

EVALUATION OF CROPPING SYSTEMS TO INCREASE
PRODUCTIVITY AND CROPPING INTENSITY UNDER TWO VILLAGE TANKS
IN DRY AND INTERMEDIATE ZONES OF SRI LANKA

By

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ABSTRACT

Village tanks (VTs) are important irrigation sources in the domestic agriculture sector in the dry and intermediate zones of Sri Lanka. The VTs (and anicuts) contribute 20 % to the total rice production of Sri Lanka. The major problem for the farmers in the VT systems is that severe water scarcity mainly during Yala and some Maha seasons resulting severe food production problems, low cropping intensity and low productivity under them.

A study was conducted in two selected sites in the dry and intermediate zones with an overall objective to develop an appropriate package of cropping systems to optimize the utilization of land and water and to maximize farmers' income in VT systems. The specific objectives were, identification of currently practised traditional cropping systems, assessment of income generated by the presently adopted cropping systems, evaluation of cropping patterns developed by the Department of Agriculture (suitable for command areas in Yala and Maha), and identification of the possibility of using ground water in command areas, especially in Yala.

Ambalegoda and Elapathwewa VTs located in the north-western province (IL₃) and north-central province (DL₁), respectively were randomly selected, from the list of the VTs rehabilitated under the National Irrigation Rehabilitation Project (NIRP) of Sri Lanka. Ambalegoda receives an average annual rainfall more than 875 mm while Elapathwewa

receives less than 750 mm. Reddish Brown Earth (RBE) and Low Humic Glay (LHG) (Ambalegoda and Elapathwewa) and Non Calcic Brown (NCB) (Ambalegoda) are the major soil groups.

To identify the traditional cropping systems, a questionnaire survey was carried out in the 1995/96 Maha. Climatological data and hydrological data were measured to identify the hydrological potentials and limitations. Probability of occurrence of a "dry Maha season" was calculated using long -term rainfall data (1940 - 1990).

Cropping patterns practised at Ambalegoda VT in the Maha (96/97) and Yala (1997) were evaluated using the indicators, land use efficiency (LUI), cropping intensity (CI), land equivalent ratio (LER), productivity and net return (NR) to important resource units (land, labour, capital, material cost, and irrigation water used).

The traditional cropping systems at Ambalegoda command area are rice-only (Maha) and rice or fallow the command area (Yala). At Elapathwewa, rice-only (Maha), and rice/OFCs using bethma system or fallow the command area (Yala). The probability of occurrence of a "dry Maha" was 18% and 14% at Ambalegoda and Elapathwewa, respectively.

Substantial rainfall was received at Ambalegoda to cultivate rice and chilli in Maha (96/97) and maize+groundnut intercrop in Yala (1997). As the Elapathwewa VT did not

receive adequate rainfall in both Maha (96/97) and Yala (1997) no cultivation in the command area was evident. The LUI of the rice+chilli cropping system at Ambalegoda was 64% higher than that of the rice-only cropping system during Maha (96/97). The NR in the former was 137% higher than the latter when family labour was excluded from the cost calculations. When family labour was considered, rice-only cropping system gave a higher NR, which was 17% higher than that of the rice+chilli cropping system. Chilli resulted in a significantly low return to labour. The maize+ground nut intercrop was a successful cropping system for the command area at the Ambalegoda VT. The resultant cropping intensity for the year 1996/97 was 121.5%. The ground water depletion studies using auger holes indicated the possibilities of using ground water for practising new cropping patterns.

Cropping system research should be continued based on these results to make a suitable package of cropping patterns to increase cropping intensity and productivity optimising land and water availability in the command areas of VTs.