Role of Regulating Reservoir Operational Management in Performance Improvement of Moghan Irrigation Network

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Abstract

Poor performance of irrigation networks due to improper management and operation of irrigation canal structures has attracted the attention of managers to improve operational management of these structures. Regulating in-line reservoirs can have significant impacts on performance improvements of operational management of irrigation systems. To this end, good coordination between inlet and outlet structures as well as downstream demands should be provided. Under the condition that control and management of the reservoir is done with good coordination with other sectors, the flow in the canal would be more stable. This leads to decrease in the water level fluctuations and better services to water users. Reservoir operation and management investigation requires applying hydrodynamic models. In this study, hydrodynamic model of ICSS was adopted for modelling the flow in the regulating reservoir of Moghan Irrigation Network. Eight operational scenarios for entrance hydrograph to the canal system were considered, which consisted of gradual and sudden decreasing of inflow for two status of (i) non operation and (ii) with reservoir operation. Similar scenarios were assessed for the increasing mode as well. The results indicate that response time of the system and stability of water delivery improve by applying reservoir operation. In the decreasing scenarios, the adequacy indicator improves, while in the increasing ones, the efficiency indicator of water delivery increases when the reservoir is operated. According to the results, the latter improvement for the main off-take was obtained as 0.45% and 6.75% for, respectively, adequacy and stability.

Keywords: Storage reservoirs; Main irrigation canal; Unsteady flow.

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