

EVALUATION OF SURFACE WATER RESOURCES IN MALWATHU OYA CASCADE I

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In Sri Lanka, small scale irrigation tanks are usually connected sequentially to form cascades along the landscape. Some of these cascades were already evaluated in terms of quality and quantity of water. *Malwathu Oya* cascade I was not evaluated yet and this study was aimed to identify the quality and quantity of surface water resources in the *Malwathu Oya* cascade I.

Eleven small tanks in *Malwathu Oya* cascade I were identified and water samples were collected monthly from February to June 2011. Three samples were collected from inlet, outlet and stored water of each tank and analyzed for quality parameters such as temperature, dissolved oxygen, pH, electrical conductivity, total dissolved solids, turbidity, sodium, potassium, phosphorus, ammonium nitrogen, nitrate nitrogen and alkalinity. Water spread area was estimated using a global positioning system receiver. Tank cascade system and water quality parameters were mapped using Geographic Information System tool.

Tanks can be categorized in to 5 groups as 10–20 ha, 20–30 ha, 30–40 ha 40–50 ha and 50–60 ha on water spread area and number of tanks per each group are 3, 3, 3, 1, and 1 respectively. Results revealed that, water quality parameters were varied spatially and there was temporal water quality deterioration in the cascade. Water quality status were better in wet flow compared to dry flow, though, water quality is still good for irrigation even in dry flow in upper and middle parts of the cascade. Water resources at the bottom of the cascade showed slight to moderate salinity conditions during dry flow. *Nelumkanniya* which belongs to the middle part of the cascade showed low dissolved oxygen level; it may badly affect for fisheries sector.

Key words: Cascade system, GIS, Water quality parameters, Water spread area