

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



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## INTRODUCTION

### Field

### 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

- 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

**Tank Cascade System Services**

- Supporting services: Nutrient recycling, Habitat for wildlife, Water for irrigation, Water for drinking, Water for bathing and washing, Fertilizer production, Home gardens/commercial vegetable production, Carbon sequestration
- Regulating services: Flood and drought mitigation, Silt trap, Water regulation, Nesting and feeding ground for aquatic birds, Fruits and vegetables for a healthy diet
- Cultural services: Nature-based tourism, Refuges for wild elephants, Roofing and thatching, Firewood and timber
- Provisioning services: Microclimate regulation

## 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 **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 activities 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.

