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## Tank cascade system: A nature-based solution for achieving climate resilience in Sri Lanka’s dry zone

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### Abstract

The Tank Cascade System (TCS) is an ancient, man-made water management system unique to Sri Lanka’s dry zone. An ecosystem in itself, the TCS consists of an intricate network of small to very large ‘tanks’ positioned along a gradient and connected through a series of canals. Within the system, paddy fields and dense forests coexist providing habitats for ecologically significant species. Historically, the system has been crucial in drought and flood mitigation. Furthermore, fully functioning TCSs harvest copious amounts of rainwater, which is primarily used for irrigation to enable year-round crop production by the farming communities of the cascade landscape. The system’s important role in food security, rural livelihoods and local culture led to its designation as a Globally Important Agricultural Heritage System in 2017. Despite the TCS’s significance, the system has been deteriorating, and its sustainability is threatened by widespread tank neglect, rapid land use changes and biodiversity loss- the impacts of which are exacerbated by the effects of climate variability. There is national interest in safeguarding the TCS, though. The system has been recognised in Sri Lanka’s 2016–2025 National Adaptation Plan for Climate Change Impacts and within the 2021 Nationally Determined Contributions as an important Nature-based Solution (NbS) for strengthening national climate resilience. However, there is little evidence of this national support translating into on the ground action and of effective solutions to the challenges threatening TCS sustainability. This case study aims to fill these evidence gaps by sharing findings from research and project activities carried out under the Healthy Landscapes project ([https://alliancebiodiversityciat.org/sites/default/files/documents/Healthy%20Landscapes%20Project-Flyer\\_A4.pdf](https://alliancebiodiversityciat.org/sites/default/files/documents/Healthy%20Landscapes%20Project-Flyer_A4.pdf)). With a special focus on mainstreaming biodiversity and strengthening cascade ecology, the project rehabilitated and promoted the sustainable management of the TCS. This case study will highlight pathways for TCS rehabilitation to strengthen its function as a NbS, including associated challenges and further opportunities. As the cascade landscape community plays an important role in climate adaptation and resilience within the country’s dry zone, we also discuss their perceptions of current national policy and the importance of formulating localised adaptation strategies that benefit climate resilience, food security and rural livelihoods.

**Keywords:** Biodiversity, climate resilience, ecosystem rehabilitation, food security, nature based system, rural livelihoods, Sri Lanka