



**HEALTHY LANDSCAPES:
Managing Agricultural Landscapes in
Socio-ecologically Sensitive Areas to Promote Food
Security, Well-being and Ecosystem Health
GEF ID.: 9409**

Mid-term Review (MTR)
FINAL REPORT

**Submitted by:
Julian F. Gonsalves, PhD**

16 December 2022



This report was prepared by an independent consultant evaluator and is a product of the Evaluation Office of UN Environment. The findings and conclusions expressed herein do not necessarily reflect the views of Member States or the UN Environment Programme Senior Management.

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Julian Gonsalves is a specialist in regenerative agriculture, climate resilient agriculture, food systems, and nutrition-sensitive agriculture and associated social processes needed for scaling and sustaining programs. He is currently the Senior Program Adviser of the International Institute of Rural Reconstruction (IIRR) and Senior Fellow at the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). He received his PhD from the Cornell University and his master's degree from Michigan State University. He has done external reviews for UNEP, FAO, SDC, IFAD, IDRC, and several other organizations. Julian served on the Scientific Advisory Committee for the IDRC CIFSRF. He is a UNEP Global 500 awardee for his work on environment and agriculture. He has been a strong proponent of regenerative agriculture, nutrition sensitive agriculture and agroecological approaches since the 1990s. He helped develop a program for training and action research initiative in regenerative agriculture in six countries. He has reviewed regional initiatives in Community Based Natural Resources Management of IDRC and the IUCN Mangroves for the Future initiative in four countries. He reviewed the Ecosystems for Life Initiative in India and Bangladesh. He also assisted the CGIAR CCAFS in developing a program for Southeast Asia on climate-smart villages and climate-smart agriculture. Until recently, he served as team leader for a sub-project under the ADB Biodiversity Corridor Project in Cambodia. Currently, he serves as project leader for a Darwin Initiative-funded project on biodiversity conservation in coastal areas in Quezon Province, Philippines. He has produced over 30 publications over his career.

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ABBREVIATIONS

| | |
|-------|------------------------------------------------------------|
| ABC | Alliance of Bioversity International and CIAT |
| BaCH | Biodiversity and Community Health |
| BACC | Biodiversity for Adaptation to Climate Change |
| BFN | Biodiversity for Food and Nutrition |
| CEA | Central Environment Authority |
| CEM | Cascade Ecology and Management |
| CGIAR | Consultative Group for International Agricultural Research |
| DAD | Department of Agrarian Development |
| DOA | Department of Agriculture |
| DOI | Department of Irrigation |
| DWC | Department of Wildlife Conservation |
| FD | Forest Department |
| FRESH | Fruit and Vegetables for Sustainable Healthy Diets |
| HLP | Healthy Landscapes Project |
| LUPPD | Land Use Policy Planning Department |
| MTR | Mid-term Review |
| NAICC | National Agriculture Information and Communication Centre |
| NAQDA | National Aquaculture Development Center |
| NRMC | Natural Resources Management Centre |
| PDHS | Provincial Department of Health Services |
| PDOA | Provincial Department of Agriculture |
| PGRC | Plant Genetic Resources Centre |
| PID | Provincial Irrigation Department |
| SACEP | South Asia Cooperative Environment Programme |
| SLTDA | Sri Lanka Tourism Development Authority |
| VTCS | Village Tank Cascade System |
| WRB | Water Resources Board |

PROJECT IDENTIFICATION TABLE

An updated version of the Project Identification Table (i.e., the table at the beginning of each Project Implementation Review Report).

| | | | |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Identification Table | | GEF ID.: 9409 | Umoja no.: GFL-11207-14AC0003-SB-008095.05 |
| Project Title | | <i>Healthy Landscapes: Managing Agricultural Landscapes in Socio-ecologically Sensitive Areas to Promote Food Security, Well-being and Ecosystem Health</i> | |
| Duration months | <i>Planned</i> | 36 | |
| | <i>Extension(s)</i> | N/A | N/A |
| Division(s) Implementing the project | UN Environment Programme Ecosystems Division GEF Biodiversity and Land Degradation Unit Biodiversity and Land Branch | | |
| Executing Agency(ies) | | <i>Bioversity International</i> | |
| Names of Other Project Partners | | <i>Ministry of Mahaweli Development and Environment</i> | |
| | | <i>Mahaweli Authority of Sri Lanka</i> | |
| | | <i>Ministry of Agriculture, Department of Agriculture</i> | |
| | | <i>South Asia Co-operative Environment Programme (SACEP)</i> | |
| Project Type | | <i>Medium Size Project</i> | |
| Project Scope | | <i>National</i> | |
| Region | | <i>Asia Pacific</i> | |
| Countries | | <i>Sri Lanka</i> | |
| Programme of Work | | <i>PoW Biennium 2020-2021 Sub-programme 3 - Healthy and productive ecosystems</i> | |
| GEF Focal Area(s) | | <i>Multi Focal Areas</i> | |
| UNSDCF / UNDAF linkages | | <i>Pillar 4, Environmental Sustainability, Climate Change and Disaster Risk Reduction</i> | |
| Link to relevant SDG target(s) and SDG indicator(s) | | <i>SDG 2,3,5,6,15</i> | |
| GEF financing amount | | <i>US\$ 2,000,000</i> | |
| Co-financing amount | | <i>US\$ 9,047,865</i> | |
| Date of CEO Endorsement | | <i>30 April 2018</i> | |
| Start of Implementation | | <i>1 April 2019</i> | |
| Date of first disbursement | | <i>3 September 2019</i> | |
| Total disbursement as of 30 June 2021 | | <i>300,000</i> | |
| Total expenditure as of 30 June 2021 | | <i>275,464</i> | |
| Mid-Term Review Date | | <i>June 2022</i> | |

| | | |
|-----------------------------------|----------------|----------------------------------------------------------------------------------|
| Completion Date | <i>Planned</i> | <i>31 March 2022</i> |
| | <i>Revised</i> | <i>Proposed no cost extension</i> 24 Months (subject to UNEP approval) |
| Expected Terminal Evaluation Date | | |
| Expected Financial Closure Date | | |

EXECUTIVE SUMMARY

1 The Healthy Landscapes Project (HLP) was planned in order to bring attention to the need for showcasing management strategies for strengthening the restoration and sustainable management of selected Village Tank Cascade Systems (VTCS) in the dry landscape of Anuradhapura District. There was an implicit plan for the pilot models to be used to influence the scaling to other cascade landscapes. It also strove to draw the attention of policy makers, line agencies, academic institutions, and community stakeholders to the importance of healthy cascade ecosystems for human health and wellbeing, thus going beyond the narrow engineered centered approaches to tank restoration.

2 In spite of the best intentions of the project designers and the implementing agencies, the project was challenged by a set of delays, mostly beyond the control of project management. This included changing political landscapes, security issues following the bomb attack, changes in rules on foreign-funded projects, and the COVID pandemic. There were other delays because BI did not have national presence in Sri Lanka. However, during this period and despite the greatly reduced mobility (from COVID-19 and the fuel crisis), the Healthy Landscapes Project partners were able to engage in a wide range of formative and scholarly studies (multidisciplinary and many participatory in nature) labelled as baseline studies. These studies achieved more than baseline studies normally do, most likely because they were entrusted to highly experienced academics and researchers. Thus, even though at the start of 2022 very little pilot site level “showcasing” of restoration was in place, the Healthy Landscapes Project had generated a wide range of studies which in themselves already serve as legacies of the Healthy Landscapes Project. A milestone event, the Cascade Ecology and Management Conference (CEM 2021) was undertaken in partnership with other institutions and featured a large number of the baseline study results. This outstanding achievement, the scholarly studies on various dimensions of cascade ecosystems, has already created an awareness of the value of healthy ecosystems.

3 Though the actual initiation of tank level restoration activities (at pilot site level) had not been initiated even early in 2022 (due to the combined effects of the pandemic, and the political and socioeconomic crisis) preparatory studies, cost estimates, and proposals by five line agencies had been completed and were in place by early 2022. Major restoration activities were launched by the Department of Agrarian Development in two of the four proposed restoration tanks sites, immediately after the Mid-Term Review visit and subsequent Project Steering Committee debriefing. The restoration efforts in the other two tanks will be initiated in early 2023. Given the strategic nature of the HLP inputs to these restoration efforts (as described to the Mid-Term Review in September), it is expected that by the next cropping season over 1,000 acres of crop lands will have already benefited.

4 Biodiversity dimensions were less pronounced in HLP as of the MTR. The need for enhancing the biodiversity-based options was highlighted with all the line agencies and a recommendation for targeting clusters of farmers was made, so a few hundred farmers could benefit in 2022 and more in 2023. The Provincial Department of Agriculture and the Forest Department have committed to making up for lost time. Fortunately, the Anuradhapura district has a bimodal rainfall pattern (with one season starting in September/October this year) allowing for two cropping seasons.

5 A strategic set of activities for the HLP relates to knowledge management, policy influencing activities, and training and education activities. These were retained and, in some cases, enhanced. In order to improve the chances for delivering with quality and within a short timeframe, some consolidation and streamlining of a large number of activities was proposed and agreed on. The knowledge management cluster of activities is expected to deliver outputs which will influence policy and action, while serving to inform future projects related to holistic development of these water harvesting infrastructures in the Anuradhapura district and in the north central province of Sri Lanka.

6 In consultation with line agency partners and the Project Management Unit, activities (and outputs) within the results framework and work plan were revised/modified/dropped and agreed upon. During the entire mission, a sense of urgency for dovetailing and focusing on fewer priority activities was conveyed. Proposed revised versions of both the Results Framework and Work Plan can be found in the Annex 1 and 2. A strong sense of urgency to fast-track approvals and expedite fund disbursement is needed. It is proposed that the Project Management Unit be given more discretionary powers and access to funding to allow it to respond quickly in order to fast track field level needs. The line agency and university partners are highly (technically) competent and are ready to do their bit to deliver rapidly on the implementation. The challenge for the HLP is to showcase restoration on the ground and the hope to build awareness and an enabling environment (amongst policy makers, academics and researchers, and government line agencies) for healthy cascade ecosystems can still be assured, in spite of numerous early setbacks. What the HLP is endowed with is a particularly rich social capital at community levels and strong existing relationships between implementing line agencies, universities, the Project Management Unit, and the National Project Manager. For this reason, there is optimism the HLP will be able to achieve the outputs and outcomes that the original designers had set for HLP. A no-cost extension is recommended. In the reviewer's view, this is justified and crucial for HLP to deliver the results it previously envisaged for cascades in Anuradhapura District and leave a legacy for local governments.

I. PROJECT OVERVIEW

7 The Healthy Landscapes Project (HLP) is located in the Anuradhapura District within the dry sub-humid north-central province of Sri Lanka. The landscape within the district is dotted by small and medium ‘tanks’, ancient devices for harvesting runoff and direct rain and storing rainwater. Extra runoff from the upper tanks feed into lower tanks thus serving as a recharging mechanism. The tanks are interconnected, sometimes in series or in parallel. Tanks are fed by direct rain and from run off from catchment areas. Though shallow, the tanks are often spread out over a wider area than the area they irrigate. Tanks which are in good condition can provide water for two rice crops in a year and sometimes a third “dry” crop. These water-harvesting and storage devices also serve to recharge ground water which, in turn, is tapped by farmers who construct wells (drilled or open wells) for year-round supplemental irrigation. The bimodal rainfall pattern is particularly important to ensure enhanced water harvesting and recharge. These tanks have served many generations of farmers with water, not only for farming but also for domestic use and meeting the water needs of cattle and small livestock. These tanks also provide water to wildlife (including elephants) while also serving flocks of migratory birds. Healthy ecosystems result from well-maintained tanks and catchment areas. Their role in conserving biodiversity (aquatic flora and fauna, agriculture, and forest biodiversity) is increasingly valued.

8 Over the years, siltation, changing land use systems, and the weakened (community) governance of these tank systems has resulted in tanks falling into disuse or with greatly reduced capacities for irrigation. Experts and farmers agree that these ancient systems were technically sophisticated, and they recognize that in the future these devices can serve as anticipatory climate adaptation measures. However, over the years, many of these tanks have become degraded and some have even been abandoned. Other tanks now have a greatly reduced capacity for meeting the needs of farmers and wildlife. Indeed, these Village Tank Cascade Systems (VTCS) provide multiple ecosystem services and benefits. There is a need to restore these systems keeping in mind the ecological complexity and the need for long term sustainability. The climate change worries of government and farmers is real, and efforts are needed to anticipate the needs for water in the future. The HLP set out to help support the generation of improved ecosystem and eco-health outcomes from VTCS systems, including through the demonstration of sustainable land use and management of cascade tanks. A climate change adaptation co-benefit will also result from this effort.

9 The Healthy Landscapes Project was designed to promote food security, well-being, and ecosystem health in socio-ecologically sensitive areas of the Anuradhapura district in Sri Lanka’s dry zone. The mainstreaming of biodiversity in integrated land management and restoration of tanks within cascades systems is an important feature in this approach. The project also set itself to help forge partnerships at different levels in an effort to bring a broad-based understanding and awareness of the value of healthy cascade systems. Partnership and convergence of services were planned at pilot site level. Pilot sites were to serve as proof of concept of the value of partnership and collaborative approaches that highlight the linking of biodiversity-based objectives with tank restoration and conservation. Capacity development and knowledge management components were designed to build an awareness of sustainable land management and associated ecological and biodiversity dimensions. Efforts to influence university and school curricula are planned. An ambitious communications support effort includes generation of state-of-the-arts knowledge books and publications.

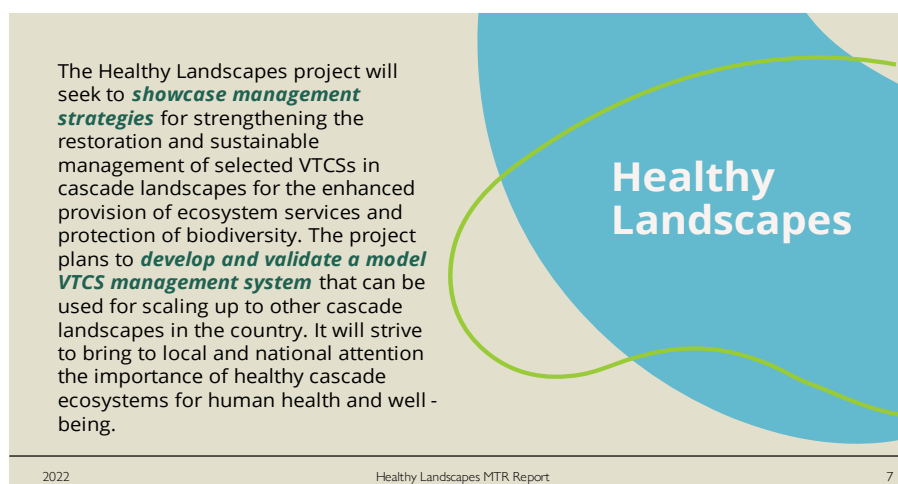


Figure 1. Project description.

10 The HLP is implemented by the Ministry of Environment of Sri Lanka in partnership with the Alliance of Bioversity International and CIAT. The Alliance is responsible for technical guidance, management, and use of GEF funds. To facilitate administrative processes with the Ministry, the project selected a service provider, the South Asia Co-operative Environment Programme (SACEP), to provide the necessary administrative and financial support to liaise with relevant government agencies and to provide local financial oversight and management. The project has a Project Management Unit (PMU) with a small team led by the National Project Manager (NPM). SACEP/PMU serves as a secretariat to the Project Steering Committee (PSC). PSC includes BI, UNEP, and MoE. A PSC meets on a regular basis, providing overall oversight. A Technical Advisory Committee (TAC) reviews progress and provides strategic monitoring and guidance as needed. In the future, the TAC can also visit target sites to draw lessons to be fed back to the PSC and to project management.

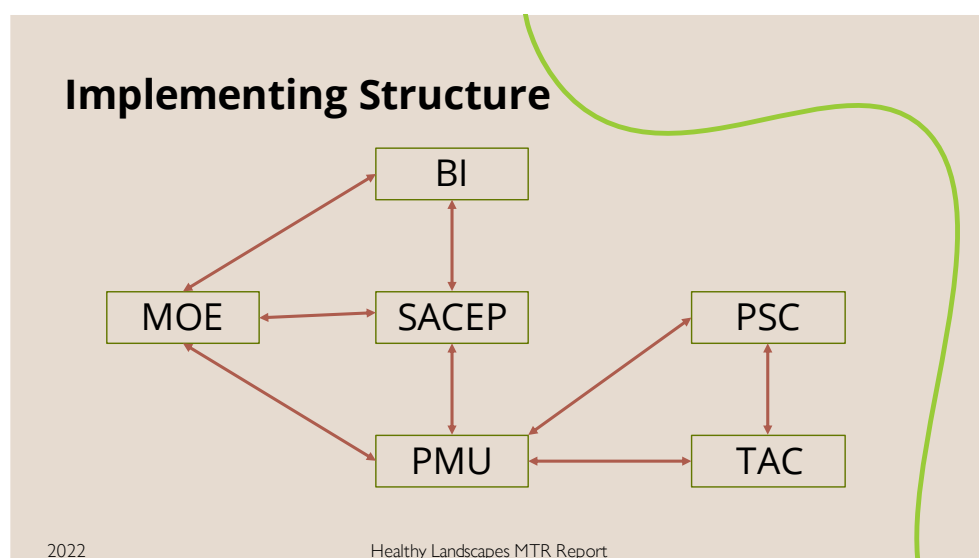


Figure 2. Implementing structure.

11 Project implementation was delayed for two years due to government regulations with regards to fund management and disbursement issues, the COVID-19 pandemic, the political

upheaval, the fuel crisis, and reduced mobility of partners. The HLP was launched with the signing of an agreement with a service provider (SACEP) in September 2021. With the hiring of the NPM team and the establishment of field offices, actual implementation only really started in February 2022. At that time, the country was still recovering from the impacts of the disruption caused by the pandemic while beginning to grapple with the fuel and economic crisis which still lingers. The TAC was only recently established in mid-2022.

12 With the project officially having ended in 31 March 2022 a no-cost extension (NCE) is recommended. The Mid-Term Review consultant is cautiously optimistic that there is a reasonable chance that outputs/ outcomes can be delivered (including at pilot scale level) in that period if pilot sites are reduced to only two cascades and the MTR recommendations for work plan adjustments are followed (refer to the Annexes 1 and 2 for the current and proposed revised plans and frameworks).

METHODS

13 A summary of the objectives of the MTR is presented below (for more details on the Terms of Reference, please refer to the Annex). The primary purpose of the review was to evaluate progress and propose fine tuning of work plans and the results framework. Further, the MTR included:

- Evaluation of progress to date using the indicators as a benchmark for project progress,
- Rating project impacts/performance based on standardized criteria,
- Possible fine-tuning of work plans for the second half of the project,
- Improving project approaches and optimizing implementation arrangements, based on a review of progress on execution as well as the achievement of project indicators as specified in the Project Document.

14 This MTR was only commissioned in mid-2022 (beyond the planned technical completion date), delayed considerably because of the many reasons mentioned earlier. The initial desk work involved reviewing the baseline studies and the Cascade Ecology and Management (CEM2021) conference proceedings. These two high quality outputs provided the reviewer with the background and context for the project. The Project Implementation Report for June 2021 to July 2022 was another important information source. The reviewer had to deal with the reality that most of the planned activities – with the exception of the baseline – had not materialized even by mid-2022. Sub-proposals were prepared by partners and presented to the PMU mid-2022 when the pandemic was “controlled” and mobility resumed. However, that was also the peak of the political and economic upheavals in Sri Lanka, all of which impacted negatively on project progress. The HLP was challenged by an extraordinary set of factors just prior to the conduct of the MTR. The MTR benefitted greatly from the fact that the partners had prepared plans and estimates, that were presented for comments.

15 With the end of project originally set for 31 March 2022 (1 April 2019 is considered as the project start-up date), and with nearly no pilot-site level outcomes, and most of the activities not initiated, the reviewer had to adopt a “trouble shooting” approach. The reviewer proposed reducing the scope of the earlier plans (outputs and activities) while retaining the original components and overall outcomes. The review thus took on a consultative approach with project stakeholders and the project management unit. At the PMU level, consultations with partners were undertaken to engage them in a critical and realistic review of previously planned activities. Relying

on this participatory process, the reviewer, the project partners and the project manager came up with a revised workplan and a results framework (refer to Annex 1 and 2). Some activities were dropped, others merged and revised. Only the most important ones were retained. In exceptionally few cases, new activities were added. Final decisions on the work plan were made during the in-country dialogue with partners themselves, thereby greatly enhancing the chances of arriving at a realistic and doable revised work plan. This approach of building ownership while also instilling a sense of urgency amongst partners was deemed crucial. Many proposals that were previously submitted but were awaiting internal project approval, were reviewed jointly with stakeholders, and recommended for urgent implementation.

16 Towards the end of the MTR visit to Sri Lanka, the reviewer met the members of the Project Steering Committee (PSC), the Technical Advisory Committee, and the PMU, in a face-to-face event. Preliminary observations and recommendations, including in relation to the NCE, were presented. The urgency to fast-track pilot site activities, to strengthen ecology and biodiversity elements, and prioritize knowledge management activities was conveyed. The reviewer took on a position of cautious optimism, believing that the project could make some significant contributions even in the remaining period of just over a year. The last four months of 2022 provide that narrow window of opportunity for delivering on certain season-bound activities planned for October to December 2022 (plans and proposals for these were previously submitted). A recommendation for reducing the number of pilot sites from five to two sites was well received by stakeholders and management

17 Once the rationale for streamlining activities was presented to partners, consensus was reached. A **proposed** revised work plan and results framework can be found in the Annexes and are submitted via this MTR report for final review at different levels (Alliance of Bioversity International and CIAT (ABC), UN Environment Programme, and NSC).

INTRODUCTION TO THE PROJECT

Short Project Description

18 The HLP sets out to strengthen the restoration and sustainable management of selected VTCS in Sri Lanka for the purposes of enhancing the provision of ecosystem services and the protection of biodiversity. By promoting the greater integration and use of agrobiodiversity as well as associated ecological knowledge and sustainable agricultural practices in pilot sites, the project sets out to improve sustainable management in cascade landscapes. It also aims to address some of the human health-related challenges that characterize the dry zone of Sri Lanka, while strengthening food and nutrition security, adaptability, and resilience in target communities. Furthermore, the project was designed to bring local and national attention to the importance of healthy cascade ecosystems for human health and well-being. The project is being executed locally by the SACEP, in collaboration with the Ministry of Environment, and the Ministry of Agriculture. Overall supervision is provided by the Alliance of Bioversity International and CIAT

19 The project includes the following components:

Component 1: *Implementation of biodiversity-based options that improve sustainable landscape management in socio-ecological sensitive areas.* This component supports the development, validation and scaling up of community-based practices and models for integrating agrobiodiversity and ecosystem services through alternative agricultural production pathways for more resilient village tank cascade systems.

Component 2: *Strengthened institutions, policies, and integrated landscape planning of village tank cascade systems in socio-ecological sensitive areas.* This Component intends to build a more effective enabling environment for cross-sectoral coordination and development planning to restore and manage multi-functional farm and agricultural landscapes, sustainable land management and local healthy food systems, thus reducing risks and enhancing human health.

Component 3: *Partnerships, awareness raising and capacity building for better integrated landscape management in support of improved ecosystem services and eco-health outcomes.* This component contributes to assessing and mapping knowledge gaps on linkages between biodiversity, agriculture, and human health, to understand landscape processes and to develop and test improved resource management practices for VTCS based on the concept of cascade ecology especially for universities and schools but also extension services and policy makers.

Component 4. *Knowledge, Information Management, and Monitoring and evaluation.* This component aims to build multi sectoral knowledge sharing platforms and enhanced integrated knowledge management systems that include detailed information on sustainable practices and stronger statistical data on ecosystem degradation and its health impacts.

Component 5. *Project Management.* Project administration and coordination, project budgeting and accounting, establishment of relevant committees, and work planning.

PROJECT SITES

20 During the Project Preparation Grant (PPG) phase (see *Healthy Landscapes: Managing Agricultural Landscapes in Socio-ecologically Sensitive Areas to Promote Food Security, Well-being and Ecosystem Health*, <https://www.thegef.org/projects-operations/projects/9409>), the project design team reconsidered the proposed project sites and decided, based on the available resources and reduced three-year timeframe, that the most effective strategy was to focus activities and interventions in VTCS in the dry zone of the country. Based on consultations at national workshops (specific and extended criteria were proposed, discussed and after field visits by the project design team to candidate VTCS), the HLP project proposed working in the following two VTCS including the establishment of five model eco-health villages (from PPG phase reports).

- Mahakanumulla – Thirappane – Ulagalle triple Nachchaduwa VTCS complex
- Palugaswewa – Bellankadawala double Horiwila VTCS complex

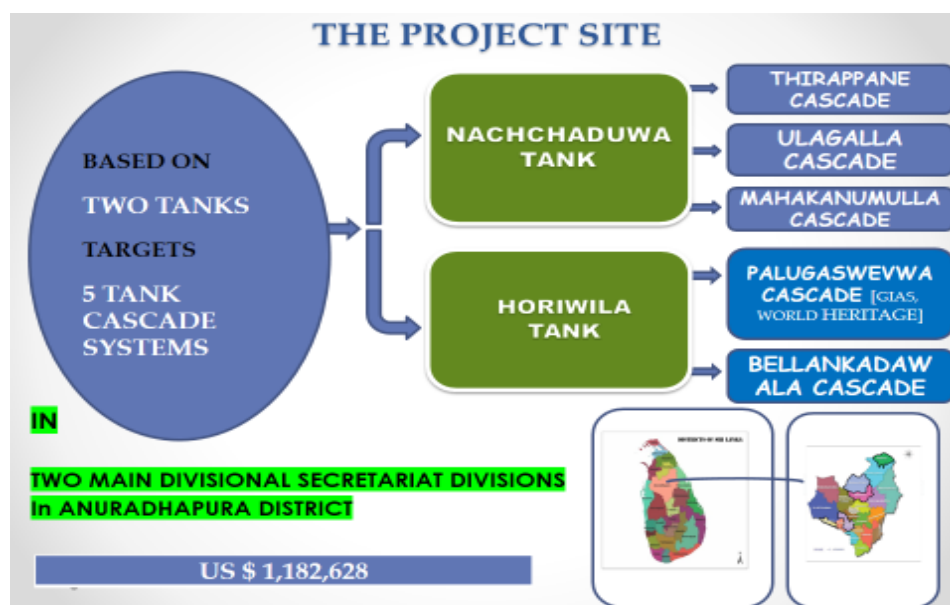


Figure 3. Target project cascade systems and tanks.

II. REVIEW FINDINGS

21 Due to several confounding factors, which resulted in the delay in project start up (many were factors over which the PMU had no control over as referred to earlier), some of the usual evaluation criteria could not be strictly applied. However, the matrix has been filled and can be found at the end of this report. Meanwhile, the following list of review findings will highlight the continued strategic relevance of the HLP. This report draws attention to factors affecting performance and effectiveness in delivering outputs and achievement of outcomes. It brings attention to financial management and sustainability dimensions.

22 **Finding 1.** After considerable implementation delays in the first three years, and following the signing of project agreements, addressing government regulations regarding fund transfers, the COVID-19 pandemic, economy, etc., the HLP resumed implementation with the signing of an agreement with a service provider (SACEP) in September 2021. With the hiring of the NPM team, and the establishment of field offices, actual implementation started in February 2022. At that time, the country was still recovering from the impacts of the disruption caused by the pandemic and the political and economic crisis (including fuel shortages). The TAC was only established in mid-2022. The MTR is cautiously optimistic that that the revised outputs/outcomes can be delivered at pilot scale level with a no-cost extension, if pilot sites are reduced to two, from the five originally proposed. Project management (SACEP and PMU) would need to be responsive, efficient and prompt in approval of partner proposals and in disbursement of funds. A sense of urgency would be needed at all levels to help HLP succeed in meeting its objectives.

23 **Finding 2.** The mapping of socio-ecological and biophysical properties has been completed (Output 1.1). An outstanding achievement of the project has been completing these high-quality studies on a range of cascade ecosystems' dimensions. The fact that these comprehensive and substantive baseline studies were done during the pandemic is remarkable and is to be commended. The co-organizing and support of the CEM conference has also been a highlight of the early HLP achievements. The objective of building awareness of the value of healthy ecosystems and cascade ecologies is thus already being well served. A bigger focus on knowledge management activities, the establishment of a community of practice (COP) for cascade researchers and academics, the engagement of mass media in project-support communications, and the end-of-project conference/symposium planned for the last year (Component 3) are major advocacy, information and public awareness efforts. A broad awareness and an enabling environment (amongst policy makers, academics and researchers and government line agencies) for healthy cascade ecosystems is likely to emerge as the legacy of HLP in Sri Lanka.

24 **Finding 3.** A major and most serious concern noted by the MTR has been the lack of project supported action at the target cascade and pilot-site level. Component 1 committed to the implementation and adoption of sustainable land management approaches (Outcome 1). The 5,000 hectares committed for mid-term target and 10,000 hectares by end of project in 2023 (with five sustainable eco-health models) is not achievable even under a NCE. The HLP team should therefore greatly reduce the original number of cascade sites and eco-health pilot models and focus on two pilot cascades and selected tank sites therein. These will serve as HLP's legacies (Output 1.1.4 and Output 1.3 and 1.4).

25 **Finding 4.** During the community needs assessments done by HLP in the two cascade complexes, 32 tanks were identified with boundary demarcation needs. Sixteen were prioritized based on visits to the sites. Demarcations are planned. These are important to protect catchment areas from being taken over for production agriculture (e.g., corn), making demarcation a high

priority for preserving ecosystem services. These tasks are already being discussed by the NPM with the Surveyor General. Typically, two to three months are needed for the demarcation of each tank, with two teams deployed for the required survey work. The process for demarcation of catchment areas needs to be documented, given the implication and relevance of demarcation for conserving wider tank ecosystem services.

26 **Finding 5.** During the last months of the pandemic and early in 2022, community needs assessments were undertaken to identify 32 tanks with needs for demarcation (discussed above) and restoration. Three of these tanks were chosen for priority restoration action. The reviewer visited one of these tanks – the Tumbikulama tank – to get a firsthand understanding of the issues and what is involved. The site visit involved a 1.5 hour walk across what used to be the tank bed, before it dried up (a bund broke draining out the tank). The gullies (shown in the following photos) needed to be fixed and various irrigation sluices repaired. With the bunds repaired, the tank will be flooded again (rainwater will once again collect) and over 300 acres of rice lands will be restored within just a year. Additional 200 acres will become available for crops requiring less water (for legumes and corn). The returns on investment are likely to be high, given that such large areas will be brought back into cultivation with relatively small investments. The community which abandoned the land for 20 years returned when they were informed about HLP's plans. They met with the PMU team and the reviewer. The work started soon after the MTR visit and is due to be completed by December 2022

27 **Finding 6.** The HLP has a very large number of planned activities (including some observed overlap and duplication between some outputs and activities) around community awareness raising and training. Output 1.2 for example, includes a *very wide* range of training and awareness raising workshops most of which had not been initiated as of the time of the MTR. Many of the line agencies have separate/different plans for awareness and training at community level. This could be a burden to local communities if all these agencies were each to implement their own awareness building activities. Quality could also suffer if efforts are rushed (for the sole purpose of delivering on activities). It would be wise to not pursue *all* the previously planned awareness and training activities. Activities were reviewed considering the limited, available timeframe, resources and the need to shift to delivering tangible change at cascade level. Some of the activities in Component 1 can be integrated under Component 2 and others under Component 3. The knowledge product (1.1.5) outputs are best delivered under Component 3. Thus, HLP can have a unified approach (with clarity on focal/responsible institutions) for implementing awareness building, capacity development, and knowledge management (details are provided in the proposed revised work plan in Annex 2).



Figure 4. This is the kind of degradation that is being prioritized by the HLP. Two sites are being targeted for restoration in October 2022 before the onset of heavy rains. These are the *Thumbikulama* and *Rabawewa* tanks in the *Bellankadawala* cascade system.

28 **Finding 7.** The HLP set out to prominently demonstrate (among other objectives) sustainable land management activities with biodiversity outcomes. The potential of such options in restoration and conservation of cascade systems is well known. The project emphasizes healthy ecosystems and associated services. Biodiversity-based agroecological options for sustainable land management and ecosystems enhancement are crucial, and often central for project success (Output 1.4). Thus far however, Output 1.4 appears somewhat *neglected* and has not received attention. However, it is not too late and there are several entry points to bring in the agrobiodiversity elements into the two pilot sites. This can include the promotion of home gardens, family farms (especially the rainfed uplands), and in areas around the restored tanks. HLP can build on the legacy of previously UNEP/Global Environment Facility (GEF) funded projects (BFN and BAAC) thus reducing the need for more studies and assessments. The baseline studies also point to the opportunities for work on local underutilized crops, especially drought tolerant, and nutritionally relevant agrobiodiversity. This includes cereal crops (finger millet and upland rice), legumes (cowpea, soyabean, green and black bean and groundnut) and a wide range of fruit and medicinal trees. These cultivars have evolved over the years, many demonstrating optimum performance *under low external input conditions*, suggesting that they could have a role in the current situation, where fertilizer supply is a constraint. The Provincial Department of Agriculture (PDOA) is well sensitized and knowledgeable about using legumes to restore soil fertility in post-rice seasons. Seeds can be sourced from provincial and district markets with similar agro-ecologies as the HLP pilot sites. The strong technical competencies of the PDOA were evident when their team presented plans to the MTR (at that time, they were awaiting approval). The PDOA and the

Department of Agrarian Development (DAD) are staffed by technically competent individuals, have sound and well thought out plans. What is needed is rapid responses and approvals of proposals from the project management and administration at various levels. Delivering on Output 1.3, 1.4, and 1.5.5 should be a very high priority for the PMU, the PDOA, and DAD. Rapid responses at these levels could fast track many of the pending but well thought out proposals of line agencies

29 **Finding 8.** Progress towards Component 2 on strengthened institutions, policies and integrated planning of VTCS, a primary support component for delivering HLP's outcomes, was limited (refer to Project Implementation Report, July 2022). Component 2 was critically reviewed during the MTR, keeping in mind the available timeframe. Components 3 and 4 are invariably linked to Component 2. Output 2.1 on capacity building and awareness raising should be merged with 3.2 which also has a support function/role (similar to Output 1.2 which should be merged with 3.2).

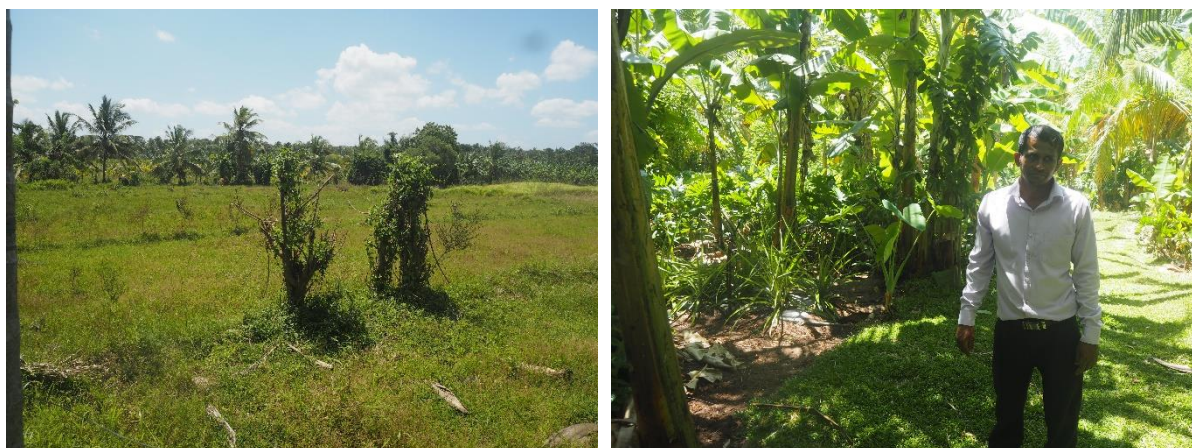


Figure 5. This farmer converted a piece of land (see photo of adjoining neighbor's plot) into a lush, biodiverse, and multi-storied cropping system/farm in less than three years. Over twenty crops are grown, with labor requirements spread out, and risks reduced. Income flows are spread out through the year. This farm is less than a hectare and serves as an example of what is feasible in the dry zone with open-well irrigation.

30 **Finding 9.** The MTR was informed that Output 2.4.4 on *Guidelines for integrated landscape management* have been completed by the Land Use Policy Planning Department (LUPPD). Similarly, LUPPD is halfway through with 1.4.4 analyses of data and modelling of conservation and development scenarios. Though the MTR was not able to access a copy of these guidelines, from what was presented during the review, a watershed management orientation was highlighted. It is likely that these guidelines do not adequately factor in the broader cascade ecosystem and eco-health dimensions. The element of cascade ecology was supposed to characterize the HLP, distinguishing it from past effort on tanks. It would therefore be essential for LUPPD to ensure that its integrated landscape management guidelines include cascade ecology and socioecological sensitive elements (Output 2.4). In addition, and in order to address cascade ecologies, ecosystems, and biodiversity, a recommendation is being made for the Natural Resources Management Center (NRMC) of the Dept of Agriculture in Peradeniya to prepare a synthesis document based on lessons from past and current projects on VTCS. Such a synthesis document will have to be commissioned to experts with interdisciplinary orientation, hence, the suggestion for the NRMC to lead this effort.

31 **Finding 10.** The dimension of climate change and the links with biodiversity, water, and food/livelihoods need to be given more attention. This was discussed with Dr. Sujith Ratnayake and his colleagues (Sustainability 2022, <https://doi.org/10.3390/su141610180>). The VTCS system is

to be viewed as a significant climate adaptation measure, indeed an anticipatory adaptation measure. Climate change needs to be more directly featured in HLP work at pilot site level, in its policy briefs and synthesis studies, state of knowledge books, and planned source books. The VTCS was designed by early Sri Lankans to address drought. It is easy to understand how the VTCS can play a major role in addressing future climate variability resulting from climate change.

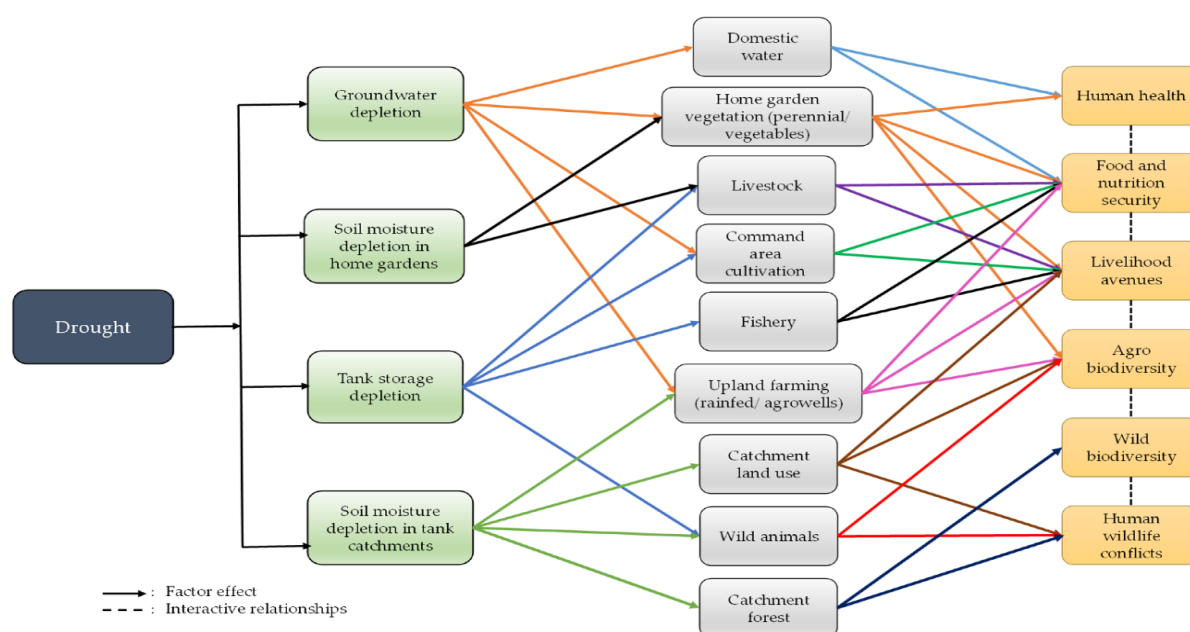


Figure 6. Climate-Biodiversity-Food and Livelihood Nexus in the Mahakanumulla VTCS.

Source: Ratnayake, S.S.; Kumar, L.; Dharmasena, P.B.; Kadupitiya, H.K.; Kariyawasam, C.S.; Hunter, D. Sustainability of Village Tank Cascade Systems of Sri Lanka: Exploring Cascade Anatomy and Socio-Ecological Nexus for Ecological Restoration Planning. *Challenges* **2021**, *12*, 24. <https://doi.org/10.3390/challe12020024>

Finding 11. The HLP has committed to undertaking a very wide range of project support communications. However, at MTR stage, *none* have been initiated. A determined effort is needed to critically assess what is both achievable and considered a priority. If hard decisions are not made, the project risks overloading partners. There is need to cluster the most important (and realistically achievable) products into a few major activities/deliverables, e.g., curriculum, policy briefs, guidelines, and community education. Responsibility for training and education, and knowledge management is best managed by the project's two university partners, leaving other agencies to focus on implementation. These issues were raised and discussed resulting in a favorable and supportive response from the Project Manager and the PMU. Changes are now reflected in the proposed revised work plan which had dovetailed and merged many activities. Knowledge management objectives were not affected and, in fact, might have been strengthened as a result of the agreement to focus and build on past work on cascade ecology thus using a knowledge utilization approach to generating new information and advocacy products.

Finding 12. The HLP has many implementing partners which are expecting to coordinate, collaborate, and partner at cascade level with many in a support role. The representation of farmer organizations, cooperatives, and local institutions at the frontlines is weak with likely implications for achieving scale in pilot sites. Decision making would be greatly facilitated if there was just one single focal point for each output instead of several (refer to Annex for information on Focal and Support Institutions). The frontliners involved in the project at each of the sites are listed below: the PDOA/North Central Province (NCP), the Department of Agrarian Development (DAD), LUPPD,

Divisional Secretaries, Forest Department (FD), Department of Wildlife Conservation, Medical Officers of Health and Ayurveda Doctors of Thirappane and Palugaswewa, and the Senior Surveyor Superintendent Office. These agencies are expected to help implement most of the pilot level action activities.

34 **Finding 13.** Criteria used for identifying target cascade sites and pilot areas were the following: lack of accessibility to new technology and equipment with knowledge; lack of extension services, input flows, and infrastructure facilities; marketing problems; tank siltation and facing water scarcity; land encroachment problems; dry weather and climate and human – elephant conflicts. These appear reasonable though criteria related to ecosystem, biodiversity, land degradation, and socioecological dimensions were not highlighted.

35 **Finding 14.** Land use in the proposed cascades and pilot sites suggest that the *chena* lands (rainfed uplands, sometimes on the forest fringes) are the predominant land use in most of the cascade sites. These rainfed areas occupy larger areas than paddy, homesteads, and home gardens. *Chena* lands support watershed protection objectives to enable downstream water supply. The *chena* lands provide special opportunities for fruit tree-based agroforestry systems and the enrichment of agrobiodiversity. *Chena* lands provide some of the best opportunities for crop intensification (e.g., for millets, legumes, groundnuts and upland crops like corn/rainfed rice within tree-based systems). The PDOA and FD can collaborate in establishing *chena* land-based demonstrations in each of the two proposed pilot sites. However, without decentralized seed systems, the scaling might not happen.

Figure 7. *Chena* rainfed lands offer the best opportunities for crop intensification.



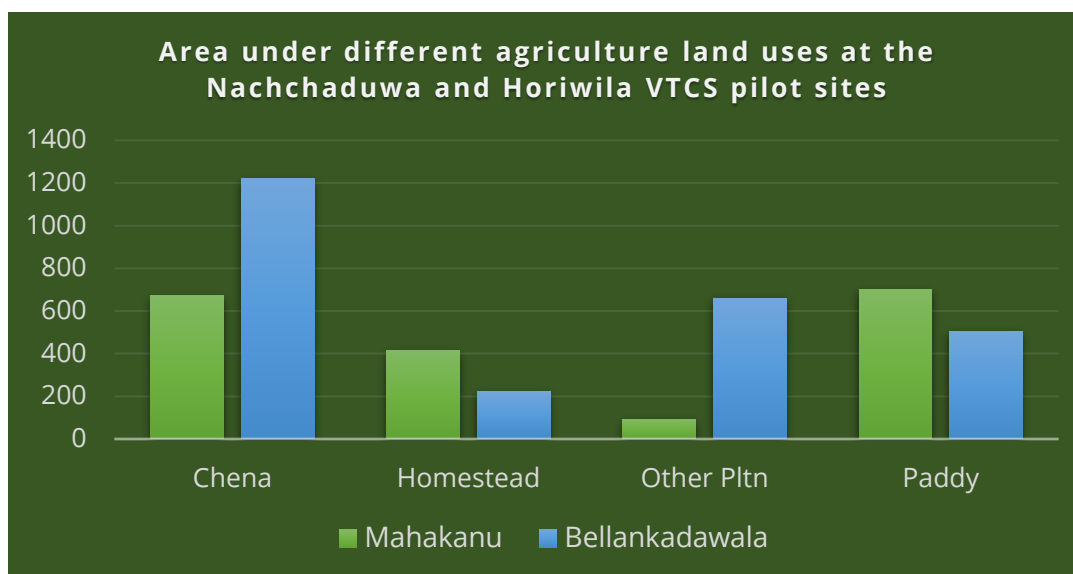


Figure 8. Agriculture land uses of the pilot sites.

36 The rainfed areas are also emerging as sites where young people (with necessary investments in the form of dug wells, drip irrigation, and tree seedlings) can demonstrate their entrepreneurial skills. Diversified smallholder vegetable or fruit systems are important pathways for young people to be engaged in agriculture. *Chena* lands should receive more attention in efforts to help raise incomes through biodiverse small farms especially for young people. The *chena* lands (and home gardens) provide more opportunity for promoting biodiversity-based options than do the paddy lands. The PDOA and the FD (see next point) can contribute to these in a complementary manner.



Figure 9. With the restoration of degraded tanks, new opportunities arise for crop diversification using biodiverse systems of production.

37 Rice crop lands and associated flora and fauna benefit from tank restoration efforts. Rice remains a profitable crop, being one of the few options that farmers have for growing crops with relatively fewer chemical fertilizers. The nutrient levels of irrigation water from well conserved tanks (with forests and vegetation on their periphery ensuring nutrient flow loads), along with locally adapted rice varieties, will ensure that local rice needs could be met. Farmers are already growing traditional legumes post rice (green and black beans and cowpea). This practice is already being promoted by the PDOA but needs to be scale out. Farmers now have access to mechanization thus reducing labor requirements and fostering many opportunities for crop intensification. There is a future for sustainably grown rice as a food and commercial agriculture crop that grows under limited external chemical inputs (unlike nutrient demanding corn, for example). There is also a future for restoring rice agrobiodiversity (with antioxidant-rich red and black rice cultivars). A further link to outputs from the BFN (and BACC) projects, which explored the nutritional diversity of rice agrobiodiversity should be explored. The PDOA can help ensure that agrobiodiversity can be featured prominently in both pilot sites.



Figure 10. The restoration of tanks and associated rice landscapes provide new niches for restoring rice climate-smart and nutritionally relevant agrobiodiversity.

38 Home gardens were promoted by HLP as platforms for enhancing biodiversity. The FD and PDOA are aware of this but more needs to be done and, on wider scale, beyond pilots here and there. The Kandyan home gardens are known for their role in conserving agrobiodiversity. However, there is also interest in vegetables and fruits in the Dry Zone of Sri Lanka. Schools could play a bigger role in contributing to conserving and multiplying seeds of indigenous vegetables. Seed diversity kits could feature prominently in such an effort to restore the vanishing genetic resources of nutritional value. The Biodiversity for Food and Nutrition (BFN) project, which Sri Lanka was part of, can inform HLP in this effort to get schools and home gardens involved in agrobiodiversity conservation through sustainable use.



Figure 11. Over 7 varieties of bananas were counted during the MTR. Bananas are drought and heavy rain tolerant (and serve as food and feed).

39 **Finding 15.** The MTR mission met with the Forest Department officials in Anuradhapura. The rehabilitation of degraded forests is one of the Department's priorities. This includes land that was cleared for agricultural purposes and subsequently abandoned. Interestingly, the FD has community-based programs, including home gardens, agroforest woodlots, and tree planting in cascade areas. Seven tank clusters are proposed for restoration with tree cover. These include the two pilot areas that the MTR has proposed for future emphasis (pilots). The FD supplies trees (timber, medicinal, and multipurpose trees) for home gardens. The FD maintains nurseries, although these are currently relatively small (200,000 to 300,000 seedlings) given the seedling requirements of the Divisions. Aside from the suggestion to include HLP target sites, the reviewer asked the FD if they could put bigger emphasis on Sri Lankan fruit species in their nurseries. This would be in support of home garden. There is considerable interest in adding local fruit trees to their program in support of schools, home gardens, and family farms (especially in *chena* lands). The FD works in ecologically sensitive areas and this could include the HLP proposed ecotourism site where indigenous fruit and forest trees could be featured in order to inform and educate the public on fruit and banana biodiversity. With the help of the FD, schools in the ecotourism sites could set up crop museums featuring fruit diversity gardens. Indigenous multi-purpose forest species can be featured in tree-based restoration work in the tank catchment areas. The FD could be an important partner in strengthening the efforts to enhance biodiversity-based options in HLP activities. PMU would do well to follow up their engagement in the two pilot sites starting this *Maha* season (main cropping season).

40 **Finding 16.** Sri Lankan culinary tradition and food culture is rich and currently reliant on and influenced by the rich agrobiodiversity associated with family farms, home gardens, and forest ecosystems. This was mapped and characterized by the BFN project and therefore serves as a platform to build on. There is a need to preserve food culture and associated biodiversity. Food markets are a valuable mechanism to counteract the influences of fast food on young people. HLP plans to establish food market centers (*Hela Bojun* Centers) remain relevant and valid. Plans are underway in each of the two divisions to set up these centers (1.5.6). Over time, these pilots can help mainstream food marketing centers as a way of renewing interest in food culture and associated biodiversity.



Figure 12. Sri Lankan food culture is already “nutritionally rich”. By patronizing local food recipes, the sustainable use of agrobiodiversity is also promoted.

41 **Finding 17.** In work with local communities in any type of agriculture or natural resources project, social protection issues are likely to surface. Nutrition support is important for addressing health concerns but also important because it offers a platform for integrating agrobiodiversity (1.4.3). Nutrition, health, and overall wellbeing are important prerequisites for project success. The HLP efforts to support children’s nutrition are undertaken via the Medical Officers of Health or Ministry of Health (MOH). The reviewer was able to attend one such event in Thirappane (during the mission) where children were fed nutritious food based on locally available ingredients. Demonstrations on school meal preparation and on the use of plant-based medicine (Ayurveda) were included.



Figure 13. Social protection in the form of nutrition intervention is essential and justified in any development undertaking. Local millets, local herbs, colored hue rice, and legumes are featured in this feeding effort.

42 **Finding 18.** Output 1.4.1 refers to sustainable land management practices which reduce human-animal conflict in tank cascade areas. Until the reviewer met with officials from the Department of Wildlife Conservation (DWC) in Anuradhapura, it was difficult to understand how serious the issue was: 26 people were reported killed in the previous eight months, three of them in the week before our visit to the DWC. A day after the MTR visit to the pilot site (Dayagama in Walagambahuwa) to inspect the electric fences established by the Ecosystem Conservation and Management (ESCAM) project with the social mobilization support of HLP, one person was killed. Human-elephant conflict is a serious problem because much of the cascade area is still under forest cover. With changes in land use (especially for large scale maize production in forest fringe areas), elephant habitats are disturbed. There is little continuous forest areas and associated corridors for some elephants (900) in the district. The large increase in maize area and the presence of water sources of already large numbers of tanks has contributed to an increased presence of elephants in areas inhabited by humans. The idea of electric fences was derived from the project-related participatory rural appraisal undertaken during the PRA exercises in the Palugaswewa cascade under project component 1. Thirteen fences are to be constructed to protect people and their farms from wild elephants. The MTR was able to visit one such site where electric fences are being established. The World Bank-supported ESCAM Project is already using these methods to reduce human-elephant conflicts and crop losses. The HLP helped mobilize local communities in what can best be described as self-help approaches to managing electric fences. This involved the HLP helping mobilize communities for monthly savings (to maintain the fences once established). Labor is invariably voluntary thus demonstrative of strong community interest in electric fences. To reduce further encroachment of forest lands (elephant habitats) assistance is also being sought from the HLP to pilot test the idea of land demarcation around forests in the Nachachaduwa pilot site. The relocation of some of the elephants might be considered given the large numbers of elephants. These are measures to reduce animal – human conflict which remains a major issue for people in the tank cascade areas.

43 **Finding 19.** Component 3 has critically important contributions to make in knowledge mainstreaming and capacity development (on cascade ecology, ecosystem services, and landscape management in the VTCS) within national extension, research institutions, universities, and other educational institutions. Associated with this is the goal of establishing a community of practice on cascade ecology (3.1.2). This important task was rightly assigned to a university entity, the Rajarata University, with plans being made for its launch in 2023. The State of Knowledge book on Cascade Ecology (3.1.3) is also considered as an output for the last years. However, it would be prudent for the HLP/PMU to undertake a critical assessment of the added value of this Cascade Ecology book (by Rajarata University) if the proceedings of the CEM conference will also be published by Peradeniya University. One single major knowledge book would be the advised with both universities collaborating to producing this. Such a publication could be part of the *Issues in Agricultural Biodiversity* jointly published by Bioversity International and Routledge.

44 **Finding 20.** The development of relevant curricula materials on cascade ecology and cascade ecosystems is planned [use by universities, schools, and the informal sector (3.2.2 and 3.2.3)] with the Rajarata University playing a lead role. Workshops to be organized by Rajarata University are also planned for policy makers on the same topics (3.2.4). This remains a high priority because of the long-term impacts of engaging in curricula and course development activities on cascade ecology/cascade ecosystems. There are other activities such as consultative workshops with universities (3.2.1) that can be subsumed by other activities.

45 **Finding 21.** During the PSC meeting (conducted during the review mission), PSC members raised several valid points, which the reviewer fully subscribes to. It was argued that the HLP must do much more to feature the cascade ecology dimensions in its sustainable (cascade) landscape management. The need for enhancing biodiversity-based options in cascade landscape management was also raised as was the need for the LUPPD to include ecological and ecosystem health considerations. During the PSC meeting it was suggested to commission an overarching paper that brings in these dimension (referred to as a synthesis effort, because it was expected to rely on past work of similar initiatives). This proposal was endorsed by the reviewer.

46 **Finding 22.** Given the diversity of land use types and associated natural resources, as well as the project's emphasis on restoration and conservation of the tanks and the surrounding catchment areas, the project is and will (in the future) contribute to the GEF Strategic Outcome 7 for increasing genetic diversity. Moreover, several studies undertaken during the baseline and others presented during CEM2021 have done an excellent job in mapping the biodiversity, including agrobiodiversity. Another study undertaken within the target site - the *Land Use Participatory Assessment of Ecosystem Services for Ecological Restoration of Village Tank Cascade Systems of Sri Lanka* (by S.S. Ratnayake and colleagues) – demonstrates that species-based ecosystems services already play an important role in generating services associated with the biophysical elements of land use. The planned source books and related project briefs are expected to address the dimensions of GEF Strategic Outcome 7 via the case studies that will be generated.

47 **Finding 23.** The challenges faced by the project have been mentioned several times in this report. During this time, the Alliance of Bioversity International and CIAT, SACEP, and the PMU have maintained contact. The project was faced with an extraordinary range of setbacks. The reviewer did not hear of serious communication issues between the main entities. The frustration with delays and delayed start-up was natural and expected. That is now history and what matters is how the HLP can take advantage of whatever timeframe it has ahead of it to deliver on results that matter. The PMU needs more discretionary funding in order to respond more effectively and

efficiently. Also, as an incentive to partner agencies to prioritize HLP activities, a modest two-day allowance per month might be provided (the reviewer was told that this is a practice in some internationally funded projects).

III. FACTORS AFFECTING PERFORMANCE

Evaluation Ratings Table

48 The review will provide individual ratings for the evaluation criteria described in the table below. Most criteria will be rated on a six-point scale as follows: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU). *Sustainability and Likelihood of Impact* are rated from Highly Likely (HL) down to Highly Unlikely (HU) and *Nature of External Context* is rated from Highly Favourable (HF) to Highly Unfavourable (HU).

| Criterion (section ratings A-I are formed by aggregating the ratings of their respective sub-categories, unless otherwise marked) | Summary Assessment | Rating |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------|
| A. Strategic Relevance | | HS→HU |
| 1. Alignment to MTS and POW and the GEF strategic priorities | HS | HS→HU |
| 2. Relevance to regional, sub-regional and national environmental priorities | HS | HS→HU |
| B. Effectiveness¹ | | HS→HU |
| 1. Delivery of outputs | MU | HS→HU |
| 2. Achievement of direct outcomes | HU | HS→HU |
| 3. Likelihood of impact, where appropriate/feasible | S | HL→HU |
| C. Financial Management | | HS→HU |
| 1. Rate of spending | U | HS→HU |
| 2. Quality and consistency of financial reporting | S | HS→HU |
| D. Efficiency | | HS→HU |
| E. Monitoring and Reporting | MS | HS→HU |
| 1. Monitoring design and implementation | MS | HS→HU |
| 2. Project reporting | MS | |
| F. Sustainability (the overall rating for Sustainability will be the lowest rating among the three sub-categories) | HL | HL→HU |
| I. Factors Affecting Performance² | | HS→HU |
| 1. Preparation and readiness | MS | HS→HU |
| 2. Quality of project management and supervision ³ | S | HS→HU |
| 3. Stakeholders participation and cooperation | HS | HS→HU |
| 4. Responsiveness to human rights and gender equity | S | HS→HU |
| 5. Country ownership and driven-ness | HS | HS→HU |
| 6. Communication and public awareness | HS | HS→HU |
| Overall project rating | MS | HS→HU |

¹ Where a project is rated, through the assessment of Project Design Quality template during the evaluation inception stage, as facing either an Unfavourable or Highly Unfavourable external operating context, the overall rating for Effectiveness may be increased at the discretion of the Evaluation Consultant and Evaluation Manager together.

² While ratings are required for each of these factors individually, they should be discussed within the Main Evaluation Report as cross-cutting issues as they relate to other criteria. Note that catalytic role, replication and scaling up are expected to be discussed under effectiveness if they are relevant part of the TOC.

³ In some cases, 'project management and supervision' will refer to the supervision and guidance provided by UN Environment to implementing partners and national governments while in others, specifically for GEF funded projects, it will refer to the project management performance of the executing agency and the technical backstopping provided by UN Environment, as the implementing agency.

IV. RECOMMENDATIONS AND CONCLUSIONS

A. Recommendations

49 **Recommendation 1.** If the Project Outcome is to be achieved, all efforts need to be directed to converge on one pilot site in each of the two target cascade sites. The MTR recommends reducing the pilot sites from five to two given the need for delivering outcomes at site level. The two target pilot cascade sites are the Bellankadawala Cascade within the Horiwila Tank Cascade and Mahakanamulla Cascade within the Nachchaduwa Tank Cascade. Implementation mechanisms will have to be undertaken in an integrated/converging (and not piecemeal manner), with a single focal agency providing oversight to all pilot site field level implementation. The relevant two divisional secretariats are in the best position to coordinate efforts at each of the two sites with the HLP PMU Office providing oversight.

50 A functional and well-funded (unified) frontline extension mechanism is essential to deliver results at scale within these sites. The PDOA, FD, DWC, and DAD all have front line workers who will deliver at community/tank level. Mechanisms to compensate the time and extra effort of managers within these agencies (2 days a month) has been proposed, to encourage staff to provide the special attention HLP needs. Apparently, such arrangements have been used by other projects in the country.

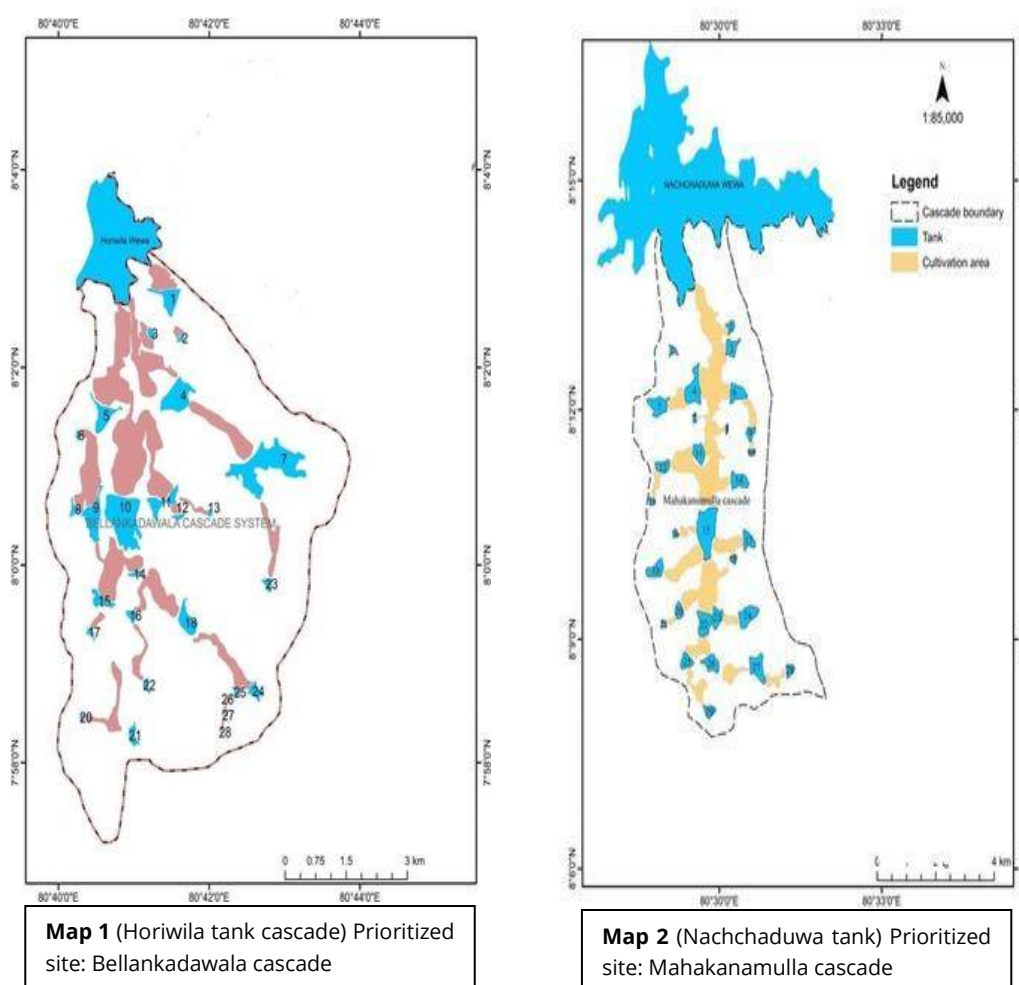


Figure 14. Proposed two pilot sites for focus 2022 to 2023.

51 **Recommendation 2.** Output 1.1 emphasized the need to map socioecological and biophysical properties. This involved the completion of baseline studies, which the MTR has already highlighted elsewhere as being outstanding contributions of the HLP because of the breadth and depth of themes and topics covered. It might therefore be unwise to invest more resources on Output 1.1. The HLP delivered very well on Output 1.1 and in some ways exceeded expectations (quality of baseline outputs and CEM conference outputs). Therefore, we can consider Output 1.1 completed with considerable success. With a rich and comprehensive database (baseline studies 1.1.1 and conference report) now available, there is huge need to shift emphasis to establishing and scaling out biodiversity-based agroecological landscape restoration and management at cascade level (Outputs 1.3 and 1.4).

52 **Recommendation 3.** Output 1.3 on demonstration on scale about how restoration and rehabilitation of VTCS is done must receive special attention. Three tanks with full cost estimates prepared, were proposed for restoration. These are for Bellanakadala, Thumbikulama, and Rambawewa tanks. Obviously, these are high priority activities (Output 1.3.1 to 1.3.8). However, it is recommended to pursue only those proposals for restoration that can be completed in a single phase and within 2023 (some proposals are in multiple year phases that are now beyond the scope of HLP). The DAD is urged not to limit its engagement to the physical restoration of the tanks but also contribute by restoring forest biodiversity in the tank landscapes (around the tank structures and tank environs). The DAD and the FD should give priority to restoring the micro-catchment areas (under the responsibility of the DAD) and upper course forest areas (under the responsibility of the FD). The picture below from Schutt et. al. (2013), provides some reminders of the niches for tree biodiversity enhancement.

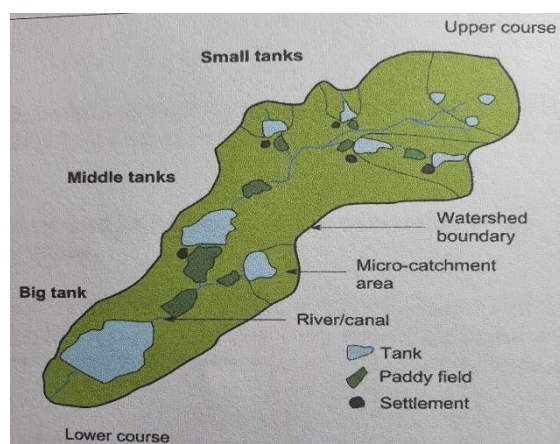


Figure 15. A typical cascade system.

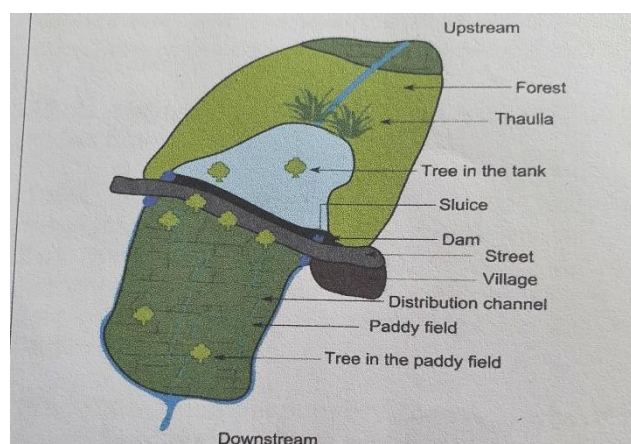


Figure 16. Areas around tanks.

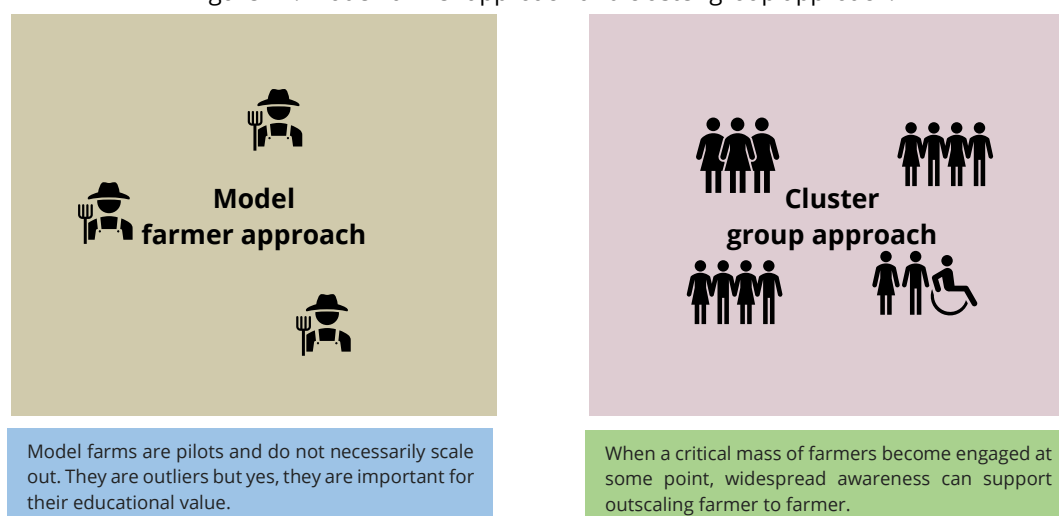
Source: Schutt, B et.al., 2013. Characterization of the Rota Wewa tank cascade system in the vicinity of Anuradhapura, Srilanka. J. Geographical Society of Berlin, Volume 144, No. 1, pp 51-68.

53 **Recommendation 4.** The DAD should prepare case studies for each of the three restoration efforts in two pilot cascade sites. These six- to eight-page case studies should document the process, results, costs, and benefits with before and after pictures. This recommendation was already forwarded to the DAD team during the MTR exchanges. These case studies would be useful for future restoration efforts. This case study material will be of relevance to the curriculum work and source book preparation that the Rajaratha University is engaged in.

54 **Recommendation 5.** Give special priority (as with restoration of VTCS) to the demonstration of biodiversity-based agroecological and sustainable integrated land

management (Output 1.4). In order to generate demonstrable impact on scale, consider a strategy for achieving a critical mass of adoption at the two pilot cascade sites, then utilize them as proof-of-concept sites for advocacy and learning efforts. HLP could focus on a geographic cluster of 25 farming families in *each* of five villages in the two pilot cascade sites. These 125 farmers in each of the two pilot sites will be assisted financially and technically in establishing intensive and diversified farms. These farmers would apply agroecological principles which also feature biodiverse forms of agricultural intensification (Output 1.4). The HLP project would have to go beyond a few individual model farms that are the target of visits. A farmer-to-farmer approach relying on clusters, is more likely to contribute to outscaling. The PDOA and the FD were very open to testing this approach to local outscaling.

Figure 17. Model farmer approach and cluster group approach.



55 **Recommendation 6.** Demonstrate in at least two selected communities the role of trees in restoration. Rely on large-scale nurseries of fast growing, short duration, fast growing multipurpose trees of relevance to soil restoration, green leaf manure, and having relevance to livestock or/and human nutrition. An emphasis on underutilized and local fruit tree species would be of special value. The promotion of these tree species would be supported through the establishment of large-scale community nurseries (located near water sources). The current emphasis is on medicinal plants with the Ayurveda Department, which though useful (1.3.6 and 1.3.7) would not meet the wider objectives envisaged by the designers for 1.3.5. The FD can be given this challenge of delivering on 1.3.5 while also demonstrating the role for decentralized large scale, mixed species nurseries located within the two target cascade sites. The FD has the staff already located within the proximity of the two sites and have expressed interest in this idea.

56 **Recommendation 7.** Give special priority (as with restoration of VTCS) to the demonstration of biodiversity-based, agroecological and sustainable integrated land management (Output 1.4). Find niches and start to demonstrate the value of biodiversity-based approaches to improving agriculture in home gardens, farms, and associated agricultural landscapes. These approaches could be a mechanism for the enrichment of agriculture landscapes with fruit trees, shrubs of nutritional importance, for both humans and animals as well as for medicinal purposes (for both humans and animals). It is important to find entry points to integrate, protect, and restore green elements such as forested buffer zone hedges along fields and connectivity with agriculture

landscapes. Outputs 1.4.1, 1.4.2, and 1.4.3 deserve special attention with the PDOA and can be limited to pilot sites in target landscapes.

Figure 18. Multistoried and biodiverse cropping systems can serve as anticipatory climate adaptation



measures. Such systems are enhanced incrementally, over a short period of 2 to 4 years.

57 **Recommendation 8.** Given the challenges Sri Lanka is currently facing with rising food prices, the HLP might want to continue its plan for conducting 25 health camps and nutrition programs. This form of social protection (occasional school feeding) engagement might serve to catalyze future programs to mainstream such approaches. Every event should provide an opportunity to showcase local food culture and local biodiversity. This engagement is legitimate and justified as a social responsibility of the project provided it was also bundled with an educational component. The HLP should also work with the Dept of Education in establishing school gardens and a crop museum program in Anuradhapura district. The Philippines might provide some learning opportunities for enhancing the HLPs school-based garden and nutrition programs.

58 **Recommendation 9.** HLP should link up with the FRESH Initiative on Fruits and Vegetables of the One CGIAR. This would not only help further the Agrobiodiversity Agenda of HLP but as a ten-year initiative, it might provide HLP partners with continuity beyond the end of the HLP project

59 **Recommendation 10.** The Hiriwaduna ecotourism site could be a showcase for the HLP (1.5.5). There is strong interest by the Divisional Secretary of Palugaswewa. Tank-based tourism could be showcased at this site visited by the MTR consultant. The basic infrastructure would need to be developed with small strategic investment made (toilets and minor road repairs and dredging of silted areas where the boats are launched). This is indeed a high priority engagement for the HLP. There is an opportunity here for the project to showcase indigenous fruits growing in home gardens at these ecotourism sites and to establish market links for promising products. Colored rice varieties could be promoted in the rice fields within the area. The idea of a best practice book on tank-based ecotourism is a good idea which should be pursued. Links with the private sector hotel industry could also increase tourists' inflow.



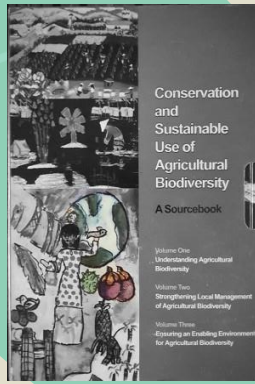
Figure 19. Well preserved tanks offer scope for local ecotourism.

60 **Recommendation 11.** Use a unified, comprehensive, and participatory knowledge utilization and knowledge garnering process to generate knowledge products (2.1, 2.4, 3.2, 4.2) resulting in a single source book. The practical nature of such a source book is suggested by the following proposed title: *Delivering on Cascade Ecology and Ecosystem Health: Sourcebook for Provincial and District Level Officials*. The drafting of this sourcebook could be led by Rajarata University under Component 3 since the University will be engaged in curricula and course development on cascade ecology and cascade ecosystems. This single compilation of best practices on cascade/tanks would draw on past work (International Union for Conservation of Nature, International Fund for Agricultural Development, and Asian Development Bank, International Water Management Institute etc.) on cascade rehabilitation and restoration and current work with the HLP. Thus, Activities 3.2.1 to 3.2.4 can be consolidated (see proposed results framework and work plan in the annexes).

62 **Recommendation 12.** With the available timeframe, consider designing a single draft curriculum (3.2.2) on cascade ecology and ecosystems' health. This can serve as a trainer's and educator's guide (Component 2 and 3). This curriculum can serve as a prototype for other educators who want to adapt these for other audiences. The primary participants at this curriculum design workshop would be other universities: University of Peradeniya, Rajarata, and others. A participatory curriculum development process is suggested for arriving at this curriculum relying on simple steps: establish a curriculum design team to guide, mentor, and develop draft curricula; rely on the baseline studies and CEM2021 outputs to design the core curriculum; assume the course will be week-long with a component for field learning exposure; rely on the drafted core curriculum to develop versions for university level certificate courses, school modules, and district training institutions; the version adapted for university courses will include a more extensive list of case studies and references (drawn from CEM2021 and the baseline studies' reports).

Figure 20. Key steps for sourcebook production.

1. Establish a KM knowledge group to design, mentor, and monitor the process
2. Rely primarily on already available resources (baselines, CEM, guidelines)
3. Prepare a list of 25 to 40 key topics (which already have supportive evidence/information) to serve as a single reference sourcebook
4. Will include Concepts, Practices, Guidelines, and Trainor References (three sections)
5. The audience for this sourcebook will be development administrators, extension managers, trainers, and HLP cascade level teams
A design and development team repackages and develops a draft sourcebook in advance of a writeshop
6. Writeshop for 3 to 4 days for peer review and feedback
7. Publishing and circulation (with online and limited hard copy versions)
8. Title of sourcebook(?): Delivering on cascade ecology and ecosystem health: Sourcebook for provincial and district level officials



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63 **Recommendation 13.** Simplify the project's prior commitments regarding the preparation of policy support materials and related policy studies (4.2.5) by preparing a set of core reading materials in the form of briefs. The MTR consultant suggests that this be done by the University of Peradeniya (UoP): establish a working group to identify and pick out materials from CEM2021 of relevance to policy makers; set up a working group to draft thematic briefs targeted to policy makers and development administrators; conduct a policy makers roundtable event (one day) to comment and critique the briefs; and, limit the numbers to a few high priority topics: production of 12 to 15 briefs.

64 **Recommendation 14.** Instead of doing familiarization workshops for policy makers and administrators (3.2.4), consider organizing policy dialogue workshops which are more participatory in nature and serve to engage policy makers. These are one day events which are focused and thematic in nature and primarily undertaken to bring in the cascade ecology and ecosystems dimensions.

65 **Recommendation 15.** Merge all awareness and education activities under 2.1.2. Entrust the responsibility for coordination of awareness building activities (of DAD and LUPDD) to Divisional Secretaries. Three proposed major educational campaigns would subsume the large number of awareness activities previously proposed.

66 **Recommendation 16.** For community level and farmer group use, consider the use of posters and primers derived from other guidelines developed for the project. One standardized set of key messages, 12 posters, and maybe half a dozen primers would suffice. These are best led by a consultant under the PMU to ensure good coverage of key topics and to avoid any institutional biases.

67 **Recommendation 17.** The HLP and the Alliance of Bioversity International and CIAT (ABC) should consider publishing select papers from CEM2021 and the baseline studies in a dedicated title under the *Issues in agricultural biodiversity* series published by Earthscan in association with ABC. The aim of the series is to review the current state of knowledge in topical issues associated with agricultural biodiversity and to increase the sustainable use of biodiversity in improving

people's well-being and food and nutrition security. This action might be pursued in the next few months (there is no need to wait to the end of the project when other outputs will surface).

68 **Recommendation 18.** More needs to be done to contextualize the current work done on guidelines on landscape management to factor in ecological and ecosystem considerations in relation to cascade systems. A review of past cascade work is warranted to arrive at a synthesis and a set of recommendations (2.2.2) This is best done by a neutral, academic entity such as the Natural Resource Management Center (NRMC) under the DoA. The NRMC has a strong natural resource program with an ecology/ecosystem bias. The TAC members could play a major role here ensuring that an interdisciplinary orientation is taken (rather than narrow land use and management approach). Such a synthesis would involve also reviewing efforts prior to the HLP (IFAD, IUCN, IWMI, ADB and World Bank).

69. **Recommendation 19.** A no cost attention (NCE) is recommended to ensure delivery of planned outputs and activities (in their modified form as reflected in the new work plan to be found in the Annex)

B. Lessons Learned

70. The restoration of degraded landscapes provides many opportunities for the enrichment of biodiversity as well. However, the limited mandates of many line agencies require collaboration and partnerships with agencies whose mandates include biodiversity conservation and use. The divisional authorities can provide such platforms for complementation and collaboration.

71 Food security, better livelihoods, and household income remain major drivers for farmers in many remote areas. However, the poverty levels (and in case of Sri Lanka, the energy and fertilizer shortages) do not allow for investment to be made (e.g., trees, small livestock, etc.). Projects should plan for large scale and decentralized nurseries and acquisition and distribution of planting materials (one term basis only).

72 Addressing food security and nutrition should be viewed as a social protection measure that is everyone's business in a situation such as what Sri Lanka is currently facing. It is a legitimate area of engagement for the HLP. Fast track measures are needed with projects required to respond expeditiously as needed.

73 Much more can be done to build on past projects and build on the knowledge base of past MOE and UNEP/GEF projects such as the BFN and the BACC projects (to mention just two) and related projects funded by the World Bank, IUCN and IFAD

74 Specific measures are needed during the project design stage to avoid burdening local communities with studies and awareness building and training activities (e.g., each line agency having its own set of required trainings). Efforts must be dovetailed with a multi-agency platform to take responsibility for awareness building. Social media and mass media and information education campaigns can reduce the number of community level awareness building trainings and education activities to the most essential.

75 Similarly, multiple guideline development initiatives must factor in past efforts and build on them. A proliferation of new guidelines can be overwhelming for divisional administrators and might complicate implementation.

C. Conclusions

76 The HLP project was well conceived and timely, with its emphasis on restoration and sustainable management of tanks in cascade systems. It was creative and original in its effort to link these topics with the broader goals of ecosystem health and cascade ecology. A more widespread understanding of the nexus between climate, food, and biodiversity is needed amongst various partners. There is a bigger need for understanding the role that the VTCS can serve in climate adaptation. This can be addressed by plans for a synthesis paper, policy dialogue events/ policy briefs, the cascade ecology symposium, and state-of-the-art knowledge book (for academia and policy makers) and source book (for practitioners). Beset with an extraordinary complex set of issues which delayed the project, the HLP might still be able to deliver on its major goals and objectives. This is only because the project is fortunate to have relied on agencies with high levels of technical competence and with plans already done/or already under implementation (two out of four tanks). With the reduction of sites to two, and assuming a no-cost extension is approved, the HLP could achieve many of its original objectives and leave a legacy for local governments in Anuradhapura.



Figure 21. Restoring silted and degraded tanks are probably the best anticipatory climate adaptation options for many communities.



Figure 22. Healthy ecosystems: well-cared tanks and rice paddy areas.



Figure 23. Tanks within cascade systems help protect a diverse range of ecosystem services.