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MODEL FOR OPTIMUM SCHEDULING OF WATER DISTRIBUTION IN UDAWALAWE IRRIGATION SCHEME

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Scheduling of irrigation water is essential for the satisfactory operation of irrigation systems. The conventional irrigation schedules distribute water along channels in pre-determined patterns. These fixed water delivery schedules resulting from rigid system operations do not guarantee the best management of the water available in the system for irrigation supply.

This paper presents a methodology to manage irrigation systems to maintain stable flows in channels, to reduce labour required for operations, to reduce total water requirements etc. The water allocation is based on obtaining an operation pattern for main canals of an irrigation scheme to reduce fluctuations in their water levels while minimizing the total water requirements. Irrigation water distribution plots were identified by the diversions from the main canal. The water demands of these plots are calculated in two parts as the on-field-water-requirements and the distribution and application requirement to supplement the associated losses. The losses are taken to be proportional to the duration of application. Several alternatives are formulated to supply these water requirements to the respective plots and the optimum combination of these alternatives is found to minimize the fluctuations in the main canal.

The model is applied to the right-bank canal system of the Udawalawe Irrigation Scheme in Southern Sri Lanka. The present irrigation extent of the right-bank canal is about 8000 ha. Rehabilitation of the canal system along with an improved operation propose to extend this to 12000 ha. Reduction in funds for operations of the canals in resent times has resulted in wastage of water during the holidays, due to lack of continued operation of the controls in the canals.

The results indicated better achievement of the above objectives. Proposed operating policy compared with the present operation has shown an improvement in the operations.