Terms of Reference

Consulting Services to Prepare a Agro-ecological Landscape Resilience Plan in the Hambanthota District HSA
Climate Smart Irrigated Agriculture Project (CSIAP)

1. BACKGROUND

The Climate Smart Irrigated Agriculture Project (CSIAP) funded by the World Bank aims to improve the productivity and climate resilience of small-holder agriculture in selected climate hot spot areas. Sri Lanka is one of the worst climate affected countries in the world, and being largely an agricultural country, climate change impacts have increased agricultural vulnerability threatening the productivity and well-being of farmers. The drivers of this vulnerability are predominantly manifested in restricted access to irrigation water, insufficient protection of farmlands from floods, limited adoption of climate smart technologies and low levels of diversification in agricultural production. The project aims to address these key causes of agricultural vulnerability in selected climatic hot spot areas. This will involve an approach that addresses response to long-term trends in climate change, adopting a catchment scale approach to water management, integrating agriculture and water management with farmers and Farmer Organizations (FOs) to improve water/soil management, adoption of suitable on-farm water management and crop production technologies.

Equally important for climate resilience is biodiversity, which plays a major role in balancing production system and in the larger landscape maintaining ecological integrity that contributes to natural cycles. Successful integration of biodiversity conservation into agricultural production systems is fundamental to maintaining functional ecosystems that provide critical ecosystem services such as. the provision of water and regulating water quality, maintenance of natural soil quality, nutrient recycling, pests and disease control, pollination, function of nutrient cycles and climate regulation. Sustainable management of natural resources will ensure ecosystem resilience and in turn safeguard agricultural productivity in the face of changing climate trends through the direct connections that exist between the natural resources, land and ecosystems, on which agriculture is practiced.

The ecological footprint of modern agriculture on Earth is substantial. With increasing human populations and changing consumption patterns, agriculture has been facing increasing challenges in meeting expanding production needs within growing environmental constraints. Modern day farming, unfortunately, has not been compatible with nature conservation and vice versa, where traditionally, farming and ecosystem conservation aims to segregate land as production areas and protected areas that are mutually exclusive from each other. In this approach, farmers and wildlife are a problem to each other and often ends in severe socio-economic conflict. Further declining environmental conditions such as biodiversity loss, deforestation, water shortages, desertification, soil erosion, climate change, and various other dynamic factors make it increasingly difficult to improve agricultural productivity unless there is a fundamental change in the way farming systems are looked at.

There is ample scientific evidence to showcase that farming systems are able to make important contributions to biodiversity conservation, with forms of land use that support the objectives of biodiversity conservation rather than conflict with them. The fact that natural biological diversity strengthens agroecosystem resilience in production landscapes is well established. It requires innovations within relevant agricultural planning and management strategies. The human elephant conflict (HEC), which is particularly significant in all the HSAs, is a good case in point where agricultural expansion, human settlements have come on a direct collision course with biodiversity conservation due to lack of integrated planning. In order to avoid further intensifying HEC, innovative landscape level strategies need to be established where wildlife and humans can co-exist in the same landscape.

As land becomes increasingly scarce and impacts of climate change becomes more evident, formulating effective management responses that seek to balance conflicting demands of land-use in the larger landscape and mainstreaming biodiversity and ecosystem services in non-conservation land becomes important. In production landscapes such as paddy lands and agricultural farms, the challenge is to find ways to promote the conservation of biological diversity and the sustainable use of ecosystem services by farmers. In other words, "mainstreaming agrobiodiversity/agroecology" where land-use systems can manage to produce food while protecting natural ecosystems and the services they provide. This is very important in managing climate induce vulnerabilities of production systems in the long-term.

Agroecological resilience can be approached at two levels – landscape level and farm level.

- At the farm level, the main goal is to integrate strategies to enhance and maintain agrobiodiversity, so that farming relies primarily on ecosystem services and move away from harmful artificial inputs. Greater agroecosystem diversity (both at landscape and farm levels) will buffer against climate change induced impacts (shifting rainfall and temperature patterns) and possibly reverse downward trends in yields over the long-term depending on how crops respond to the shock. There are many agroecological management practices that increase agroecosystem diversity and complexity as the foundation for soil quality, plant health, and crop productivity.

- At the landscape level, the main goal is to promote strategies that bring about greater harmony between conservation and production land use practices/activities through upstream planning. Farms are nested within larger landscapes and thus interact with other land uses. The overall performance of such farms depends on how effectively they take advantage of the suite of ecosystem services provided by surrounding natural ecosystems. Climate-smart agriculture follows a landscape approach, which builds on the principles of natural resource management systems that recognize the value of ecosystem services to multiple stakeholders. Coordination at the landscape level facilitates the integrated management of production systems and the natural resources that underpin ecosystem services needed for all sectors. Managing landscapes demands an understanding of how the needs of local communities can be addressed without eroding biodiversity and disrupting the functioning of ecosystems. To achieve successful outcomes, the people who have an impact on the landscape must come together to plan and negotiate acceptable practices and management actions.

This assignment is a pilot study in the Hambanthota District, to specifically look at the overall landscape defined in the Hot Spot Area (HSA) Agricultural Development Plans for Yodakandiya, Bandagiriya and Weerawila ASC area under CSIAP, to understand its ecological character, both in production and non-production habitats, current issues and challenges and seek opportunities to bring in greater environmental and social resilience through appropriate integration of sustainable agroecological practices within the HSA.

2. OBJECTIVES OF THE CONSULTING ASSIGNMENT:

The objective of consultancy service is to develop an Agro- ecological Landscape Resilience Plan (ALRP) as a climate smart intervention for the proposed Hambanthota District Agricultural Hot Spot Area as a macro-landscape. See Annexure (I) for the map of the Hambanthota District Hot Spot Area.

3. SCOPE OF WORK:

The Specific areas of coverage of the Consultancy service include the following,

(a) To assess the current land use pattern and status of the Hambanthota District HSA and assess current/future demands that is shaping use of land/natural resources within it.

(b) To review the ecological character of the Hambanthota District HSA, map existing forests patches, corridors and other important ecosystems within it including food production areas.

(c) To identify issues, threats and drivers of change that have and will continue to shape the ecological character and balance within the landscape. The focus here should be centred mainly around ecosystems within and adjacent to HSA landscape that support the food production ecosystems.

(d) To determine critical ecological networks within the HSA landscape and the economic value of key ecosystem services, especially focusing on benefits to food production ecosystems.

(e) To study the extent of the HEC over the last 10 years, with a particular emphasis on HEC levels (number and intensity) that exist in the landscape today and how it will increase and intensify with agricultural expansion and productivity improvement that are planned under the HSAAD plan. Mapping of the potential movement paths of elephants in particular (normally an elephant is assessed to move 2800sq Km a year). This is essential to suggest mitigation measures due to HEC.

(f) To understand the social impacts of the HEC on community living and livelihoods including impacts on vulnerable groups.

(g) To identify key stakeholder groups in the HSA landscape, assess their level of interest and influence its future land-use and identify means of engaging them for fostering greater harmony between conservation and production land use practices – to improve climate resilience of the HSA landscape. The involvement of local communities in a participatory approach will be very useful

(h) To identify appropriate landscape level management strategies that will promote integrated management of agricultural areas and the natural resources that underpin ecosystem services that are essential for food production and buffer against climate risks.

(i) To prepare an ALRP for the Hambanthota District, that will include;

- An area map showing the current land use with production/non-production zones, environment/conservation threats including locations of HEC, areas of opportunities for environmental restoration for enhancing the agroecological resilience of the landscape. This will also include proposals for levelling to enable farming with required sustainable measures.

KEY TASKS:

TASK 1: Ecological Characterization of the Hambanthota District HSA landscape

Key baseline information covering socio-economy, hydrology, agronomy, livelihood and community development etc[1] that describes the production economy of the Bandagiriya, Yodakandiya and Weerawila ASC area as a macro landscape is available through the respective HSAAD plan. These have been done through the review of available socio-economic data supplemented with targeted and well-structured PRAs, field assessments, ground surveys, stakeholder consultation etc through project planning teams and consultancies.

One of the key information gaps is the ecological character of the production landscape. This assignment will seek to close this gap by including the following to provide a description for the Hot Spot Area landscape.

1.1 Land-use and socio-economic features:
- Land-use pattern across the HSA with clear demarcation of aquatic habitats, production and non-production lands.
- Population and settlement patterns.
- Livelihood distribution patterns and where possible poverty statistics mapped on the HSA landscape.
- Agro-production patterns across the HSA and its dependency as a livelihood

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[1] As part of the contract all raw data should be submitted along with coordinates of all survey and transect locations.

- Forest dependency of buffer zone communities of key ecosystems and trends of natural resource utilization
- Archaeological and cultural sites distributed across the HAS landscape, if any.

1.2 Ecological features:
- Key eco-systems within the Hambanthota District HSA, their conservation status and bio-diversity.
- Spatial distribution of these key ecosystems (on a map).
- Boundaries of any forest patches, wetlands and other significant natural ecosystems within and in close proximity to the ASC areas of Bandagiriya, Yodakandiya and Weerawila Hot Spot Area.
  - *Note: The distance (0 - 5 km as requirement) from the HSA boundary, that would be covered in mapping ecosystems will need to be agreed with the PMU.*
- Location and type of each forest/significant natural ecosystem according to standard classification.
- Locations of other Protected Areas and internationally designated areas (e.g., Cultural and Archaeological, World Heritage and International Biosphere Reserves, protected areas, etc) within or in close proximity to the HSA landscape, if any.
- Land ownership and institutional jurisdiction of key land uses.
- Important ecological networks within the HSA landscape including ecologically important small areas that may be interspersed within the production systems but still offer important connectivity.
- Ecological changes taken place during last 2- 3 decades (if possible, via historical remote sensing data).

1.3 Human Elephant & Other animals (Peacock, Monkeys etc.) Conflict

- Assess the status of HEC and other animals (Peacock, Monkeys etc) in the landscape over the last 10 years, it's magnitude, distribution and impacts.
- Analyze impacts of HEC and other animals (Peacock, Monkeys etc) on different groups in terms of impacts to community assets, livelihoods, access restrictions, women, vulnerable groups etc.
- Assess the impact of HEC on smallholder agriculture production including damages to tanks and irrigation infrastructure
- Study the root causes of HEC and other animals (Peacock, Monkeys etc) in the area and its historical background.
- Preparation of following maps;
  i) Areas subjected to HEC and other animals (Peacock, Monkeys etc) with its intensity, and distribution,
  ii) Existing elephant & other animals (Peacock, Monkeys etc) corridors and their locations in the landscape
  iii) Current elephant & other animals (Peacock, Monkeys etc) movement pattern within the area, that is known, to assess if these patterns deviate from corridors.
- Study people's attitudes on HEC & other animals (Peacock, Monkeys etc), traditional knowledge and practices on mitigation of HEC & other animals (Peacock, Monkeys etc.).
- Assess the current status of existing electric fences, its locations (whether it is on administrative boundaries or ecological boundaries) it's distribution, effectiveness and recommend actions for their improvements.

TASK 2: Key Ecosystem services & Economic Evaluation

Determine key ecological and ecosystem service zones within the landscape.

2.1 Carry out a full ecosystem service assessment for a sample of key representative ecosystems (based on the full list of ecosystem services identified within the Millennium Ecosystem Assessment, 2005) present within the Hambanthota District HSA landscape. The selection of sample ecosystems for service assessment should be agreed upon with the PMU.

2.2 Assess the economic values and opportunity cost of ecosystem services for each different ecosystem type in the representative sample identified in 2.1, with particular attention on those ecosystem services that strengthen agricultural resilience and farmer well-being in the concerned landscape.

TASK 3: Analysis of threats and opportunities for agroecological resilience in the Hambanthota District HSA landscape

- Based on findings of Task 1 & 2 and feasibility studies conducted by the PMU including ongoing and planned agro-developments of CSIAP, this section will identify key social and environmental challenges/opportunities within the landscape (existing and emerging) with long-term positive/negative implications on its ecological functionality, agricultural productivity and community well-being.
- The status with regard to resilience of the landscape to these identified key environmental challenges will be described explicitly. The past flood and drought production periods (over 10 years) will be looked at to identify changes in food production, adoption of alternative crops, etc.

- Landscape resilience will be defined and determined by a set criteria/indicator greed between the consultant and the PMU.

TASK 4: HSA Agroecological Landscape Resilience Plan (LRP) Development for the Hambanthota District HSA

- Identify and categorize time-based priority requirements (Short/middle/long) to enhance agro-ecological resilience in the Hambanthota District HSA landscape.
- Identify appropriate landscape level measures that can restore/enhance ecological functions by promoting practices that strengthen adaptation features at the landscape level (and thereby, greater resilience to the agroecosystems)
  - For example, opportunities for maintaining diversity through a mosaic of agricultural and natural habitats, conserving the remaining natural habitats, measures to improve ecological services such as buffer areas around farms, keeping forest fragments interspersed in production land with better connectivity, restoration of degraded lands, agroforestry etc.

- Based on the above, propose an agroecological landscape map indicating economic potentials, and ecological/watershed needs in the Hambanthota District HSA based on conservation/land management challenges/opportunities identified.

- Identify connectivity of the HSA to surrounding PA areas, highlight spatial gaps and opportunities for improving PA connectivity as a HEC mitigation strategy and also to improve landscape resilience through an effective ecological network. The assessment should particularly highlight the;

  - Habitat needs of flagship species and connectivity of forest.
  - Critical wildlife habitats/corridors/roosting sites etc.
  - High quality and conservation value ecosystems,
  - Important ecosystems to be amalgamated to existing PAs.

- Develop a HEC mitigation strategy for the HAS landscape based on the principles of the Action Plan of the Presidential Committee on HEC.
- Identify viable land management strategies and guidelines for identified ecological zones.
- Stakeholder engagement in the development of management plans for the Hambanthota District HSA landscape. The development of the ALRP will need to be participatory in nature and built on stakeholder consensus. As such, the consultant would be required to forge strong multi-stakeholder engagement and cross-sectoral dialogue development and implementation of the zoning plan.[2]

- Assess key stakeholder aspirations including that of farmer organizations in terms of the HSA landscape resources/benefits and preference for different landscape management interventions.
- Ensure participation of farmers including adequate representation of women and other vulnerable groups in consultations.
- Develop a Stakeholder Engagement Plan (SEP) targeting
  o effective and continued engagement of key stakeholders in developing and implementing the ALRP including having community feedback mechanism
  o improved collaboration between multiple management authorities and agencies

  o better understanding of impacts of HEC and common practices/existing mechanisms to cope with HEC.
  o Identifying potential opportunities for community contribution, use of participatory approaches and community monitoring of implementation of strategies.
  o Identifying potential land management strategies to address key conservation issues and to balance sustainable agro-development and conservation

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[2] The stakeholder forums will be set up by the CISAP/ PMU and stakeholder analysis has to be carry out by the Consultancy firm hired.

- Carryout a SWOT analysis to Identify policy, regulatory, socio-economic, institutional, technical and knowledge barriers/opportunities to achieving the proposed landscape level interventions and recommend measures to address these gaps.

TASK 5: Implementation Strategy for the ALRP
- Prepare an implementation strategy for the ALRP focusing on institutional, technical financial and stakeholder aspects which would enhance agro-production in the HSA. Should also build on outcomes of the SWOT analysis carried out under TASK 4.

4. REPORTS AND SCHEDULE OF DELIVERIES

1. The consultant shall deliver following deliverables as acceptable to the client.

2. The consultant will be expected to conduct workshops with relevant stakeholders as necessary and a final workshop with all stakeholders for the dissemination of findings and recommendations

No	Type of deliverables	Time frame
1	Inception report outlining the proposed work methodology, programme implementation timeline, team of consultants engaged and their program, organizational relationships and key contacts. In addition, it will indicate; • Each consultant's work programs • Schedule of field survey • Plan for stakeholder engagement • COVID contingency measures	Within 2. weeks from the date of Contract signed.
2	Detail map of the a digital format as shapefiles compatible with ArcGIS HSA showing current land use, key physical, ecological and socio-economic features including existing ecological networks (within the HSA and in the immediate surrounds), areas with high HEC prevalence, areas with poverty incidence, spatial distribution of production, non-production and settlement areas among others. The maps should be produced at a scale of 1:10000 to provide adequate detail and in version 10.1.	Within 10 weeks from the date of contract signed
3	Draft report on the Human Elephant Conflict in the HSA with recommendations for mitigation for discussion with relevant stakeholders. The report should include maps of i). Areas subjected to HEC with its intensity pattern, ii). Elephant home range and movement patterns and season, iii) Existing elephant corridors and their current status in the HSA landscape, if any.	within 12 weeks from the date of Contract signed
4	Draft structure of the Agroecological Landscape Resilience Plan for the HSA landscape.	within14 week from the date of Contract signed
5	Draft Agroecological Landscape Resilience Plan for the Hambanthota District HSA landscape including implementation and monitoring & evaluation measures	within 15 weeks from the date of Contract signed

6	Final Agroecological Landscape Resilience Plan for the Hambanthota District HSA landscape including implementation and monitoring & evaluation measures..	within 16 weeks from the date of Contract signed

Each of the above deliverables should be provided as 04 printed copies and e-copies in English both in Microsoft Word and PDF. The executive summary of the LRP needs to be provided in the following three languages: Sinhala, Tamil and English. (All raw data collected should be provided in MS Excel format).

5. PERIOD OF CONSULTANCY SERVICE

The total duration of this consultancy service is 16 weeks.

6.DATA, LOCAL SERVICES, PERSONNEL, AND FACILITIES TO BE PROVIDED BY THE CLIENTDATA,LOACAL

- ❖ Projects Information when necessary
- ❖ Necessary letters of introduction/travel permit to the consultancy team whenever necessary to collecting data and travelling.
- ❖ Workshop facilities for the dissemination of findings and recommendations to stakeholders whenever necessary.

6. INSTITUTIONAL ARRANGEMENTS

1.The Consultant will submit all deliverables directly to the Project Director, Climate Smart Irrigated Agriculture Project (CSIAP) as described in the table given below.

2.A review committee will be appointed by the Project Director - CSIAP to review each deliverable submitted by the consultant and the committee would be constituted to monitor the progress and interact with the consultant on key findings and results. The team may also seek comments and inputs on the consultant's work.

## 7. TEAM COMPOSITION AND QUALIFICATION REQUIREMENTS FOR THE KEY EXPERTS

	Position	Professional qualifications and experiences
KE-1	Team Leader & Landscape Management Planning Specialist	Extensive knowledge in the field of Landscape planning /Land use planning/Geography/ forestry/Natural Resource Management with an advanced degree in Geography/Land use Planning/Natural Resource management or any other relevant field. At least 10 years of broad working experience of Land use/Landscape planning, Watershed management, Forestry or Protected area management will be preferred. Experience in developing a macro-level landscape management plan for a broad agro-ecological landscape will be advantageous.

KE-2	Human Elephant Conflict Management Specialist	Extensive knowledge and experience in wildlife ecology particularly in elephant behavior, elephant habitat management & human-elephant conflict. At least, 10 years of relevant working experience.
KE-3	Agroecologist	Hold at least a postgraduate degree in agroecology or related fields, with at least 10 years' field level experience on same disciplines specially in landscapes with protected areas, plantations (Tea/Rubber/Cinnamon etc.) and with multiple land uses.
KE-4	Socioeconomic Development Specialist	Hold a postgraduate degree in Sociology/Socio-Economics/Community Development with sufficient knowledge and experiences (At least 10 years) on livelihood improvement and Community development activities in buffer zone villages of PAs.
KE-5	Ecology and Biodiversity Specialist	Hold a postgraduate degree in ecology or relevant field (biology, ecology, agriculture, natural resources management, etc) with at least 10 years' experiences in biodiversity and ecosystem services assessment.
KE-6	Environmental Economist	Hold a post graduate degree in Natural Resource Economics/Environmental Economics with 10 years experiences in economic assessment/environmental valuation of natural resources in different ecological zones.
KE-7	GIS Specialist	Hold a postgraduate degree in Land use/ GIS with 10 years experiences in Spatial Planning specially in forest-based landscapes.
The Consultants shall indicate the requirements of non- key professionals such as data collecting technicians and administrative activities separately		

8. OWNERSHIP

The consultant will have no right of claim to the assignment or its outputs once completed. Any reports/ research reports/ process documents produced as a part of this assignment shall be deemed to be the property of Client (CSIAP) and the consultant will not have any claims and will not use or reproduce the contents of the deliverables/ documents without the permission of the Client.

Annexure (I)

Hydrology of the Hotspot Area
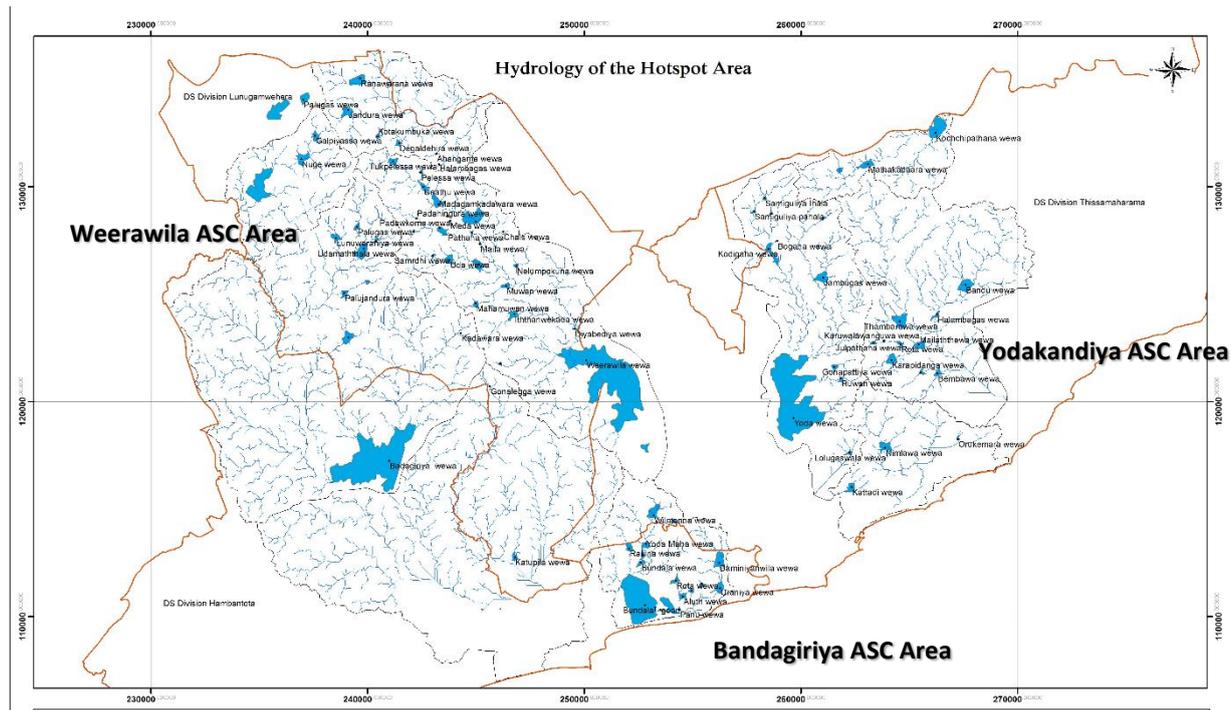
Province	District	DS Division	ASC	GND
Southern	Hambanthota	Hambanthota	Badagiriya	Bundala
			Yodakandiya	Kawanthissapura
				Joolpallama
				Uddakandara
				Kirinda
				Viharamahadeviepura
				Mhasenpura
				Ranakeliya
		Lunugamvehera	Weerawila	Muvanwewa
				Mihindupura
				Pannegamuwa
				Iththanwekada
				Padawgama
				unchiapppujadura
				Weerawil ara
				Lunugamvehera New Town
				Mahanagapura
				Senapura
				Bogahawewa
				Maththala
				Ranawaranawa
				Deuwamvehera