Tank Cascade System (TCS):
A Nature-based Solution for Achieving Climate Resilience in Sri Lanka's Dry Zone

Sujith S. Ratnayake[1], Sharon Mendonce[2], Teresa Borelli[2], Danny Hunter[2], Ajith Silva[3], Thushani Dissanayake[3]

[1]Ministry of Environment, Sri Jayawardenepura Kotte, Climate Change Division
[2]The Alliance of Bioversity International & CIAT
[3]Healthy Landscapes: Managing Agricultural Landscapes in Socio-ecologically Sensitive Areas to Promote Food Security, Well-being and Ecosystem Health project

INTRODUCTION

Level

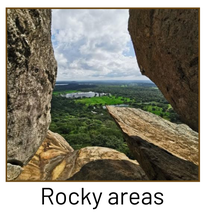
Field

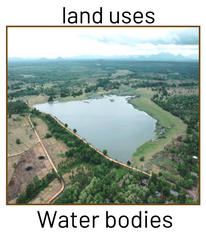

Agricultural lands


Built-up areas


Forest lands

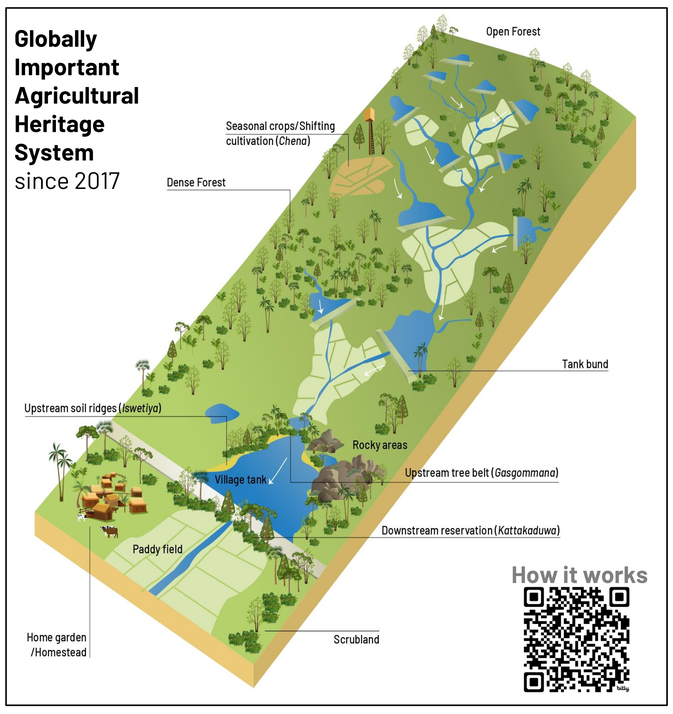

Ecologically important micro-land uses


Rocky areas


Water bodies

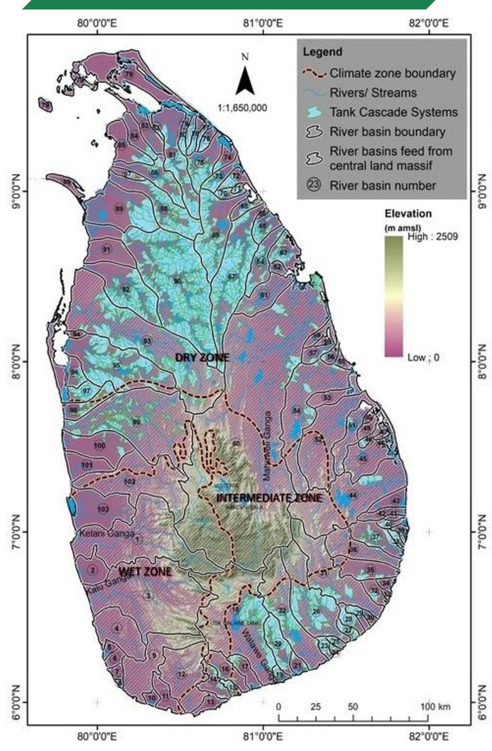
Cascade Landscape (TCS)

Globally Important Agricultural Heritage System since 2017



How it works

National



TCS as a nature-based solution

- Inspired by **nature**
- Tackles **societal challenges**
- Provides **multiple benefits** through its ecosystem services
- **Effective**

Challenges to TCS sustainability

Learn more

- Tank neglect
- Rapid land use changes
- Biodiversity loss
- Rainfall variability and extreme weather events
- Poor translation of national support into on- the- ground action
- Past TCS rehabilitation projects focused solely on improving agricultural productivity

OBJECTIVE AND METHODOLOGY

To strengthen the sustainability of the Tank Cascade System as a nature-based solution for enhanced biodiversity, food and nutrition security, rural livelihoods and climate resilience.

Healthy Landscapes: Managing Agricultural Landscapes in Socio-ecologically Sensitive Areas to Promote Food Security, Well-being and Ecosystem Health **project** (2018-2024)

Renovating TCS

Rehabilitating the TCS to meet changing **human needs**, while enhancing **agrobiodiversity** and minimizing pressure on the **environment**

Raising Awareness

Establishing the concept of **'cascade ecology'*** among the project's beneficiaries and stakeholders, as a basis to guide sustainable management of the TCS

Building Partnerships

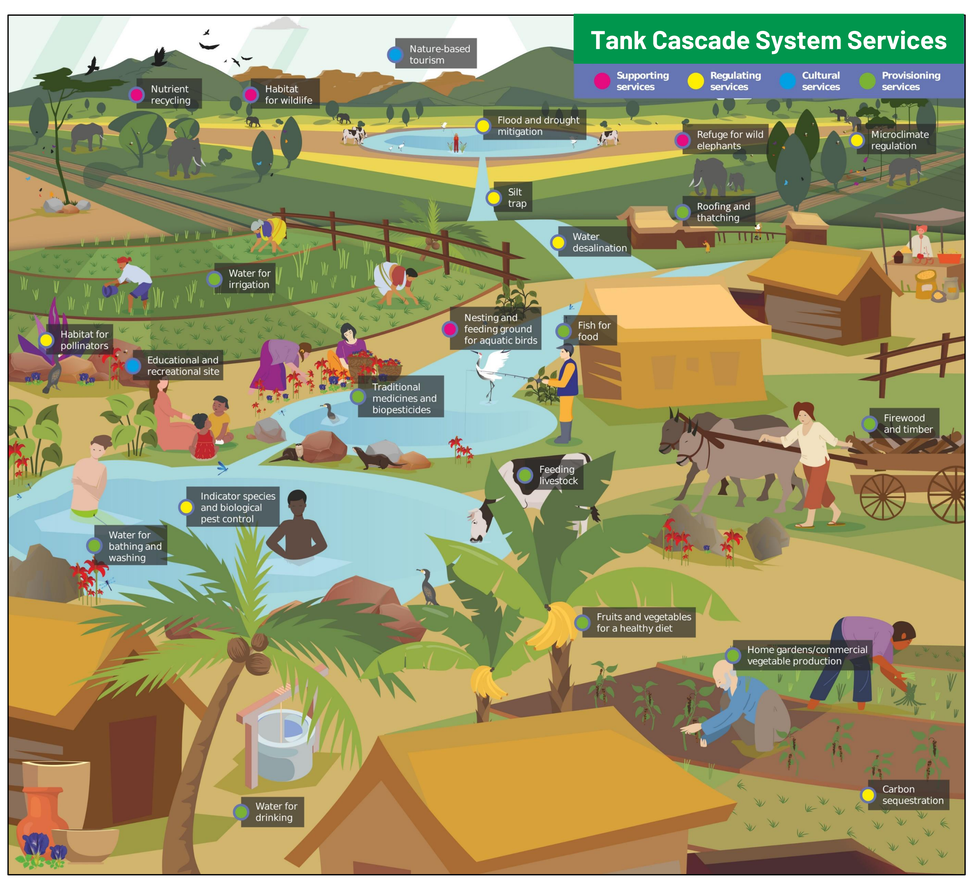
Fostering **collaboration** and building **capacity** among and across all levels of stakeholders to support the sustainable management of the TCS

Strengthening Policy

Engaging key partners to strengthen TCS sustainability through improved **policy formulation and implementation**

*__Cascade ecology__ describes the interactive relationships between living organisms (flora and fauna), including humans, and their physical environment (soil, water and geo-morphology) within the tank cascade system boundary as well as its surrounding area of influence.

Read more and see the project sites



RESULTS

Field-level results

5 tanks renovated

300 farmers trained in **sustainable land management (SLM)** and applying knowledge on 1,000 ha of agricultural lands

500 ha of **forests and ecologically important micro-land uses restored** and **10 community seed banks** (CSBs) established through government-community collaboration

Identified **key TCS ecosystem services** prioritized by local community and farmers' views on **climate change pressures**

Landscape -level impacts

- The Thumbikulama tank is in the upper cascade of the Belankadawala TCS and is the third largest tank in the system- it is crucial for **recharging tanks lower in the system** and as a **wildlife water hole**
- **Well water levels** in surrounding villages were maintained during prolonged drought (2023-24)
- **Soil moisture conservation** maintains upland (rainfed) farm productivity, despite seasonal droughts
- SLM practices **minimize soil erosion, and subsequent tank siltation and sedimentation** in TCS maintaining tank storage capacity and ensuring proper functioning of the system
- Restored vegetation in ecologically important micro- land uses contributes **to ecological balance** of the TCS and acts as a filter, improving **water quality and safety**
- **CSBs** help maintain well-adapted, **traditional agrobiodiversity in the TCS,** e.g., finger millet (*Eleusine coracana*) is drought tolerant, grows in degraded soils and is resistant to common pests and diseases
- Today, traditional TCS management is replaced by more centralized governance structures, but a large part of the **success of TCS related policy implementation** depends on **local community involvement**
- Identifying community priorities and perceptions helps **formulate improved policies** for TCS sustainability

**This is not an exhaustive list of results, please refer to 'further reading' for further information..

CONCLUSIONS

- The **TCS** has sustained cascade landscape communities and wildlife for centuries. With its time-tested adaptations to local climate, its **rehabilitation and sustainable management** are **crucial for strengthening climate resilience in Sri Lanka's dry zone.**
- Field-level activites impact the entire cascade landscape. Considering **cascade ecology when planning rehabilitation projects and formulating TCS related policy supports** the **system's sustainability** and its continued provision of **ecosystem services.**
- To be successful, **localized strategies for climate adaptation, climate resilience and sustainable land management** in cascade landscapes **must ensure that local administrations and communities** living in TCS **are meaningfully engaged and supported** to provide input into the formulation, implementation and monitoring of cascade landscape restoration and management.

The **Global Environment Facility** (GEF), the world's largest public funder of international environmental projects, is supporting the Healthy Landscapes: Managing Agricultural Landscapes in Socio-ecologically Sensitive Areas to Promote Food Security, Well-being and Ecosystem Health led by Sri Lanka, through the **Ministry of Environment** as the Lead National Agency. The **Alliance of Bioversity International and CIAT** is coordinating the project with implementation support from the **United Nations Environment Programme** (UNEP).

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Further reading

Contact:
Sharon Mendonce
Research Fellow
Food Environment and Consumer Behavior
s.mendonce@cgiar.org