

Automating the Irrigation Census – ensuring data reliability

Problem Statement: Minor Irrigation schemes in India are large in number and the data generated at field level are collected through manual canvassing of paper schedules. As a result, inadvertent delays and errors are experienced during validation and tabulation of data. On account of the massive importance of MI census data in terms of its applicability by various important government agencies like MoWR, CWC, CGWB, Water Resources Departments at State level for framing policies pertaining to appropriate usage of groundwater and rejuvenation of the sources, a need for having web-based application for accuracy and quick processing of data was felt by the MI Staff wing, MoWR. It was understood that adoption of the system may lead to certain advantages like elimination of duplicate entries, timeliness, need based generation of tabulated data and archiving of historical data.

Intervention: National Informatics Centre (NIC) was requested to develop a software, meeting the above-mentioned requirements. The work was adequately taken up by all States and extended to the districts, wherein adequate manpower was appointed for data entry. In the 5th MI census, a web-based software was created for the first time wherein, three different schedules for data entry namely, village schedule, ground water schedule and surface water schedule were introduced. For the 6th MI census and 1st Census of Water Bodies, five schedules viz., village schedule, ground water schedule, surface water schedule, urban schedule and the water body schedule, were incorporated for web-based data entry. The reliability of the data was checked through sample checks by the supervisors. In order to ensure data accuracy, timely tabulation of data and analysis, a software was developed with the following features:

- User friendliness
- Data verification ability
- Modules for data tabulation
- Data dissemination through websites
- Inbuilt models for identifying trends like pattern
- Decision Support System with Query Module

The overall objective of the project was to gather correct data. The databases collected from all States/ UTs have been merged for making a National level database and several reports have been generated. The application has been divided into three modules based on their functionality i.e. Data Entry Module, Abstract Creation and

Decision Support System (DSS). The objective of Data Entry Module is to gather the validated base/enumerated data. Abstract Creation Module will process these data (base/enumerated data) for generating a database that will be used by Decision Support System. DSS Module will generate all types of reports, queries and provide useful information.

Impact: Some of the major impacts noticed due to wide application of the web-based software are as follows:

- Efficient planning and decision making for development of Water Resources through consistent and consolidated information.
- Empowerment of end users to perform in-depth analysis
- Prediction of irrigation potential utilization and segmentation of areas through Online Analytical Processing (OLAP) models.

Replicability: The application documentation can be shared with other sectoral departments. Currently the scope of Irrigation Census is limited to Minor Irrigation only. The modules can be made applicable for medium and micro-irrigation schemes as well. Such an approach will bring majority of the irrigation schemes and their data under single accessibility. This will facilitate coverage of broader issues pertaining to irrigation and will help the policy makers in framing better schemes or revising components of the existing schemes as well.

Sustainability: Such a system can definitely be sustained by enabling strong data archives and archives of the analyses. Introduction of newer modules, software and update of the application on regular basis will ensure easier use of the application. Better analysis through application of Machine Learning techniques will also help the researchers towards analysis of village specific irrigation issues in a detailed manner.

(Reference: KII with DDG, MI Stat wing, DoWR, Govt. of India)