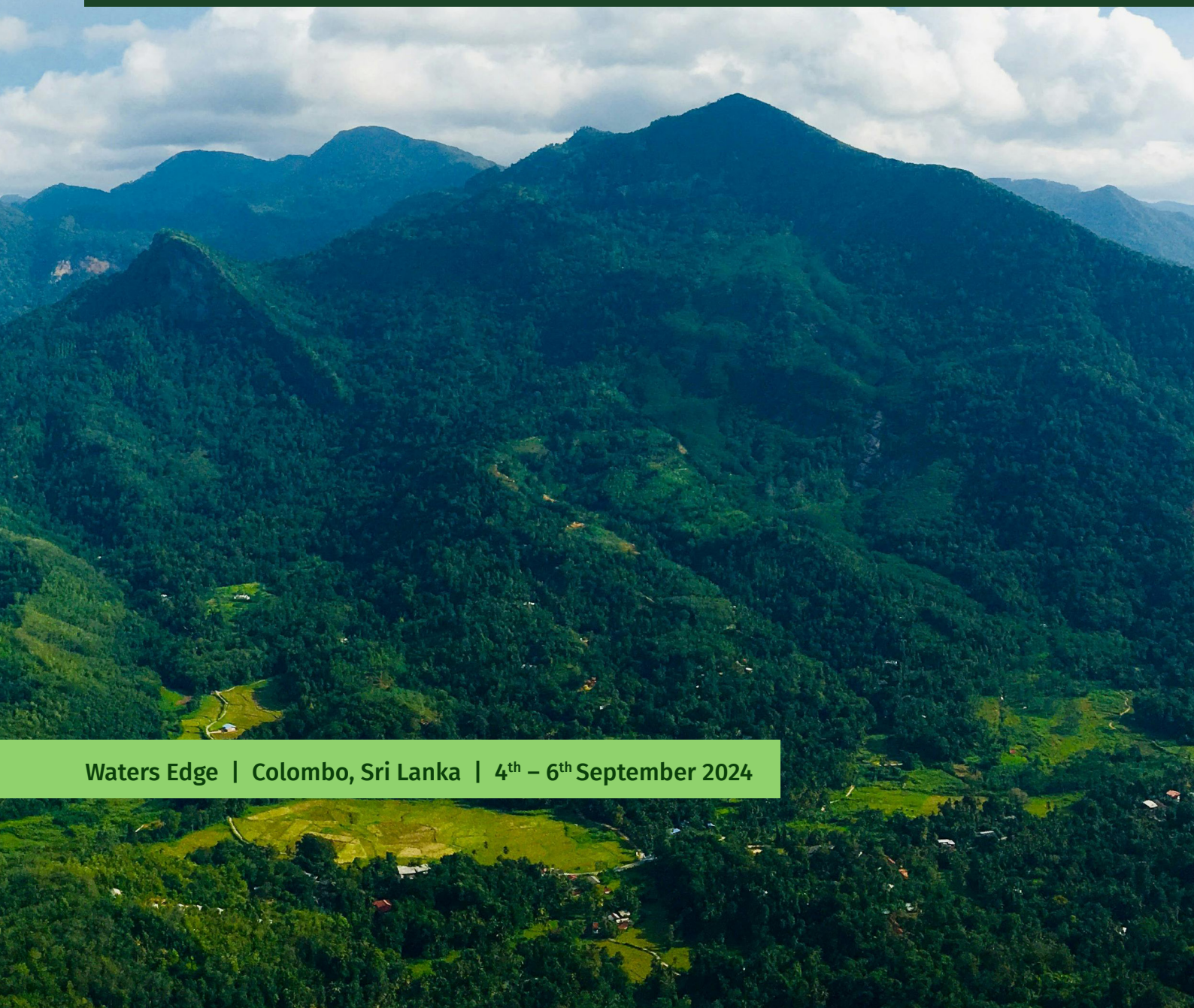
National Orientation Workshop of Green Climate Fund (GCF) Knuckles Partners on Upgraded Value Chain and Payment for Ecosystem Services



Waters Edge | Colombo, Sri Lanka | 4th – 6th September 2024

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Executive summary

In addressing the pressing challenges of climate change, the project "Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities of the Knuckles Mountain Range" plays a vital role by supporting the Government of Sri Lanka (GoSL) under the investment of Green Climate Fund (GCF). The project focuses on long-term environmental sustainability by establishing climate adaptation information portals and improving access to agriculture, water supply and affordable renewable energy. Implementing ecosystem services by enhancing product development, value-adding processes, farm business enterprises, market access and developing financial models to support payment for ecosystem services is also in the pipeline to ensure livelihoods.

The union of various project partners is the top priority to achieve the project's key objectives. Accordingly, the "National Orientation Workshop of Green Climate Fund (GCF) Knuckles Partners on Upgraded Value Chain and Payment for Ecosystem Services" was held to share knowledge on ecosystem services mapping, payment for ecosystem mechanisms and green value chain upgrading. Through a series of presentations, panel discussions and Q&A sessions, the workshop provided knowledge on theoretical concepts and frameworks and their practical application, enabling project partners to build technical capacities on the workshop topics. This was followed up by co-creation sessions where project partners identified key stakeholders and data requirements and developed collaborative strategies to implement mapping methodologies for ecosystem services, upgraded value chains and green markets assessments. Responsible stakeholders, availability of information, and data collection methodologies on ecosystem services, on-farm practices, off-farm and MSME sectors were documented. A ranking was given for the support and influence of partners engaged in the project, whilst opportunities and challenges in implementing project activities were identified with local and international experiences and expertise.

As the next steps, the focus was on integrating technology and data analytics, addressing the impacts of climate change, building resilience, promoting social equity and inclusive participation, addressing regulatory and policy impacts, identifying financing opportunities, analysing global market trends, and promoting consumer awareness when undertaking ecosystem services and green value chain mapping.

1 A description of GCF Knuckles project

The "Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities of the Knuckles Mountain Range" project is a critical initiative that supports the Government of Sri Lanka (GoSL) in addressing the pressing challenges posed by climate change in one of the country's most vulnerable and ecologically significant regions. The project focuses on enhancing the resilience of smallholder subsistence farmers and agricultural plantation communities residing in the vulnerable river basins, watershed areas, and downstream regions of the Knuckles Mountain Range Catchment.

The Knuckles Mountain Range is a vital ecological zone in the central highlands, often called Sri Lanka's hydrological heart. It plays a crucial role in water management across the island, with major rivers and irrigation systems originating here and influencing water availability throughout lowland regions.

This project is designed to mitigate the risks associated with climate change, including increased temperatures, altered rainfall patterns, and extreme weather events such as droughts, floods, and landslides. These challenges disproportionately affect small-scale farmers, plantation communities, and the natural ecosystems they depend on. By implementing climate-smart agricultural practices and climate-proofing ecosystems, the project aims to ensure that these communities can continue to thrive despite the changing climate.

Key components of the project include:

- Establishing climate adaptation information portals and advisory services to improve access to agricultural water supply and affordable renewable energy.
- Implementing best-fit options tailored to the specific ecosystems of the Knuckles region.
- Enhancing product development, value-adding processes, farm business enterprises, and market access.
- Developing replicable financial models and electronic transaction systems and incorporating ecosystem payments into planning as a resilience model.

The project will directly benefit approximately 1.3 million people, of whom 51.4% are women, by promoting diversified, climate-resilient livelihood options. Additionally, it will protect and strengthen 346,000 hectares of upland and lowland agroecosystems and natural ecosystems in response to climate variability and change.

The six-year project aligns with Sri Lanka's Green Climate Fund (GCF) investment strategy and the country's development plans, such as the Physical Plan for 2030. It is managed by a National Steering Committee (NSC), which ensures strict adherence to the regulatory requirements and governance mechanisms of the GoSL. The Ministry of Irrigation has committed to the meticulous execution of this project, ensuring the efficient and responsible implementation of all activities.

The project aims to foster transformative change in the Knuckles Mountain Range by building the resilience of vulnerable communities, protecting critical ecosystems, and ensuring sustainable development in the face of climate change. Through this comprehensive approach, the project will contribute to long-term environmental sustainability and improved livelihoods in one of Sri Lanka's most important natural regions.

2 Introduction to the workshop

2.1 Background

The project unites various partners to achieve the project's key focus, securing financing mechanisms for sustainable land management through green value chains and Payment for Ecosystem Services (PES) mechanisms. The partnerships focus on various aspects, so understanding the concepts thoroughly to ensure effective implementation is crucial. Accordingly, the workshop aimed to share knowledge about green value chain mapping and upgrading, ecosystem services mapping, and PES mechanisms with the implementation partners. This knowledge will enable partners to collaborate better to jointly achieve the project's goals of transformative change, replicable value chain models, and securing ecosystem payments.

2.2 Workshop format

The workshop was conducted 4th to 6th of September 2024, covering the following aspects;

- The theoretical orientation of frameworks and concepts is done through presentations, discussions, video materials, and Q and A sessions;
- Examples of practical applications through case study presentations, panel discussions, video material, and Q & A sessions; and
- Co-creation of implementation plans through Breakout groups and group presentations, and Q & A sessions,
- To collaboratively map landscape typologies, household socio-economic data, value chains, green markets, ecosystem services, and sustainable financing concerning the GCF Knuckles Project area.

2.3 Outcomes

- Gained a solid understanding of key concepts and current approaches in ecosystem services, upgraded value chains, and sustainable financing, laying the groundwork for implementing ecosystem services, value chain, and green market mapping.
- Identified practical opportunities and challenges specific to Sri Lanka in implementing mapping activities, ecosystem and value chain gaps and upgrading options, informed by local and international experiences and expertise.
- Developed collaborative strategies to implement mapping methodologies for ecosystem services, upgraded value chains and green markets assessments, with next steps and commitments from relevant stakeholders.

2.4 The welcome address and introduction to the workshop

"Identification of the options of payment for ecosystem services mechanisms and upgrading the value chain of smallholdings and plantation companies are the overwhelming interventions of the project along the pathway of sustainability. Providing a theoretical framework for project implementing partners, sharing experience from similar projects developed elsewhere and networking with each other to share expertise and experience among partners are the expectations of the workshop. The values earning from this workout will create a platform for upgrading the value chain and developing mechanisms for ecosystem service schemes both upstream and downstream of the Knuckles area ensuring integrated governance."

Prof. Fergus Sinclair - Director of Agroecology, ICRAF

Mrs Chandika Ethugala - National Project Director, GCF Knuckles

2.5 Keynote speech on the GCF Knuckles project

Pivotal role of integrated governance for implementation of GCF Knuckles project.

"The collaborative project is providing a transformative opportunity for a catalyst change towards a paradigm shift, encouraging ground-breaking research and motivation for impactful solutions through fostering collaboration and driving innovations. Integrated governance deploys a broader ecosystem for utilizing the fund in addressing world's pressing challenges of climate change, environmental degradation, social inequalities and governance gaps in a holistic approach. The responsibility of stakeholders is to leverage support to create meaningful and sustainable impact ensuring coherence, accountability and synergy among various components of an initiative through harmonizing efforts, aligning objectives, and fostering collaboration to achieve shared outcome for the project and the community. The robust management involves with integrated governance practices facilitates achieving the project objectives effectively and efficiently by aligning with goals, maximizing impact, and avoiding duplication of efforts while transparent monitoring and reporting are in line, ultimately enhancing the project sustainability and impact on climate resilience and low-emission development. Incorporating Green Value Chain principles into the project involves sustainable materials and practices and conducting life cycle assessments to reduce environmental impact in addition to the economic benefits."

3 Emerging issues and global trends on ecosystem services

Ecosystem Services (ES) are the direct and indirect contributions of natural capital that affect human wellbeing. Environmental, social, technological, and economic factors collectively shape emerging issues and global trends in ecosystem services. Of that, the key issues have been ranked as climate change impacts, biodiversity loss, land use change, ocean degradation, pollution of water and air, ES degradation and human health. Global trends focus on nature-based solutions, sustainable agriculture and food systems, and technological innovations such as remote sensing and artificial intelligence. Adhering to international and local policy initiatives such as biodiversity and climate conventions, community-led conservation protocols are effective strategies to be focused.

3.1 Landscape typology and agroforestry mapping

Mr Feri Johana - Green Growth Planning and Policy Specialist, ICRAF

Land Use and Land Cover (LULC) maps of an area provide information to help users understand the current landscape and spatial databases of agroforestry systems. LULC maps incorporate useful engagement tools to facilitate the quantification of various ecosystem services specific to different areas and trade-offs. This provides monitoring amenities and insights into impacts on human activities and natural processes while serving as evidence for evidence-based policy and management strategy development.

The general approach and frameworks of LULC consist of advanced tools like GEE and CA-Markov, utilization of satellite data and sensitivity analysis for sustainable land use mapping for ecosystem service assessments. The characteristics of regional typology and its applications involve measurable social, economic, and environmental aspects. Based on the availability of resources and information, the development of activity plans for the creation of maps and conduct of diversity analysis are essential steps to be followed.

3.2 Ecosystem services measurement and monitoring

Dr Ni'matul Khasanah - Ecological Modelling Scientist, ICRAF

Ecosystem services provide both tangible and intangible benefits that people obtain from them. Payment for ecosystem services offers a platform for exchanging ecosystem values between providers, intermediaries, and beneficiaries. It is important to communicate the value of nature to decision-makers in the hope of reversing or declining the status of ecosystem services. Classification of ecosystem services supports provisioning, regulation, and cultural focus on security, basic needs, health, and social relations.

The leading global initiatives of ecosystem services are referred to as Millennium Ecosystem Assessment (MEA), The Economics of Ecosystem and Biodiversity (TEEB), The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The measurable ecosystem services performing in topmost are climate regulation through carbon sequestration, water regulation through watershed management, harvested wild goods, cultivated goods, nature-based tourism, and recreation. Rapid Hydrological Appraisal (RHA), Rapid Carbon Stock Appraisal (RCSA), Soil Health, Quick Biodiversity Survey are practicable evaluation methodologies.

3.3 Ecosystem service mapping and investment

Dr Mieke Siebers - Executive Director, Foundation for Sustainable Development - FSD

Humans' benefits from nature have been classified as provisioning, regulating, habitat, and cultural. The current ecosystem valuation database consists of standardized values for all biomes and services on all continents. Experts have reviewed the database, and many studies are in the repository.

In building up a business case for nature, the economic and financial value of nature, risk management and mitigation, and innovation for increased resilience and long-term viability need to be considered. Ecosystem valuation depends on quantifying impacts and dependencies, calculating Total Economic Value (TEV) and projecting Net Present Value (NPV).

3.4 Ecological modelling and trade-off analysis

Dr Rachmat Mulia - Agroforestry and landscapes modeler, ICRAF

Multifunctional production landscapes are important for productive agriculture and forest products, ecosystem services for climate mitigation and adaptation, conservation and restoration, and social inclusiveness. Keys to developing a multifunctional landscape are negotiating with stakeholders, a landscape approach and trade-off analysis, translating scenarios into evidence, and scientifically based land use plans. Green development, red development, conservation, and collapse are possible impacts of land use scenarios where the land use dynamic simulation tool R FALLOW (Forest Agroforest Low-Value Landscape or Wasteland) is available.

Applying R FALLOW to develop a roadmap for sustainable agroforestry with cacao in the southern Philippines showcases a successful trade-off between income per capita and carbon storage.

3.5 Findings from the LUPPD mapping exercise

Mr Kaushika Hettiarachchi - Mahaweli Authority of Sri Lanka

Land use and land cover have been analysed for exemplar areas of the project. Participatory Rural Appraisal (PRA) tools have been utilized to collect data on agricultural lands, plantations, water resources, animal and plant species, tourism, women, and children. Transect walks and stakeholder meetings were implemented to map various spatial elements. Land ownership, slope, stream order, flow accumulation, sediment transport index, and topographic wetness index have been developed.

3.6 Introduction to data management and visualization platform and capabilities of GCF Knuckles

Mr Arjuna Seneviratne - Consultant, Project Management Unit – PMU & Dr Tor-Gunnar Vagen - Geoinformatics Senior Scientist/Head of SPACIAL Unit, ICRAF

Data management has major problems due to a lack of understanding, sharing, accessibility, quality assurance, integration, and outmoded and outdated data. Building a data culture is timely for improved decision-making, enhanced agility and performance, and innovative and competitive advantage. Introducing a generalized data mapping scenario via focus group discussions (FGDs) and surveys is essential for stakeholder mapping and characterization along the value chain.

3.7 Discussion

Q: Any linkage between ecosystem services to national GDP?
A: Land use changes, especially crop production impact the future regional economy and could be assessed through a tool 'Lumens.'
Q: Is PES implemented in Philippines?
A: Presently exploring the benefits of carbon credits in the Philippines. Acorn acts as a connector for smallholders and buyers of carbon credits. Valuing USD 20 per carbon ton and shared between farmers (80%), administration (10%) and local partner (10%).
Q: How to justify referring farmers to sustainability practices while remaining with marginal financing during the initial stage of the cultivation?
A: Only marginally viable projects are qualified for sustainability.
Q: Is international carbon trading allowed, where NDCs are specific to a country?
A: NDCs refer to a very small amount of carbon credits for neutrality. More than enough credits could be generated over that, unless not traded internationally they will expire.

3.8 Potential actionable points

- Development of activity plans for creating LULC maps and conducting diversity analysis based on the availability of resources and information in the project area.
- Assessment of ecosystem services of the project area: carbon sequestration, water regulation through watershed management, harvested wild goods, cultivated goods, nature-based tourism and recreation using above mentioned methodologies.
- Application of advanced tools to classify landscapes and mapping agroforestry of the project area in the process of quantifying ecosystem services.
- Application of R-FALLOW simulation tool in developing road map for sustainable agroforestry in Knuckles project area.
- Provide the framework and visualization of the GCF Knuckles database digital platform, including its future operationalization and business model, and connect to other databases with similar thematic information in Sri Lanka.

4 Emerging issues and global trends on PES and upgraded value chain

PES and value chain upgrades are increasingly recognized as important mechanisms for promoting sustainable development and conservation. Emerging issues and global trends are evolving due to the integration of technology, climate action, social equity, innovative funding, regulatory frameworks, and changing consumer behaviors. These trends reflect a growing recognition of the need for sustainable development that balances economic, environmental, and social objectives.

4.1 Payment for ecosystem services and sustainable financing schemes and global experiences/ case studies

Dr Beria Leimona - Lead Scientist Component 2 GCF Knuckles Project, ICRAF

The Payment for Ecosystem Services (PES) agreement requires substantial facilitation and negotiation efforts. It emphasizes ecosystem service outcomes and fosters reciprocity, trust, and co-benefits for smallholders.

Ecosystem service performance is evaluated based on compliance and impact assessment, providing evidence for causal relation between land use and ecosystem services. It is effective at the local level, where diverse participation is secured. Livelihood performance is evidenced by the existence of positive impacts and the absence of negative welfare effects. Successful ecosystem service stewardships guarantee the rehabilitation and protection of landscapes.

Different PES designs and implementation protocols are available, and lessons learned from cases of the US, Costa Rica, Vietnam, Indonesia, India, and African countries are worth studying.

4.2 Upgraded value chain and agribusiness models for subsistence and smallholder farmers

Prof. Jeevika Weerahewa - Senior Professor in Agricultural Economics, University of Peradeniya

A sustainable value chain is imperative to generate economic, social, and environmental impacts. Agribusiness models could effectively connect farmers to markets and value chains. Success stories in the development of agricultural value chains are found in the Philippines, China, Croatia, the Dominican Republic, and Nepal.

Value chain mapping involves collecting primary and secondary data on a selected value chain's primary and secondary activities. Analyzing this data enables the selection of feasible interventions which lead to more sustainable green value chains.

4.3 Micro Small Medium Enterprises' (MSME) upgraded value chain and business models, and market assessments

Mr Vikum Rajapakse - Consultant, Project Management Unit

The value chain involves various business activities and processes that create products or services. Value chain analysis involves identifying these activities, determining the value created and costs incurred, and identifying opportunities for competitive advantage. A successful value chain generates sufficient value across the three key stakeholder groups, generating supplier surplus, firm margin, and customer delight.

Hierarchical needs such as functional, emotional, life-challenging, and social impact influence the

value customers are ready to pay. Identifying these is essential to designing, producing, packaging, branding, marketing, and selling a successful product. Regenerative and redistributive designs help develop products that heal the environment and reduce economic and social disparities of those involved in the value chain.

4.4 National and sub-national programs on MSMEs and upgraded value chains in Sri Lanka

Dr Sampath Induruwa - Department of Export Agriculture - DEA

The development of the value chain of Export Agricultural Crops (EAC) commenced with the establishment of new cultivations, the development of central and private nurseries, the improvement of productivity of EAC lands, and home gardening programs. Postharvest processing and crop value addition programs have been performed, and certification systems such as Organic, GMP, HACCP, and ISO 22000 have been deployed.

The significant and strategic value-added EAC products in Sri Lanka are pepper, nutmeg, cinnamon, ginger, coffee, cocoa, turmeric and areca nut. Monitoring is tenable throughout the value chain: input level, product level, collection procedure, processing, transportation, marketing, etc.

4.5 Generating value through regenerative approaches to agriculture and value addition

Ms Sonali Pandithasekera - Chief Finance Officer, Serendipol

The regenerative approach ensures farming's positive impact on climate change, which reverses deforestation, biodiversity loss, and a surge in carbon emissions. It creates regenerative integrity between nature, farmers, projects, and investments.

The organization's regenerative management practices include piloting mixed-crop agroforestry farms, expanding its regenerative portfolio of products, optimizing the production process to minimize waste, and digitizing the supply chain on Blockchain for enhanced transparency.

4.6 Sri Lanka green finance taxonomy; relevance for agri, forestry and water management sectors

Mr Adeesha Perera - Head of Sustainability, Union Bank

Financing taxonomy can be classified based on the objectives: Green Finance Taxonomy, Social Finance Taxonomy, Sustainable Finance Taxonomy, Transition Financing Taxonomy, etc. It provides signal to investors/financiers and markets (especially private sector companies) on activities that are prioritized for financing. It provides a set of standards and criteria that prevent market actors from Greenwashing or Lip service. It helps to assess and quantify the impact of financing activities, enabling transparent disclosures and enabling researchers to assess the effectiveness of the financial system in delivering sustainable developments.

Sri Lanka Green Financing Taxonomy covers environmental objectives such as climate change mitigation, climate change adaptation, pollution prevention and control, ecological conservation, and resource efficiency. The guiding principles include provision to substantial contribution, Do No Significant Harm (DNSH), respect Sri Lanka Green development priorities, science-based screening, compatibility with international standards and practices and dynamic adjustments.

4.7 Experiences of PES in Sri Lanka

Mr Leel Randeni - Director - Climate Change, Ministry of Environment

Payment for Ecosystem Services (PES) involves of paying the land manager either financially or non-financially for the environmental services provided by the land. The PES model is based on the principle that those who derive benefits should be compensated. Recently, the use of PES conservation projects in both developing and developed countries has grown widely.

In line with this, PES and PES-like mechanisms have been implemented and proposed for Sri Lanka. Success requires ensuring that local ecological, social, cultural, and economic dynamics are closely observed and integrated into these mechanisms.

4.8 Developing forestry-based carbon trading project with smallholder farmers – actions, constraints and potential solutions

Dr Enoka Munasinghe - Principal Research Officer, Rubber Research Institute of Sri Lanka

Carbon trading is a type of emission trading scheme designed for greenhouse gases (GHGs) to limit GHG emissions to meet the pledges under the Paris Agreement. It can be taken as a PES that deals with Compliance and Voluntary carbon markets.

Rubber Research Institute of Sri Lanka has developed a project for Verified Carbon Standards (VCS) based on the new rubber cultivations established in Eastern and Uva Provinces of Sri Lanka.

Bottlenecks to implementing such projects under Sri Lankan conditions include low awareness, lack of fund allocation and investments, low expertise and experience, lack of collaboration among government organizations, gaps in modalities, and risk and uncertainty.

4.9 Potential actionable points

- Application of suitable PES designs and implementation protocols practiced elsewhere in favor of the project.
- Effective adoption of success stories of the upgraded value chain and agri-business models elsewhere for developing MSME sectors in the project area.
- Application of regenerative and redistributive designs in value addition to secure equitably in the society.
- Application of green financing technology for agroforestry and water management of the project area.
- Development of a carbon trading project for the carbon stocks in the project area through suitable modalities upon the lessons learnt.

5 Panel discussions

Talk show 1: upgrading smallholder, subsistence farmer, and MSME green value chains through regenerative practices, innovation, and standards in the food, beverage, wellness, and tourism sectors

Panelists:

- Mr Vihangun Ariyaratne (Chief Operating Officer, GoodLife X)
- Ms Sonali Pandithasekera (Serendipol)
- Dr Jairo A. Villamil-Diaz (International Senior Specialist, Directorate of Technical Cooperation & Sustainable Industrial Development, UNIDO)
- Ms Sashika Kaluwahewa (Head of Sustainability, Jetwings)

Points highlighted:

- Values and models introduced for MSME – approaching thrive business model through regenerative mind-setting and regenerative purpose to develop entrepreneurship.
- Readiness to pay a premium for enhanced values – the ability to display the environment and social value of the product and beyond.
- Responsible engagement with the community – prioritizing local sourcing in the value chain, uplifting local resources, youth development and ensuring employment, and augmenting women entrepreneurship.
- Lessons learned in upgrading value chain – consideration of customer preference, coordination and preparation, environment safety, social welfare, and recognition.
- Certification systems placed in the project – internationally recognized systems for exportation with accreditation, locally recognized indices to obtain Geographical Indication (GI).
- Ensure conformity to standards – eliminating intermediaries in value chain and internal monitoring and auditing.
- Managing the carrying capacity within the boundary – concept design for infrastructure development and self-sustaining operationalization.
- The top policies to be upgraded to flourish the MSME – policies for acceleration of the government regulations related to agriculture and tourism, deployment of knowledgeable and experienced human capital.
- Expanding the certification system to smallholders – the operator needs to get the responsibility.
- Linkage of artisanal products and global market – competitive advantage to enter niche market with innovative approaches.

Talk show 2: potential of payment for ecosystem services in Sri Lanka, sustainable financing for strengthening climate resilience of subsistence, farmers and agricultural plantation communities

Panelists:

- Mrs Chandika Ethugala (National Project Director, GCF Knuckles)
- Prof. Prasanthi Gunawardene (Professor in Environmental Economics, University of Sri Jayewardenepura)
- Mr Vidura Sonnadara (The Ceylon Electricity Board)
- Mr Adeesha Perera (Head of Sustainability, Union Bank)
- Mr Chandana Wanigasena (Vice President - MSME DFCC)

Points highlighted:

- Project expectations – sustainability of vulnerable communities in the Knuckle project area through developing 23,000 self-sustained PES recipients and green value chain enhancement.
- Human capital availability for implementation – evidence for existence is limited, however, an immense potential for valuing PES exploring real economic values.
- International perspectives and success stories – pioneer systems available in PES contextually for countries where green financing and scientific knowledge prevail.
- Possibility of having PES programs (In CEB context) – a transformative tool between the community and the company in compensating and restoring vulnerable ecosystems through PES.
- Contribution of green financing taxonomy – possibility of operationalizing in agro-forestry, biomass, and tourism sectors upon the means of adoption by private sector and public sector.
- Challenges encountered in launching loan schemes at PES – the willingness to pay (WTP) depends on climate vulnerability and discrepancies through value chain, therefore placing inputs in the correct manner is essential in addressing challenges.

6 Experience and progress in Sri Lanka

Sri Lanka has a rich experience with ecosystem services due to its diverse landscapes, therefore, the country has an immense potential in benefiting back with payment for the services they provide. Forest ecosystems provide a wide range of biodiversity conservation, carbon sequestration, and water regulation and non-timber forest products. Agroforestry systems consist of traditional farming practices which preserve many ecosystem services Marine and coastal ecosystems are imperative in mangrove restoration and conservation, supporting tourism and fisheries. PES and community-based approaches provide incentives to manage and protect ecosystems and livelihood diversification programs such as eco-tourism, organic farming, and handicrafts securing effective outcomes. Climate adaptation and resilience supported with restoration of degraded lands and mangroves in terms of the reduction of disaster risk is in pipeline.

The country has adopted policies that recognize the importance of ecosystem services, such as the National Environmental Action Plan and various forest policies that include sustainable management and community involvement.
Sri Lanka has benefited from collaborative partnerships with international organizations like the UNDP, IUCN, BioFin and FAO, which support programs that promote sustainable development, biodiversity conservation, and payment for ecosystem service.

Some initiatives taken towards initiating payment for ecosystem services in Sri Lanka;

- Payment for Ecosystem Services Pilot program for watershed conservation.
- Participatory forestry on degraded forest lands.
- Upper Watershed Management Project (UWMP).
- Renewable energy for rural economic development projects.
- Conservation and sustainable use of medicinal plants in Sri Lanka.
- Conservation of biodiversity and water resources in the Knuckles range of forests.
- Climate change enabling activity projects.
- Modeling soil erosion and hydropower linkages of Rantambe reservoir, Sri Lanka towards;
- Payments for ecosystem services.
- Redirecting value from stored water to protect watersheds in Sri Lanka.
- Carbon trading project for rubber cultivation in Uva and Eastern provinces of Sri Lanka.

7 Stakeholder mapping exercise

Breakout session 1.1: basic stakeholder analysis – payment for ecosystem services (annex 1)

Fifty-three stakeholders, including government agencies, non-government organizations, the private sector, academia, development agencies, communities, etc., were identified as associated with establishing and operating a payment-for-ecosystem mechanism within the project's scope. Then, the level of influence and support of these stakeholders was mapped on a scale of 1 to 4, with 1 being the lowest level and 4 the highest.

The majority (73%) of stakeholders ranked levels 3 and 4 for support, denoting them as essential to achieving the project's PES outcomes. Only 2% of the stakeholders were categorized into the no-support group. Following a similar pattern, a majority of the stakeholders were deemed to be influential on the project's PES outcomes, with 63% ranking levels 3 and 4 for influence.

The exercise also categorized stakeholders by nationally, provincially, and divisionally significant stakeholders.

Breakout session 1.2: basic stakeholder analysis – value chain (annex 2)

One hundred stakeholders, including government agencies, non-government organizations, the private sector, academia, community-based organization, etc. were identified as associated with establishing and upgrading green value chains within the project region. These stakeholders were first categorized by their national, provincial, and divisional level significance. Then, the level of influence and support of these stakeholders was mapped on a scale of 1 to 4, with 1 being the lowest level and 4 the highest.

Sixty-three per cent of stakeholders ranked 3 and 4 for their support of the project's green value chain outcomes, while only 4% ranked no support. On the other hand, the level of influence over the project was comparatively equal among the stakeholders.

8 Recommended data and information collected

Breakout session 2.1: ecosystem service contextual baseline (annex 3)

Contextual baseline data for ecosystem services was categorized into ten types: water reservoirs, groundwater, surface water, biodiversity, geological and soil, plantations, crops and livestock, visitation, education and research, biodiversity issues, climate data, disaster data, and home gardens and other synthetic ecosystems. Existing data sources to achieve the above baselines and methods of data collection were documented. Barriers involved in the exercise and potential solutions have been identified.

Breakout session 2.2: socioeconomic and on-farm practice baseline (annex 4)

The five capital resources — financial aspects, land and other natural aspects, physical conditions, and social and human conditions involved in on-farm activities—were considered for baseline data. The nature of data types, persons managing the data, and data collection methods were investigated. Barriers involved in the exercise and the types of barriers were documented.

Breakout session 2.3: off-farm and MSME baseline (annex 5)

Baseline data for the off-farm and MSME sectors are described in seven categories: MSME population, raw materials, operations, marketing and sales, value propositioning, secondary sources, and distributions and logistics. Existing data sources and data collection methods were identified, along with evolved barriers and potential solutions.

9 Closing and next steps

The project's key focus is securing financing mechanisms for sustainable land management through green value chains and PES mechanisms. Thus, various partners are expected to be united on different aspects. The workshop addressed this focus by providing an understanding of the concepts and theoretical frameworks to ensure effective implementation, enabling partners to collaborate better to achieve the project's goals. Presentations, panel discussions, and Q&A sessions addressed this. Breakout sessions and group presentations also experienced co-creation of implementation plans.

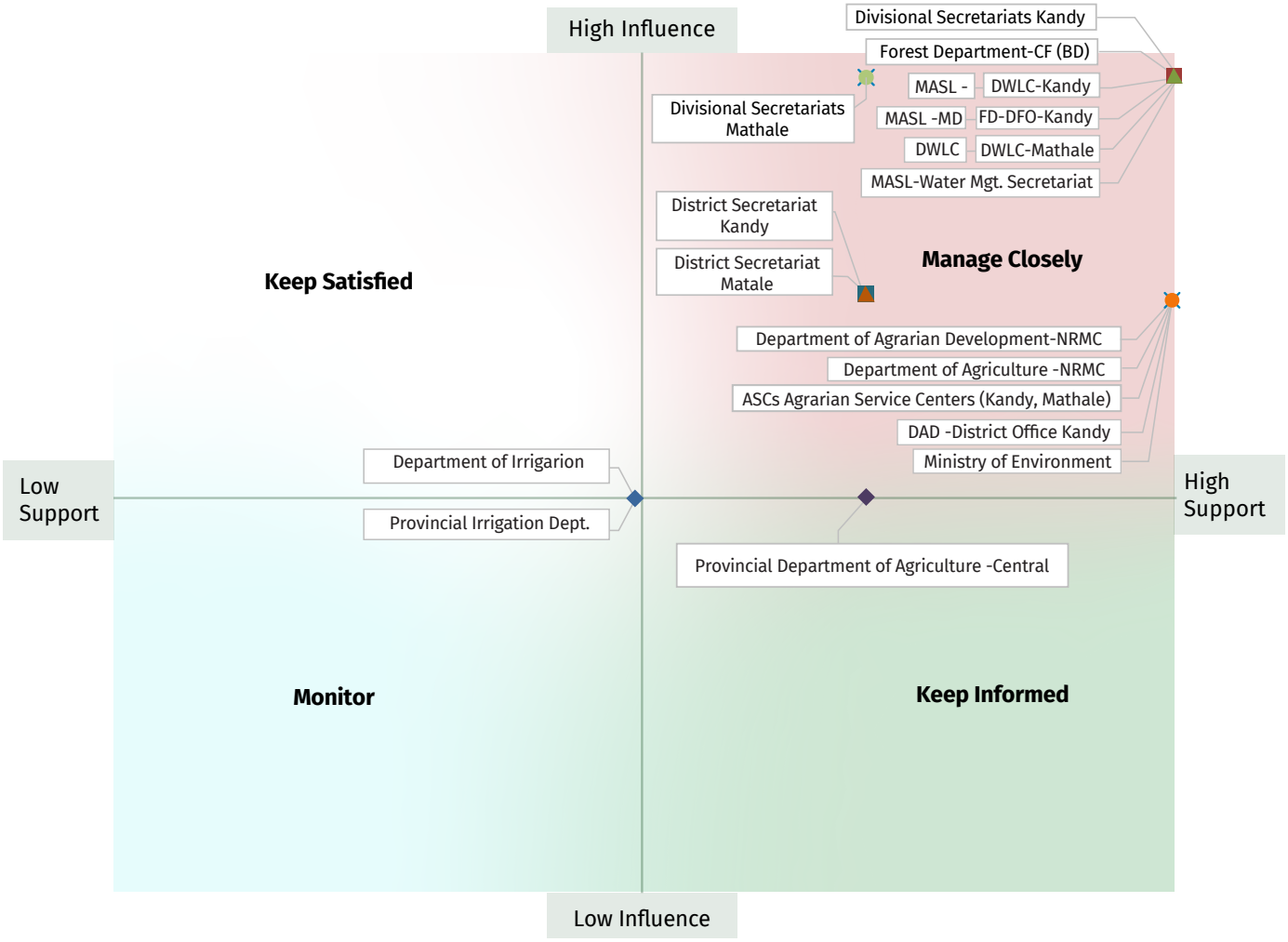
Participants gained a solid understanding of key concepts and current approaches in developing concrete, collaborative strategies to implement mapping methodologies for ecosystem services, upgraded value chains and green markets assessments. Stakeholders, data availability and collection methodologies on ecosystem services, on-farm practices, and off-farm and MSME sectors were documented. Support and influence of stakeholders associated with the project were ranked, and practical opportunities and challenges specific to the project area in implementing payment for ecosystem services and upgraded green value chains were discussed vis-à-vis local and international experiences and expertise.

Next steps and commitments are to be focused on;

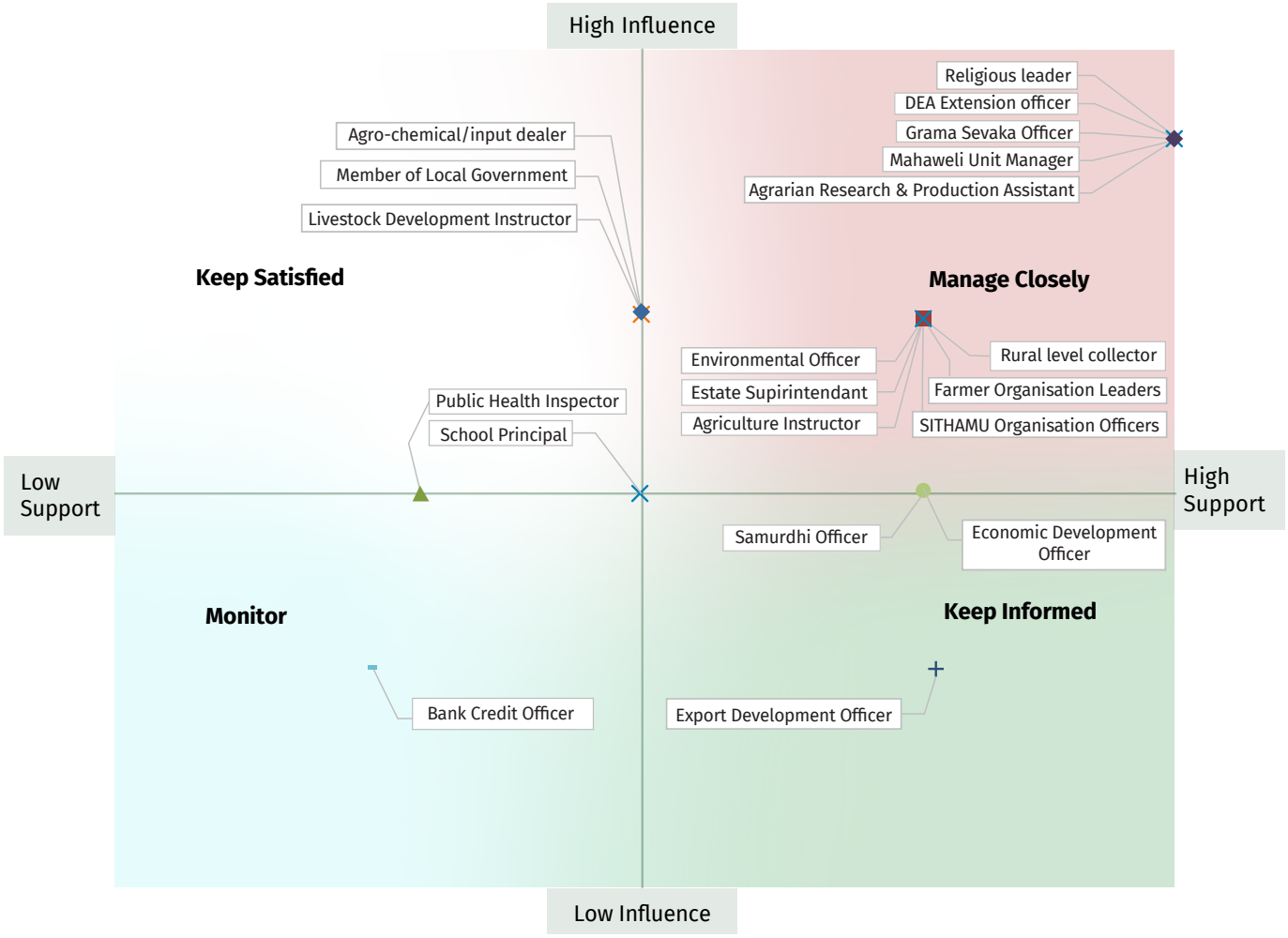
- Integration of technology and data analytics – usage of blockchain for transparency in tracking payments and PES schemes, advancements in satellite imagery and Internet of Things (IoT) for real-time monitoring and data-driven decision-making for identifying inefficiencies, forecasting demand, and improving supply chain resilience.
- Climate change and resilience building – incentivizing stakeholders for carbon storages through carbon markets, offering PES schemes for diversified services like water regulation, soil health, biodiversity, etc. and contributing ecosystem resilience with community adaptation to climate impacts.
- Emphasis on social equity and inclusive participation – including local communities and indigenous knowledge for ensuring PES for fairly distributed approaches with gender responsive initiatives and contributing social equity.
- Blended finance – establishing Public-Private Partnerships (PPPs) to attract private investment by sharing risks, combining resources, and promoting impact investments with social and environmental returns along with finance.
- Regulatory and policy initiatives – providing tax incentives, subsidies, and legal frameworks to facilitate ecosystem conservation and sustainable land management and applying certification schemes to provide credibility.
- Global market trends and consumer awareness – creating consumer demand for sustainably sourced and certified products and promoting sustainable sourcing and circular economy to reduce waste, reuse resources, and minimize their environmental footprint across the value chain.

Annexes

Annex 1. Basic stakeholder analysis - Payment for Ecosystem Services (PES)



Annex 2. Basic stakeholder analysis – value chain



Annex 3. Ecosystem service contextual baseline

Item	Type of data (spatial/tabular)	Existing source	Mtd of data collection	Barriers	Solutions
Water (Reservoirs)	Volume/Quantity	MASL, DAD & ID/PID/ National Water Supply & Drainage Board, DWLC/ Universities/IWMI/IFS/ITI/ NBRO/NBSAP/CEA	Existing data is acquired through direct request	Difference in format	Converting the data format after having discussions
	Ouality	MASL/Water Supply & Drainage Board	Through Surveys and access existing data	No consistensy and regularity of data within MASL	Review existing protocoal and make necessary arrangeents to collect primary data accordingly
	Quantities demanded by different user groups (Considering seriel usage), sectors demand and the amounts of energy produced	CEB/MASL/ID/PID/DAD	Through Surveys and access existing data	Unknown	Studying the existing data, and their format
	meteorological & hydrological data,	Department of Meteorology	Met Data	Expensive	Improve the inter institutional coordination
	Pollution Data (Quantities discharged by polluters)	CEA	Through Surveys and access existing data	Confined to industries	Conduct primary data collection surveys
Ground Water	Quality parameters (Chemical,biological & physica), Recharge, Spatial & temporal distribution	Water Resourses Board	Primary & Secondary Data	Not covering the project entire project area	Conduct primary surveys
Surface Water	Water flow/ Discharge (Peak flow, dry season flow), Sediment discharge, quality parameters (Chemical,biological & physical), Distribution of large, medium, and small tanks, canals, springs, spouts	Water Supply & Drainage Board, RDA, Irrigation Department	Primary & Secondary Data	Not covering the project entire project area	Conduct primary surveys
Biodiversity	Species, genetic, and ecosystem diversity	NCR/NBSAP/NFI Data/ Forest Cover Data/ Kala oya BD Base line Survey/PGRC/Red List/ IUCN Publication/ESA outside PAs/MASL data/ CEA publication/LUPPD/ NGOs & INGOs/Groups of wildlife researchers & enthusiasts/NARA/ NAQUADA/Universities/ Research data and institutes/Botanical Gardens/Zoological/DWLC Departments/MEPA/CCD/ Fisheries/BDS	Primary & Secondary Data	Difficulties in acquiring data and poor coordination	Developping information sharing portals through technical & financial support programs

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Annex 3. Continued

Item	Type of data (spatial/tabular)	Existing source	Mtd of data collection	Barriers	Solutions
	Landscape diversity/ Cultural diversity	LUPPD/Universities/DS/ Census & Statistic Reports	Primary Surveys & through existing data bases	Poor Resolution & Accuracy	Upgrading the technology used for mapping and information collection. Use of drones with LIDAR, & Multi Spectral, Sensors
	Invasive Spp Availability & Distribution	BDS-MoE/IUCN/ Universities/Botanic Gardens Dept/Zoological Gardens Dept	Secondary Data	Not Identified	Continuing the researches
	ES quantification & valuation (provisionning, regulating, cultural, and supporting services)	NCR	Primary Surveys and Ecosystems Service Modelling using Apps	No Data/ Insufficient human capital	Conduct primary surveys/Train relevant officers
Geological & Soil	Soil types/soil structure/soil erodability/physical chemical biological parameters/Soil Moisture/soil pollution types and severity/ Spatial distribution/ formation rates/ erosion rate/ infiltraion/ percolation/Mining/ Desilt/	GSMB/MASL/NBRO/ ID/PID/NRMC/Gem & Jeweleries/Gem & Jewellery Research/NRM division of MOE	Primary & Secondary Data	Un organized and scattered data	Developping information sharing portals through technical & financial support programs and improve the coordination among agencies
Plantation	Species/ Distribution/ES valuation/Extents of planted/abonded & underutilised	Ministry of Agriculture and Plantations/FD/STC/ Plantation Companies private & State owned/ Janawasama/LRC/TRI/ RRI/CRI/TSHDA/RDD/CDA/ CCB/Agroicultural Sensus data/Sensus & Statistics	Primary & Secondary Data	Un organized and scattered data	Developping information sharing portals through technical & financial support programs and improve the coordination among agencies
Crops & Livestocks	Crop types/Supply and amounts of Exports/Livestock records/LDI & AI records	DoA/MASL/NLDB/DAD/ DaPH/Regional Vet Surgeons/ID/PID/DEA/ Universities/Research Institutes/Customs/Tea & Rubber Auctions	Primary & Routine progress reports, Farm Records	Repettition of data and poor clarity, Unorganized data	Conduct Primaty Survays to enhance the clarity of the data and to avoid the repettition
Visitations, Education & Research	Quntities/Carrying Capacities/Gate Prices/Income/ Visitor Geographies	SLTDA/FD/DWLC	Primary & Secondary Data	Unavailability of well established tourism industry within the Project area. So, finding reliable information may be difficult	Conduct surveys with local & foreign visitors, hotel, shop, & homestay owners

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Annex 3. Continued

Item	Type of data (spatial/tabular)	Existing source	Mtd of data collection	Barriers	Solutions
Biodiversity issues	Human Wildlife Conflicts	DWLC/FD/CEA/DS/Local Authorities	Primary & Secondary Data	HEC data are available but others are missing	New Surveys need to be conducted to gather the data about Human Wildlife Conflict despite the HEC
Climatic data	Solar radiation/wind speed/temperature/ rainfall/evaporation/ transpiration/Climatic impacts	Met Department/MASL/ ID/PID/DAD/CCS	Primary & Secondary Data	Less familiarity and limited access	Make climate data more familiar with personnel
Disaster data	Forest Fire damages (Extents, value,) flood/landslides/ vulnerability	FD/DMC/NBRO/DWLC/ ID/PID/DS/Ag Insuarance Board/	Primary & Secondary Data	Poorly organized and limited capacities in forest fire moddeling	Organize the data and train the officers with forest fire models
Home gardens & Other Manmade ecosystems	Diversity/ Production/Income/ Change	DS/GN/Primary Data/ DAD/MASL/Agri. Res. Prod. Assistance	Primary & Secondary Data	Unavailability of good baseline database	Establish a sound baseline database with primary surveys

Annex 4. Socioeconomic and on-farm practice baseline

Name	Type of data	Existing source/who collect	Method of the data collection	Barriers	Solutions
Financial/Capital					
Access to credit and finance	finance	District Secretary	Survey		
Recipient of the welfare programme of the government, elderly allowance	finance	DS	AG OFFICE/ Resource Profile		
Fraction of farming income from the total income	finance	DAD/MASl	Survey		
Agriculture assets	finance	DAD/MASL/DEA	Survey		
Dependency on NTFP as income	finance	FD/DEA	Survey		
Existence of NTFP permits	finance	FD/Kithul Dvt Authority	Survey (farmer side) & KII (FD)		
Access to agriculture insurance	finance	AIB(Agriculture Insurance Board	Survey (farmer side) & KII (Companies)		
Type of GAP A or GAP B certifications obtained by farmers (pepper, cinnamon, coffee, nutmeg, ginger, tumeric, clove, cocoa) - 2 years, recurrent farmers?	finance	DOA/DEA	Survey (farmer side) & KII (DEA/DoA)		

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Annex 4. Continued

Name	Type of data	Existing source/who collect	Method of the data collection	Barriers	Solutions
Marketing outlets for farmers with GAP certificate (offtakers)	finance	DOA/DEA	Survey (farmer side) & DEA/ DOA		
Price of products	finance	HARTI/DEA	Survey (farmer side)		
Proximity to market	finance		Survey		
Souce, quality and price of agri-inputs	finance		Survey		
Exiting and willingness to expand the production	finance		Survey		
Capitals and access to inputs	finance		Survey		
Potential for agroecotourism: income	finance		Survey		
Design of agroecotourism, spice garden, traditional processing/artisan/hand-made tea, bee honey production	finance		Survey & KII - Community leaders, KRUPANISA		
Land and other natural aspects					
Soil health data (Fertile Lands)	natural	DOA	LDSF/Survey		
Existance of ayuverdic products	natural		Dpt of Indegeneous medicine/ Survey		
Type of planting materials: self seed production or external	natural	DOA/DEA/ MASL	Survey		
Farming seasons	natural	DOA	Survey		
Type of crops and livestocks	natural	DOA/DAD/DEA/ MASL/DAPH	Survey		
Quality of the produces	natural		SLS/GAP and Survey		
Cultivation plan/cropping plan adjusted to the climate	natural	DOA/DEA/ MASL	Survey		
Source of irrigation systems	natural	ID/DAD/MASL	Survey		
Tree density in the farm	natural		Survey		
Types of fertlisers applied by the farmers	natural		Survey		
Yield gap	natural	DOA/HARTI	Fer. Secratariat & Survey (Actual Yield)		
Pre-harvest - Crop damages - lossess: extent, cause of damages.	natural		HARTI/Survey		
Post harvest lossess	natural		HARTI/Survey		
Existance of sustainable farming practices	natural		Survey		

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Annex 4. Continued

Name	Type of data	Existing source/who collect	Method of the data collection	Barriers	Solutions
Water use and management practices	natural	ID/MASL/DAD	Secondary data		
Type of farmings - monocuture or diversified	natural		Survey		
Average yield of different crops		DOA/DAD/DEA/ MASL	Survey		
Level of organic fertiliser use	natural		Survey		
Cultivation Extent	natural	DAD/DEA/ MASL/DOA/ HARTI	Survey		
Physical conditions					
Size of lands	physical	DAD/MASL/ LUPPD/DS	Survey		
Land status/tenureship	physical	DS/MASL	Survey		
Access to storage, transportation, packaging	physical		Survey		
Access to new techonology/ smart farming	physical	DOA/MASL/ DAD	Survey		
Level of technology (types of agriculture machineries used)	physical		Survey		
Social and human conditions					
Family conditions - number of dependence	social		Survey		
Gender contribution to farming practices	social		Survey		
Membership in various organisations	social		Survey		
Ownership to timber production forest - small woodlot programme	social	FD			
Access to extension services	social	DOA/DEA/ MASL/FD/CAD/ TSHDA	Survey		
Constraints for expansion	social		Survey		
Pontentials of future generations for farming	social		Survey		
Type of supports for agricultural extension and their frequency (note: identify the «name» of the extensionist)	social		Survey		
Charateristics of the farmers: part-time or full-time farmers by crops	human		Survey		

Annex 5. Off-farm and MSME baseline

Data name	Type of Data (spatial, tabular)	Existing source	Method of data collection	Barriers	Solutions
MSME Population	Number of entrepreneurs	NEDA			
	Number of MSMEs (size)	NEDA			
	Type of registration (incl. unregistered)	NEDA			
	Gender breakdown of legal ownership	NEDA			
Raw material	type of raw material		Focus group and initial survey for sampling One-on-one detailed survey	Cader numbers and Cader Capacity Respondents in most cases don't maintain financial, sales and other records.	Collaboration between government departments Capacitate government officer Invest in digital data collection tools and data bases
	quantity by type of raw materials				
	quality (grade) by type of raw materials				
	cost by type of raw materials				
	wastage				
	no. of suppliers				
	supplier contracts				
	type of suppliers				
	potential for supplier base expansion				
	material source location GPS				
	payment method				
	collection method				
	certifications (GAP, organic, FT ETC.)	DEA, DoA (GAP), NEDA			
	Financial assistance to supplier				

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Annex 5. Continued

Data name	Type of Data (spatial, tabular)	Existing source	Method of data collection	Barriers	Solutions
	technical assistance to supplier				
	CSR support for supplier				
	Gender breakdown of suppliers				
Operations	capacity by material type				
	technology used by material type				
	energy sources and consumption				
	no. of production employees				
	skill level of employees	Labour/Industry survey			
	employment type	Labour/Industry survey			
	Employment by gender, age, ethinicity, minorities	Labour/Industry survey			
	wastage				
	waste treatment				
	by products				
	Utilities	CEB, LECO, Water Board			
	CSR				
	Health and safety				
	Certifications and standards				
	Research and development				
	Quality controls				
	Pollution (air, water, noise, light, chemical/ biological)				
	Additives				
Marketing & sales	Type of product/ service	NEDA			
	Revenue by type of product/ service				

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Annex 5. Continued

Data name	Type of Data (spatial, tabular)	Existing source	Method of data collection	Barriers	Solutions
	Quantity by product/service				
	Export/in-direct export/ domestic market orientation of enterprise	NEDA			
	Geographical markts by type of product service				
	Quantity by geogrphical market by product				
	Revenue by geogrphical market by product				
	Marketing channels				
	Distribution channels by product/service				
	customer segment by product service				
	revenue by customer segment				
	Type of packaging materials				
	Labelling information				
	Advertising spend by channel				
	Advertising material spend				
	Return policy and service				
	Customer reviews and ratings				
	Branding strategy				
	marketing strategy				
Value Proposition	Select applicable Value Elements				
	Measure relevance of Value Elements				

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Annex 5. Continued

Data name	Type of Data (spatial, tabular)	Existing source	Method of data collection	Barriers	Solutions
Secondary	type of business registration	NEDA, DS, ROC			
	tax & statutory compliance	IRD, EPF, ETF, Department of Labour			
	credit terms				
	debtor terms				
	Labour law compliance				
	Financial records				
	Accounting packages				
	ERP packages				
	GBV record keeping				
	Gender responsive policies				
	Child labour				
	Capacity/gap for traceability implementation				
Distribution and Logistics					

Annex 6. Participant list

No.	Name	Institute
01	Prof Fergus Sinclair	ICRAF
02	Dr Ni'matul Khasanah	ICRAF
03	Dr Rachmat Mulia	ICRAF
04	Dr Beria Leimona	ICRAF
05	Mr Feri Johana	ICRAF
06	Dr Lakshman Rodrigo	ICRAF
07	Ms Imesha Waidyarathne	ICRAF
08	Ms Sithara Dissanayake	ICRAF
09	Mrs Chandika Ethugala	GKP/PMU
10	Mr Vikum Rajapakse	GKP/PMU
11	Mr Arjuna Senevirathne	GKP/PMU
12	Ms A.H.A.I. Upamali	GKP/PMU
13	Ms D.I.L. Ilangarathne	GKP/PMU
14	Ms K.M.K.H. Samaraweera	GKP/PMU
15	Dr Ananda Subasingha	GKP/PMU
16	Mr Mahendra Peris	GKP/PMU
17	Mr Ashoka Pushpakumara	CDA
18	Mr S. W. G.C. R. Kumara	CRI
19	Dr A. A. A. J. Atapattu	CRI
20	Ms Buddhika Lokubalasooriya	DAD
21	Ms V.Thavishnie	DAD
22	Ms Thusari Liyanage	DEA
23	Dr Sampath Induruwa	DEA
24	Mr Isuru Alawatte	DFC
25	Mr D A Danial	Elkaduwa
26	Mr Priyantha Brahmana	FD
27	Mr Gayan Thisera	FD
28	Dr V. D. Nirusha Ayoni	GA Kandy
29	Ms Uthpala Jayasinghe	HARTI
30	Ms D.S. Chathurika	HARTI
31	Mr L.M.W. Rathnasiri	ID
32	Mr W.C.N. Wickramasinghe	ID

No.	Name	Institute
33	Mr P Anurudda Kumara	MASL
34	Mr D.S.K.Pitigala	MASL
35	Mr Dilanka P Ekanayaka	MASL
36	Mr H.K.M.Hettiarachchi	MASL
37	Mr R.A.R.L.Ranasinghe	MASL
38	Mr Chandana Edirisooriya	MCB
39	Mr R.H.S.S.Fernando	MCB
40	Mr Vimukthi Fernando	MCB
41	Mr Leel Randeni	MOE
42	Mr Dasun Hewapathirana	MOE
43	Ms Nirosha Kumari	MOE
44	Ms Harshika Kulasekara	NEDA
45	Ms Praveena Balesh	NEDA
46	Ms Nadeesha Sooriyaarachchi	NRMC
47	Mr A.P.G.D.N.Weerawardhana	NRMC
48	Mr S.P. Withanage	RDD
49	Dr Enoka Munasinghe	RRI
50	Mr Mangala Dayarathna	SLSPC
51	Mr I K Thennakoon	SLSPC
52	Dr J D Kottawaarachchi	TRI
53	Mr Lalith Kumara	TSHDA
54	Ms Krishanthi Niluka Gunawardena	TSHDA
55	Dr Jairo A. Villamil-Diaz	UNIDO
56	Prof Jeevika Weerahewa	UOP
57	Ms Sonali Pandithasekara	Serendipol
58	Ms Shashika Kaluwahewa	Jetwings
59	Mr Vihangun Ariyaratne	GoodLife X
60	Prof Prashanthi Gunawardena	USJP
61	Mr Adeesha Perera	Union Bank
62	Mr Vidura Sonnadara	CEB
63	Mr Chandana Wanigasena	DFCC

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