A STUDY OF IRRIGATION WATER USE FOR PADDY CULTIVATION IN THE DRY ZONE OF SRI LANKA

MASTER OF PHILOSOPHY

BY

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DECLARATION

I herewith declare that the work included in the thesis in part or whole, has not been submitted for any other academic qualification at any institution.

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ABSTRACT

Water is a scarce resource in the Dry Zone of Sri Lanka and it is a major problem faced by the cultivators in the area. Since their cultivations totally depend on irrigation water, every possible effort should be put in order to optimize the water usage to achieve increased crop production. Recent reports on water management activities of several irrigation schemes in the Dry Zone indicates that the water distribution is not meeting the demands of farmers in terms of adequacy, reliability & timeliness. Further it was said that there is considerable potential to increase paddy yield in this system through improved irrigation water management, especially by efficient irrigation scheduling.

Following four study areas in the Dry & Intermediate Zones were selected from different irrigation schemes authorized by the different organizations.

i) Block 404 & 406 of Mahaweli system H

ii) Track 1 of Rajangana Irrigation scheme

iii) Ridi Bendi Ela irrigation scheme

The strengths and weaknesses of the presently adopted water allocations by the above schemes were identified. Further, the cultivation practices and present water usage in three irrigation schemes were compared. The irrigation requirements according to the Irrigation Department guideline recommendations were computed for each scheme using a spread sheet model and compared with present water usage in three schemes to find out optimum solutions for irrigation water use for paddy cultivation. The comparative analysis revealed that the practices adopted in issuing water in each scheme differ resulting disparity in water usage, farmers' satisfaction on water issues and paddy yield.

Considering the above comparisons, the recommendations for water issues during both land preparation & crop growth in paddy cultivation were presented pertaining to the most appropriate date of commencement and duration of the land preparation, the variation of depth of water application and frequency of irrigation during different growth stages of paddy with possible water saving techniques incorporating farmer needs. The optimum quantity of water requirement for the land preparation with maximum utilization of rainfall, most favorable quantity of water to meet the crop water requirement at different growth stages of paddy and the selection of best canal grouping to optimize the water distribution were also presented in the study.

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List of Abbreviations

AO	– Agricultural Officer
BIE	– Block Irrigation Engineer
D canal	– Distributory canal
DRPM	– Deputy Resident Project Manager
D1/406	– D1 Distributory canal in Block 406
D1/404	– D1 Distributory canal in Block 404
D2/404	– D2 Distributory canal in Block 404
Ea	– Application Efficiency
Ec	– Conveyance Efficiency
ET_C	– Crop Water Requirement
ETo	– Reference Crop Evapotranspiration
FAO	– Food & Agricultural Organization
FC canal	– Field canal
FIR	– Field Irrigation Requirement
FO	– Farmer Organization
ID	– Irrigation Duty
ID Guideline	– Irrigation Department Guideline
IE	– Irrigation Engineer
IMD	– Irrigation Management Division
IWMI	– International Water Management Institute
LB	– Left Bank
LHG	– Low Humic Gley
LP	– Land Preparation
LP_{ST}	– Land Preparation Water Requirement
LPIR	- Land Preparation Irrigation Requirement
LPWR	– Land Preparation Water Requirement
MASL	– Mahaweli Authority of Sri Lanka
RB	– Right Bank
RBE	– Reddish Brown Earth
RPM	– Resident Project Manager

List of Notations

MCM	= million cubic meters
1 cusec	= 28.3 l/s