A Case Study on Recent Development in Irrigation Drainage Management in Turkey

IRRIGATION FACILITIES SPATIAL INFORMATION SYSTEM

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Monitoring & evaluation of irrigation projects in technical, social, economic and environmental aspects is one of the most important factors for the success.

Establishing an effective monitoring and evaluation system during the operation phase is important in measuring the expected benefit from irrigation projects.

Performance results of irrigation facilities operated and transferred by DSI are published every year by collecting data from the each organisation taken the responsibility of the irrigation facility.

A new comprehensive software has been developed to make these studies easier.
A digital platform to monitor, evaluate and report the O&M activities of irrigation facilities serves gross 4.6 Mha operated by DSİ and transferred to WUOs.

SUTEM is a kind of management information system that provides the basis for the decision support system.

http://sutem.dsi.gov.tr
BEFORE SUTEM

- Needs of multiple software,
- Loss of time and labor,
- Control and audit problems,
- Data security vulnerability,
- Failure to create standard data structure

for DSİ and WUOs.
Meeting the requirements through a single application

Centralized data security

Saving time and labor

Effective use of external services

Ease of control and inspection

Standardization in reports
DESIGN AND INTEGRATION

Log and Identification Module
Inventory Module
Budget and Accounting Module
Accrual-Collection Module
Irrigation Management Module
Field Operations Module
Maintenance Module
Water User Module
Document Management Module
Communication Module
Audit Module
Purchasing Module
Investment and Expropriation Module
Crop Census Module
Monitoring and Evaluation Module
Report Module
A person has one or more roles.

1. Administration user
   1.1. Headquarters User
   1.2. Regional directorate user

2. WUO user

3. Water user
CENTRALIZATION OF WATER USER DATA

- Water user may also be a member of more than one WUO
- Can monitor all irrigation areas from a single interface
- Can give their irrigation declarations,
- Can follow their measurement of irrigated area after the irrigation season
Irrigation schemes, network data and parcells can be monitored and managed geographically.
Spatial Management with SUTEM

- Relationships between irrigation network data can be defined geographically

- Channel - channel relationship
- Channel - water intake structure relationship
- Parcel - water intake structure relationship

- Irrigation area status (In / out of network)
- Declaration Status
- Status of measurement of irrigated area

- Geographical information can be made on the parcels with thematic maps.
Irrigation declarations can be given by Water User or WUOs in the system.

Irrigation declarations deadlines can be defined on the system.

According to the declarations «General Irrigation Planning» is created by the system in order to define irrigation water needs of the irrigation area.

Water usage protocols can be prepared via the system.
Measurements of irrigated area are carried out in the field by means of tablets only to make water distribution technicians go to the irrigated parcels.

- Mobile devices work offline in the field
- Photo can be integrated in the field
- Measurement operations performed in the field can be viewed on the system.
Satellite images of the irrigation area taken on different dates throughout the year are obtained. The declaration information in SUTEM is entered into artificial intelligence and this information becomes learning data. As a result of a series of analyzes using artificial intelligence, the plant pattern of each parcel is determined in the irrigation area.
Accrual and collection transactions realized as a result of the measurement are accounted through the Accounting System.

- WUAs’ Budgets are prepared according to the «Budget Accounting Guide». Budgets can be sent to the Regional Directorates via «SUTEM» for approval.
- The ratio of budget items to budget is controlled at the approval submission stage, users are warned in case of contradiction and budgets cannot be sent for approval.
- Regional Directorates can return the budget on a pen basis or in full.
- Water User Associations whose budget is not approved cannot carry out any accounting transactions on SUTEM.
- Periodical inspection of the structures can be monitored through the system.
- Records of programmed and actual work items are entered through the system.
- Production results reports can also be received through the system.
COMMUNICATION INFRASTRUCTURE

- WUOs can provide information to water users by using e-mail or short message services by the communication infrastructure.

- WUOs can prepare, archive and make correspondence between documents with this system in electronic environment.
The books published annually will be prepared by the system.

- Budget Reports,
- Irrigation Area and Plant Pattern Reports,
- Accounting, Personal, Accrual Collections and so on.
**DEVELOPMENT NEED OF SUTEM**

- WUA legislation amendment while the software process was going on, necessitated changes in the software that were not foreseen in the ToR.
- "SUTEM Software Development and Data Analysis" under the second component of the Turkey Irrigation Modernization Project (TIMP), carried with the World Bank finance, was tendered in order to meet those needs.
- The contract was signed with NODA Informatics Ltd. on 14.07.2021. The duration of the work is 730 days in total.
- SUTEM Program Implementation Training will be done after the progress in the software.
- After this process SUTEM will be used functionally and widely.
Thank you...

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