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A Geographical Analysis of Positioning and Functionality of the Tank Cascade Systems of the North Central Province

Sri Lanka

by

Ganthihe Mudiyansele Bandaranayake

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ABSTRACT

Key words: Cascades, Water efficiency, Catchment dryness, Water yield, Water surplus, Tank water intake

The cascade tank systems which have been structurally organized within river and stream basins are unique and widely spread phenomena of the Dry Zone landscape of Sri Lanka, where irrigation and water resources management have roots in the early history.

Most studies on tanks and tank cascade systems in Sri Lanka have dealt with the irrigation, water management and environmental aspects, based on individual locations.

Morphologically their formation, shape and size and their relation to the water availability from a spatial perspective have not been adequately studied.

Thus, the present study attempts to comparatively analyze the 'water efficiency of tank cascade systems' using remote sensing, and topographical maps interpretation together with field verifications. To achieve this objective the study observes the distribution and positioning of the tank cascades with emphasis on the physical setup to enable an analysis of water efficiency.

Placing greater emphasis on the spatial aspects of cascades, the study also attempts to differentiate the cascades on the basis of size, shape and destination points of water flow. This classification thus provides an appropriate framework to discuss the location and positioning of the cascades to designate the most efficient cascades in the sense of water availability

With the help of the Landsat image interpretation, the study attempts to view the environmental status, in particular the 'dryness' of the tank catchments in order to identify the water and moisture availability of cascades with different shapes to determine which type of cascade is more 'efficient' in maintaining a wet environmental condition.

Quantitatively, the 'cascade water yields' calculated by rainfall and evaporation, and the total tank water capacities are used to determine the most effective cascade types in the sense of water 'deficit' or 'surplus'.

In terms of 'systems theory' the present study also attempts to view how the tank cascades are presently functioning as 'real systems' with an inter-tank water flow system. In addition, from a social perspective, the people's perception or awareness of the cascading water flow system is used to further confirm the system functionality.

In sum, with the use of visual information together with quantitative data, the present study provides a basic guidance to identify the most important cascade types on which attention should be focused in the planning of small tank development in the Dry Zone of Sri Lanka.

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