

REPORT

**MANAGEMENT OF IRRIGATION WATER TO IMPROVE
PRODUCTIVITY OF PADDY LANDS IN THE POLONNARUWA
DISTRICT OF SRI LANKA**

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Irrigation practiced without considering the soil factors and crop growth stage may be one of the reasons for the existing yield gap between the potential yield (10 t ha^{-1}) and realized farmer yield (5 t ha^{-1}) in rice (*Oryza sativa* L.) in the Polonnaruwa District of Sri Lanka. Therefore, a study was conducted to determine the distribution pattern of irrigation water of the area and its relationship to rice yield. About 1.6 ha of farmer fields at the *Ambanganga yaya* in the Polonnaruwa District was selected as the study area. The rice variety Bg 352 was planted and the management practices were carried out as recommended by the Department of Agriculture. One inlet and two outlets were maintained at the field to measure the inflow and outflow of irrigation water. According to the drainage pattern of the field, perforated tubes were inserted up to 35 cm depth and measurements were taken daily as depth of standing water and depth to the water table. The Global Positioning System (GPS) was used to demarcate the sampling points and the field boundaries. Rainfall and evaporation data were collected from Angamedilla rain-gauge station. Thematic maps of water distribution during the cultivation season were prepared by using GIS.

The total rainfall received during the cultivation season was 717 mm while the total evaporation was 325 mm. Although, five acre-foot (0.616 hectare meter) of water has been supplied during the cropping season, the water distribution maps prepared during the study showed that the water table declined from one inch (2.54 cm) to one foot (30.48 cm) at all crop growth stages during an irrigation interval. In addition to sandy loam texture of the soil, water level declining due to high seepage, percolation losses and high runoff from field may be the reasons for 35 % of the losses of input water. As such, rice crop in the area faced severe water shortage during the cropping period. Even if remedial measures for soil problems and other practices were introduced during the past six years, water shortage remained as a cause for yield gap between potential and the realized yield. Proper management of irrigation water should be practiced along with the other practices to obtain the full potential of the paddy fields of the Polonnaruwa District of Sri Lanka.