSL, 2011 & DC&S, 2002

<sup>5</sup> Upper watershed Management Project, Final Report, 1997

Land consists of not only the soil but also the associated natural resources such as water, vegetation, landscape, and microclimate that are components of a larger ecosystem. As the land is interconnected with other natural resources such as the air, water, fauna and flora, managing land well, in addition to guaranteeing food supplies, poverty reduction and socio-economic development it helps to protect environment and natural resources and facilitate to continue to accomplish ecological functions and services in a sustainable manner.

Land degradation is recognized as one of the most serious environmental problems in the country and occurs in all forty eight agro-ecological regions at different intensities. Degradation of land is a major cause of declining productivity and thereby lowering farmer incomes. Based on the information available from various sources, the degraded land are can be estimated to be over 240,000 ha of lowland cultivated to rice, about 100,000 ha of highland cultivated to other food crops and about 75,000 ha of plantation crop lands. It has been recognized that climate change will worsen the incidence of land degradation further threatening the stability of food supplies and viability of farming.

Sustainable land management (SLM) is identified as a climate change (CC) adaptation technology in the food sector because of the importance of sustaining healthy soil, habitat conservation and restoring degraded land in the country. Productivity of land is a key determinant in ensuring food security, alleviating rural poverty and hunger. Land degradation has already taken place to various degrees and the objective of sustainable land management should necessarily consider restoring such degraded lands while preventing further degradation of any non-degraded land to ensure continued ecosystem health and functions. SLM is not limited to engagement of appropriate technology in crop or animal husbandry, given that a host social and economic parameters influence the actual practice of good management. Therefore, prescribed SLM practices involve many institutional, knowledge building, coordination, legal, research and enforcement mechanisms.

### **1.3.2 Objectives**

- Sustainable Land management Project will primarily aim to restore the fertility and productivity levels of agricultural land already deteriorated due to poor management and other natural and anthropocentric parameters. The specific target of the project is the restoration of the fertility status of 25,000 ha of highlands cultivated to other food crops and 15,000 ha of plantation crop lands from the stock of 175,000 ha from the two land categories of which the fertility status is deemed to have declined.
- The secondary objective would be to prevent degradation of land with good fertility status. It also involves maintaining the present fertility status of an unspecified area of non-degraded land allocated to food production by promoting good land management practices as the common standard and setting up the institutional structure necessary to ensure it.

### 1.3.3 Outputs of the Proposed Project

The key outputs of the proposed project will comprise of the following:

- a) Training 25,000 farmers on SLM practices
- b) Adoption of on-farm soil conservation, sloping agricultural land technology (SALT) etc in 35,000 ha
- c) Issue grants, subsidies and other direct and indirect assistance to adopting selected SLM
- d) Establish 5,000 ha of forest plantations in heavily degraded hilly areas
- e) Promotion of crop-livestock integration and non- and off-farm enterprises for income generation
- f) Arrange for granting of titles or long leases to land to those in the project area
- g) Develop capabilities (GIS, databases etc) to provide information for planning and managing watersheds
- h) Monitor sedimentation of reservoirs in the project area
- i) Revise National land use Policy and Agricultural policy to include SLM
- j) Set up District and sub-district SLM Coordination Committees

#### **Relationship to the country's sustainable development priorities**

Land degradation is one of the most critical problems affecting the economic development of Sri Lanka. The high demand has increased pressures on land resources and has resulted in a high level of degradation. It had been estimated that nearly one third of the land in Sri Lanka is subjected to soil erosion, the erodible proportion ranging from less than 10% in some districts to over 50% in others. Severe erosion takes place in the hill country on sloping lands under cash crops like potatoes, tobacco, vegetables, poorly managed seedling tea and chena cultivation<sup>6</sup>.

Soil and water conservation and land productivity improvement are recognized as important policy priorities for Sri Lanka under various strategies for national and sectoral development. The National Agriculture Policy (2007) of the Ministry of Agriculture lists 3 areas relating to sustainable land management, i.e. Irrigation and water management, Land use and Soil conservation among the 22 Policy Statements and recommends specific actions relating to conservation and judicious use of land and water resources to translate policy in to implementation. Sri Lanka's Ten Year Development Policy Framework, the "Mahinda Chinthana – Vision for the Future", recognizes land productivity improvement as a key strategy for agricultural development and poverty alleviation. A "National Land Use Policy" was introduced by the Ministry of Lands and Land Development in 2007 that recommends stronger efforts to protect and improve land productivity.

The project contributes to the national goal to make progress on the national priority to improve productivity of agricultural land to improve food security for the nation and eliminate poverty, which remains a relatively difficult problem to solve in the rural areas where agriculture dominates.

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<sup>6</sup> The State of the Environment, 2010

#### 1.3.4. Project Deliverables

- a) **Improved land productivity:** Improved land productivity leading to greater crop yields and production, increased opportunities for employment for farmers and agricultural labourers in the area. It will lead to declined poverty among farmers and improved growth in the local economy.
- b) **Employment generation:** It is estimated that undertaking land improvements activities in farm such as removal of rocks and moving soil, cutting contour drains, leveling and grading, constructing stone terraces, planting live fences and cover crops, and the maintenance of conservation works will create substantial amount of employment for the farmer and family.  
The women will be particularly benefitted by the creation of work opportunities in the own farm and the immediate neighborhood.  
The plantation workers from the ethnic minority will benefit by finding additional employment opportunities created in the area. As many of them are engaged in home gardening and small scale cash crop production they will benefit both directly and indirectly.
- c) **Reduction of GHG emissions:** SLM mitigates GHG emission contribution and increased carbon sequestration through reduction of fertilizer use by Site specific fertilizer programs, better management of farm yard manure combined with integrated plant nutrient management practices increase use efficiency of fertilizer and thereby increasing organic carbon content in soil and soil fertility. Best management agriculture practices provide the opportunity for carbon trading, and this can be used for income generation.
- d) **Develop biogas for light and cooking in households:** Enteric fermentation (bio digesters) of animal wastes to reduce CH<sub>4</sub> emissions and develop biogas for light and cooking in households. Strong social benefits here, also, due to lessened smoke inhalation in households, and cleaner living conditions.
- (e) **Introduction of organic Agriculture:** Introduction of organic Agriculture for the fragile eco systems supplies safety food and encouraged green economy.

#### 1.3.6 Project Scope and Possible Implementation

There have been a number of land and soil conservation projects targeting various regions in the upcountry funded by various donors such as the USAID, GTZ, ADB, FAO/UNDP and the World Bank<sup>7</sup>. Yet, the seriousness of the issue and the area under consideration is so large previous efforts and investments have not been sufficient to fully address the problem. There is a wealth of information about the appropriateness of various practices and the viability of different conservation measures which will serve to improve the knowledge base in quickly getting the project off to a good start.

The proposed project place a great deal of emphasis on building up to the learning from the previous experiences and also on institutionalizing the learning by adopting a strong participatory approach to implementation at the ground level and supporting mechanisms to internalize land management within the respective state and community organizations. Through this approach it is envisaged that the interventions

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<sup>7</sup> Jayakody, et al. 2007, Gunawardena, 1998

introduced by the project will find greater ownership within the communities and institutions and continued beyond project period.

### 1.3.7 Project activities

The main activities of the project comprise of direct actions that assist in the implementation of the sustainable land management measures at the farm level and capacity building and coordination measures that support ownership creation and internalizing the project within the key responsible Ministries and Departments. The selected activities are listed below under associated key components of the project.

#### A) Increase Awareness and Priority for Sustainable Land Management

- 1) Raise awareness and knowledge on appropriate land management techniques
- 2) Develop land management methods for larger units
- 3) Introduce organic agricultural practices for the fragile eco systems
- 4) Promote land conservation as a national priority in agric and non-agric land uses

#### B) Improve Affordability of Adopting Sustainable Land Management

- 1) Introduce grants, subsidies, loans and other forms of assistance to practice SLM
- 2) Raise public and private investment on SLM research and development
- 3) Securing Land Ownership rights

Proposed Timelines for Implementation of Proposed Activities are given in the table 1.4 below.

- 4) Develop model SLM packages for diverse land, weather, soil, terrain, size and land formation classes
- 5) Introduce alternative livelihoods to reduce pressure on land

#### C) Build Institutional Capacity for Effective Enforcement of Land Management

- 1) Review and update National Policies (National Land Use & National Agriculture Policy) to accommodate climate change aspects
- 2) Support to enforcement of land management policies, laws and regulations
- 3) Set up land use planning and independent system monitoring enforcement
- 4) Improve coordination among stakeholder organizations

### 1.3.8 Timelines for Proposed Activities

The proposed timeline for implementation of proposed activities are provided in table 1.3.

**Table 1.3: Proposed Timeline for Implementation of Proposed Activities for Technology 2.**

Activities	Year									
	1	2	3	4	5	6	7	8	9	10
1.Raise awareness and knowledge on appropriate										



**Table 1.5: Approximate Budget Estimate for the Proposed Project 2**

<b>Main Activitiy</b>	<b>Sub Activities</b>	<b>Estimated Budget (US \$ million)</b>
1.Raise knowledge on SLM	Raise awareness and knowledge on appropriate land management techniques	3.00
	Develop land management methods for larger units	3.00
	Introduce organic agricultural practices for the fragile eco systems	2.50
	Promote land conservation as a national priority in agric and non-agric land uses	1.50
	<b>Total</b>	<b>10.00</b>
2.Increase affordability of SLM	Introduce grants, subsidies, loans and other forms of assistance to practice SLM	15.00
	Raise public and private investment on SLM research and development	10.00
	Securing Land Ownership rights	2.00
	Develop model SLM packages for diverse land, weather, soil, terrain, size and land formation classes	5.00
	Introduce alternative livelihoods to reduce pressure on land	8.00
	<b>Total</b>	<b>40.00</b>
3.Build capacity for SLM application	Review and update National Policies (National Land Use & National Agriculture Policy)—to accommodate climate change aspects	0.50
	Support to enforcement of land management policies, laws and regulations	4.50
	Set up land use planning and independent system monitoring enforcement	5.00
	Improve coordination among stakeholder organizations	1.00
	<b>Total</b>	<b>11.00</b>
1. Project Management		7.00
<b>Total Cost</b>		<b>68.00</b>

The project should target to develop co-financing opportunities locally through the commercial banks by making funds available for the implementation of the SLM interventions at the farm level. The sustainability of the project will depend on continued assistance through the availability of funds from the financial institutions for the farmers to introduce new measures or for the rehabilitation of aging structures. Co-financing models developed and implemented during the project will permit the financing institutions to develop capacity for internalizing assistance programs.

### **1.3.10 Measurement/Evaluation**

The project specific Logical Framework Matrix (LFM) and the Performance Measurement Framework (PMF) will be used to oversee progress of implementation, monitor and evaluate it during the course of the project life. The project LFM and PMF permit identifying problems and undertaking necessary on-course corrections to rectify any problems experienced during the implementation phase. The monitoring framework will have scheduled internal monitoring events (quarterly) as well as periodic external evaluations (annually or bi-annually) to support the implementation process. End of project result evaluation will be undertaken and incorporated to a Project Completion Report.

### **1.3.11 Possible Complications/Challenges**

There are potential difficulties to achieving project targets due to factors that are not well within the project's ability to influence. Two of the important issues relate to the fertilizer subsidy programme implemented by the government and the prices of agricultural commodities which may not provide predictability and guarantee remunerative prices to producers.

**Fertilizer subsidy** – The subsidy given to fertilizer has encouraged farmers to rely solely on inorganic fertilizers to obtain higher yields. This has also led to unbalanced use of nutrients with higher application of nitrogenous fertilizer. More disturbing is the fact that this has dissociated farmers from applying organic fertilizers such as FYM manure and compost which are important in improving the soil properties that reduce erosion and nutrient depletion. Thus, the fertilizer subsidy has operated in a manner detrimental to adoption of some of the important soil conservation measures. Continued provision of fertilizer at the current subsidized rate will make it harder to encourage application of organic fertilizer of which the importance in protecting and improving soil productivity as or more important than nutrient supply. Educating farmers to adopt balanced fertilizer and add organic material to retain long term productivity of soil has been a challenge.

**Low and unstable agricultural prices** – Returns to undertaking soil conservation measures depend on crop prices as reasonable return on investment is necessary to encourage continued adoption of conservation measures and sustainable practices. However, declining and variable prices of agricultural commodities is a challenge to make farmers think of the long term. Due to unsteady trade and marketing policies and poor

production coordination prices of many agricultural commodities that bring a higher income to farmers such as onion, potato, chilli, and even rice have been too volatile to give farmers a good income.

**Slow Progress in Policy Reform** – The project envisages significant reform in policies pertaining to land management and the participation of many agencies in developing and implementing policy. There can always be resistance to reforming policies from institutions who feel that their sphere of influence is diminished by new policy. Such agencies get in the way of reform and delay progress. The project must be aware of the prospect and adopt counter measures to bring all on board with a better understanding and agreement on the purpose.

### 1.3.12 Responsibilities and Coordination

The **implementing Ministry would be the Ministry of Agriculture**, directly overseeing the subject and will host the project. The project management arrangements will have coordination and decision making responsibilities involving all key stakeholders. The establishment of a **Project Steering Committee** under the chairmanship of Ministry of Agriculture with other key stakeholder organizations would oversee project implementation. A **Project Management Committee** involving staff closely involved with supervising implementation and monitoring can provide the necessary guidance and troubleshooting.

List of other Stakeholders:

- a) Ministry of Lands and Land Development
- b) Ministry of Plantation Industries
- c) Ministry of Disaster Management
- d) Ministry of Irrigation and Water Resource Management
- e) Department of Agriculture
- f) Sri Lanka institute of Nano-technologies

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