

Improvement in water use efficiency through canal automation under PMKSY-AIBP ERM project at Narayanpur Left Bank Canal Karnataka

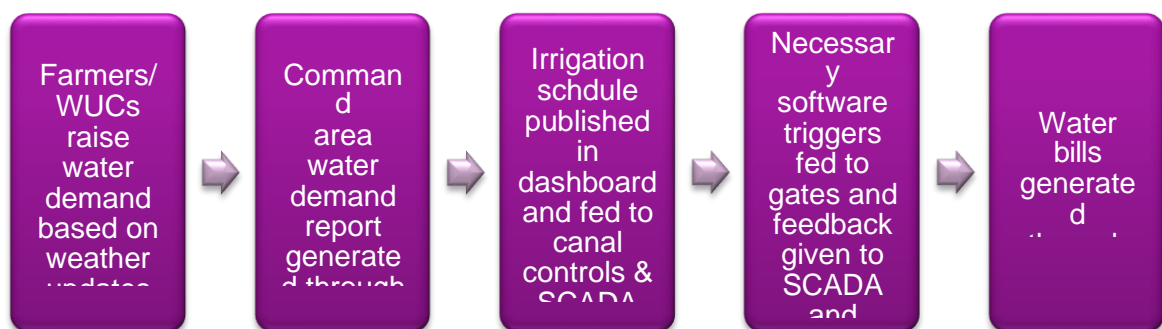
Problem statement: The Narayanpur Left Bank Canal system in Karnataka was suffering from various system deficiencies – it was operating at 31.75% WUE (water use efficiency) against the designed efficiency of 51%; water shortages were being recorded in 1,05,632 Ha of tail end villages and 37,000 ha area reported water logging and salinity issues. Some of the key contributing factors were high seepages in unlined portions of canals, pooling owing to excessive siltation, canal breeches and damages in sluices and gates leading to water-logging incidences, unauthorized water withdrawal and violation of rotational/ warabandi schedule affecting water supply at tail ends, absence of any water regulatory system and rampant violation of the cropping pattern and over-irrigation leading to salinity and absence of adequate operators for canal maintenance and operation.

Intervention: The Krishna Bhagya Jala Nigam Limited (KBJNL) initiated remodelling and automation of the NLBC system along with SCADA implementation and GIS based Irrigation Management Information system (INMIS) to improve the water efficiency. Phase I of the system was launched in 2014 and it was later incorporated under PMKSY – AIBP ERM projects in 2016. As on date, Phase I of SCADA automation and GIS system has been completed while Phase II is in progress. Some of the key projects features are summarized below:

- Implementation of SCADA system: SCADA system software was implemented for monitoring and operation of the automated gates and integration of the system information with the wider information system network.
- Automation of the existing gates: All existing radial gates at CR and HR locations were retrofitted with SCADA based electrical and mechanical fitments comprising water level sensors, remote gate control panels, adequate wireless data communication networks etc. for ensuring automatic flow discharges and metering applications. The automated gates are powered by solar powered system.
- Setting up a hybrid wireless data communication network: Considering huge span of the canal network, a main SCADA centre, data concentrator station and slave stations were set up to ensure hybrid wireless data communication network.

- Establishment of an Irrigation Network Management System (INMIS): An INMIS was set up and integrated with existing systems of KBJNL to ensure seamless data flow between the irrigation management staff and end users. This system controls all information related to water demand and usage and is integrated with the SCADA software for canal water regulation and revenue bill generation.
- Setting up information kiosks for farmers: 210 information kiosks were set up for dissemination of information to farmers in relation to irrigation schedule, weather forecasts, state wide commodity prices, access to other important government links. It also stores details of the farmers along with canal jurisdiction offices, cropping pattern adopted and water demands.

A graphical representation of the modus operandi of the entire system is illustrated below:



Outcome: Automated gate control reduced water losses endemic in manual operations and systematic water allocation and distribution resulted in overall improvement in system efficiency. Water was delivered to the tail end reaches for the first time. Online water demand raising and automatic bill generation facilitated increase in operational efficiency. Improved system responsiveness and dissemination of information improved user experiences. The completion of works is expected to result in improvement in total water use efficiency to the tune of 21.69% - while conveyance efficiency is expected to increase from 60% to 75%, on farm field application efficiency from 53% to 71% and drainage efficiency from 71% to 80%.

Sustainability: To ensure sustainability of the scheme benefits, active involvement of the water users has been initiated through establishment of Facilitation Centres for farmers at Narayanpur and regular conduct of IEC activities in the command area by the

irrigation officials. Interactive information exchange, assurance of demand based supply and performance based disbursements to WUCs are facilitating in generating more interest among the water users.

(Reference: Sidharth Charkha et al (2019)., “Narayanpur Left Bank Canal Automation Project”; documents shared by project authorities during KPMG primary survey; Krishna Bhagya Jala Nigam Limited “Presentation on Improvement in Water Use Efficiency”)