

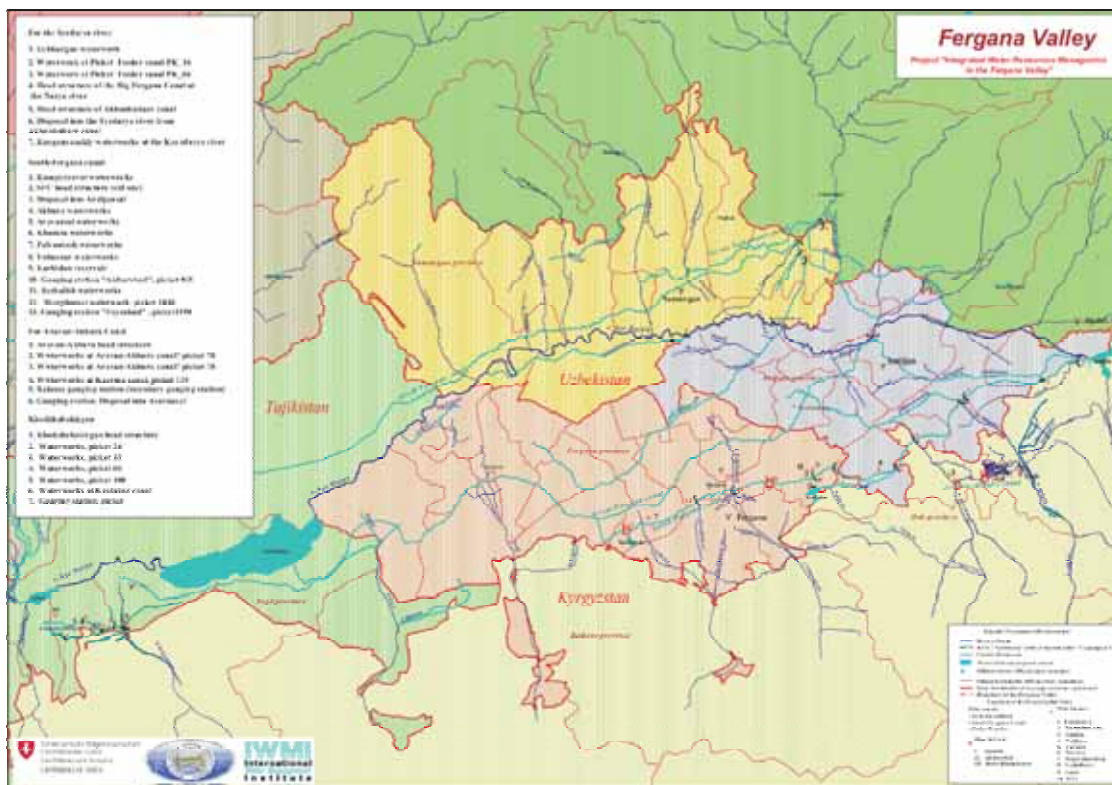
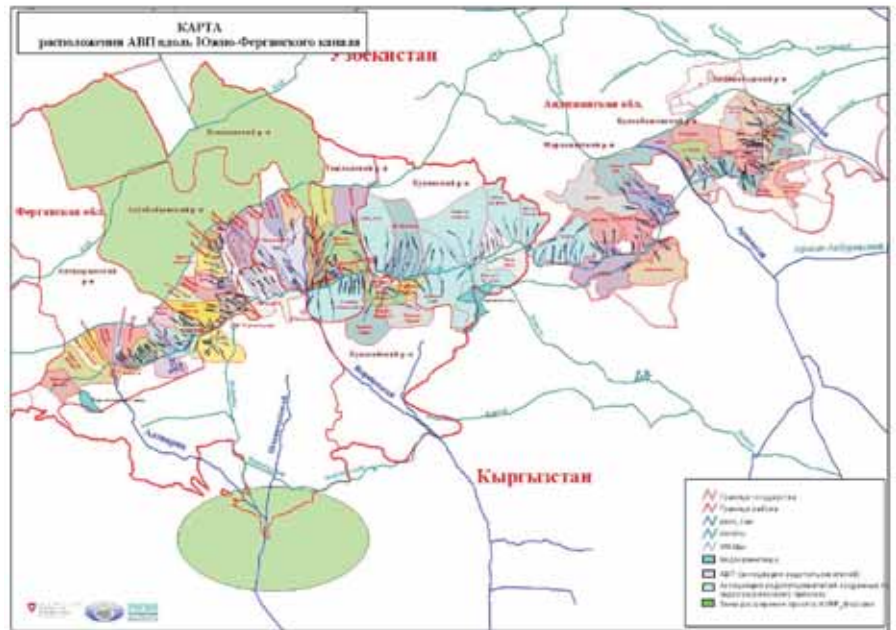
WRM Ferghana

Application of Geographic Information System (GIS)

Geographic Information System (GIS) is state-of-the-art technique in rendition of geographic information being widely applied within the framework of the "IWRM Ferghana" Project for practical purposes. GIS "IWRM Ferghana" contains and makes use of data which describe (along with other information technologies) the earth surface and irrigation systems of the Ferghana Valley; it is designed to facilitate both - researchers' work and efficient natural resources use.

The following results have been accomplished on the basis of GIS-technologies applied within the framework of the "IWRM Ferghana" Project:

- Territory of the Ferghana Valley has been mapped depicting location of three pilot canals – Aravan-Akbura canal (AAC) (Osh province in the Kyrgyz Republic), Hodja-Bakirgan canal (HBC) (Sogd province in the Republic of Tajikistan), South-Ferghana Main canal (SFMC) (Ferghana and Andijan provinces of the Republic of Uzbekistan);
- Each pilot canal's command areas have been defined on the basis of topographic maps and satellite LANDSAT images;
- All Water Users Associations (WUA) are tied to relevant canals and diversions;
- Identified second-order diversions from pilot canals to WUA boundaries and low-order diversions from which water delivery to farms' fields is carried out give complete view of water management systems;
- Through application of thematic layers (soil differences, ground water tables) hydro module areas have been mapped – these being the basis for determining crop irrigation regimes depending on climatic factors;
- To obtain reliable data on farms' fields irrigated within the boundaries of WUA analysis has been made of command areas tied to every diversion.



Scientific-Information Center ICWC

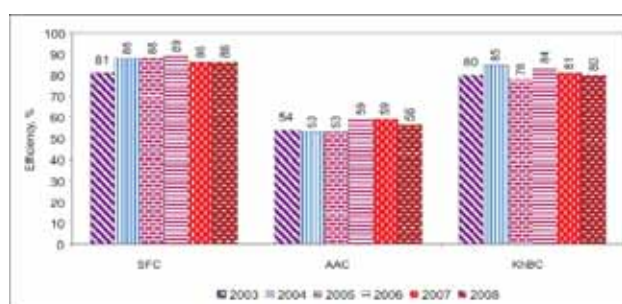
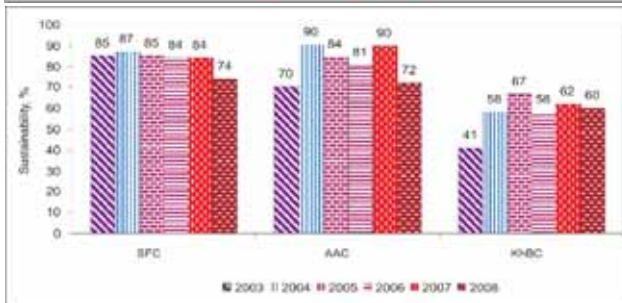
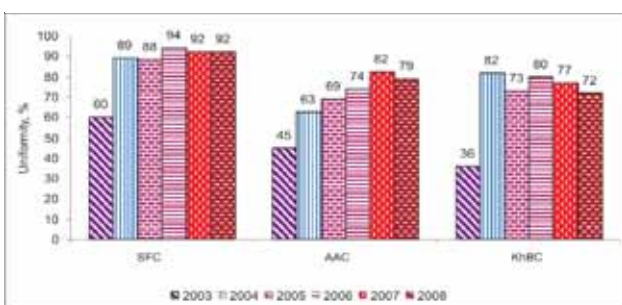
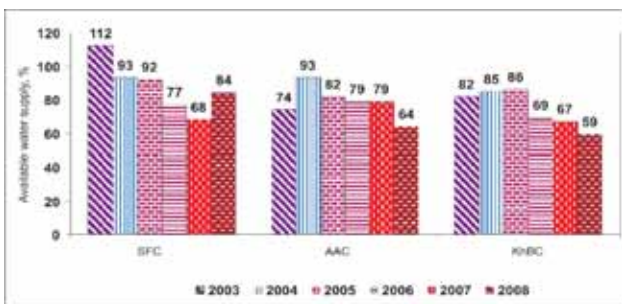
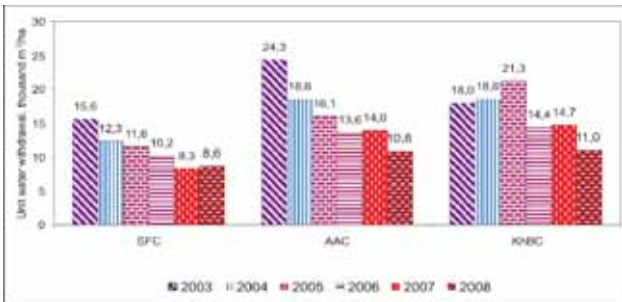
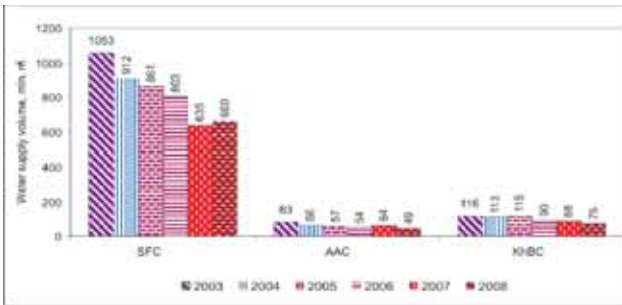
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Management Information-System

“MIS Ferghana”



Multilevel hierarchy of management structure is the basis for IWRM implementation coupled with complex interrelation of all elements. Management structure in the “MIS Ferghana” multipurpose water-resources scheme is supported by mathematical models and information flows generated by Data Base of the information-management System “MIS Ferghana”.

The major objective of the MIS – is the optimal allocation of water resources between participants of the water management system within annual, monthly and decade periods.

The information-management System “IMS Ferghana” enables water managers to accomplish the following goals:

1. Conduct classification of results concerning monitoring of the water management system in terms of:
 - Changes in crop pattern,
 - Changes in hydro model zoning,
 - Changes in water management network (sources, canals),
 - Changes in characteristics of water management network.
2. Carry out assessment of actual water withdrawal by diversions and canals.
3. In conditions of dynamic scheduling to implement modeling of various alternatives of water distribution between water users under different options of demands for decade water delivery and variants of water delivery volumes incoming into the system.
4. Define optimal variants of water distribution:
 - With different sources of water delivery (annual planning),
 - With water resources deficit (annual and operational planning).
5. Conduct analysis of water distribution efficiency:
 - Calculate indicators of water distribution efficiency,
 - Develop reporting and performance documents.

Information System “MIS Ferghana” has been developed on the basis of DB ACCESS and GAMS. The “MIS Ferghana” (version 3.0) is introduced on three pilot canals – Aravan-Akbura canal (AAC) (Osh province in the Kyrgyz Republic), Hodja-Bakirgan canal (HBC) (Sogd province in the Republic of Tajikistan), South-Ferghana Main canal (SFMC) (Ferghana and Andijan provinces of the Republic of Uzbekistan).

Calculations results are reported every decade to Canal Authorities, Canal Water users Unions, Water Committees to make analysis of water distribution and decision making for next decades. On the basis of data summarized by years comparative analysis is made with regard to quality of water management on pilot canals and in WUA.