APPROVED

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Progress Report

First Half Year 2010

Block **"3400 Interactive database development"**

Objective

Development of Database on socio-climatic, water management and climate sectors of Fergana Valley and the Amudarya delta for various territorial levels (WUAs, provinces, states' regions) with aim to implement the specific target tasks.

Purpose

Information Referral system through INTERNET.

Potentialities

Sharing with CAREWIB for analytical tasks solution and researches.

Groups classified on:

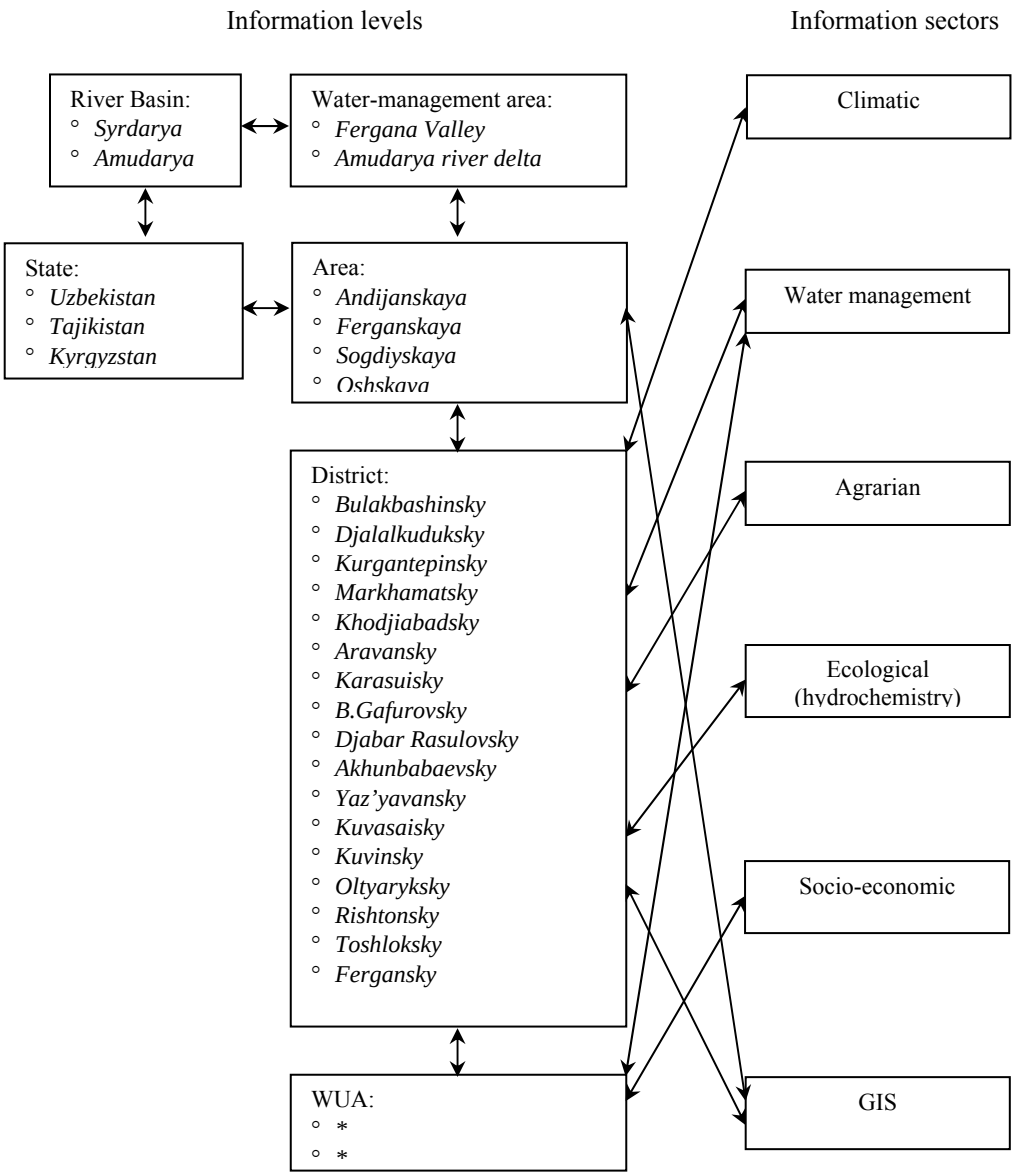
- Territorial levels
- Sectors
- Information types

Work done

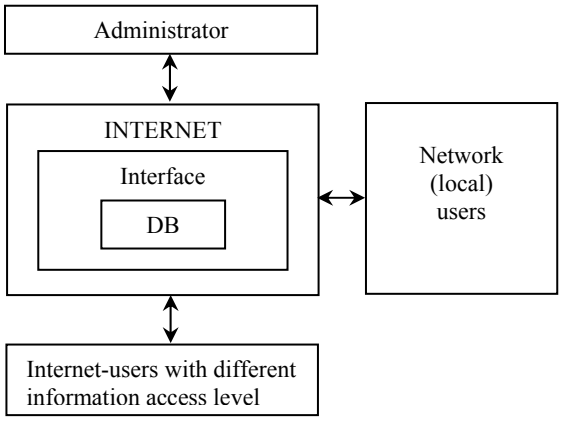
Knowledge domain study: defining indicators on knowledge domains and objects; the database logical structure can be seen by the scheme links of the information classification on levels and sectors.

Data received from the information sources has been systematized - information analysis, input, export into the project on-line DB:

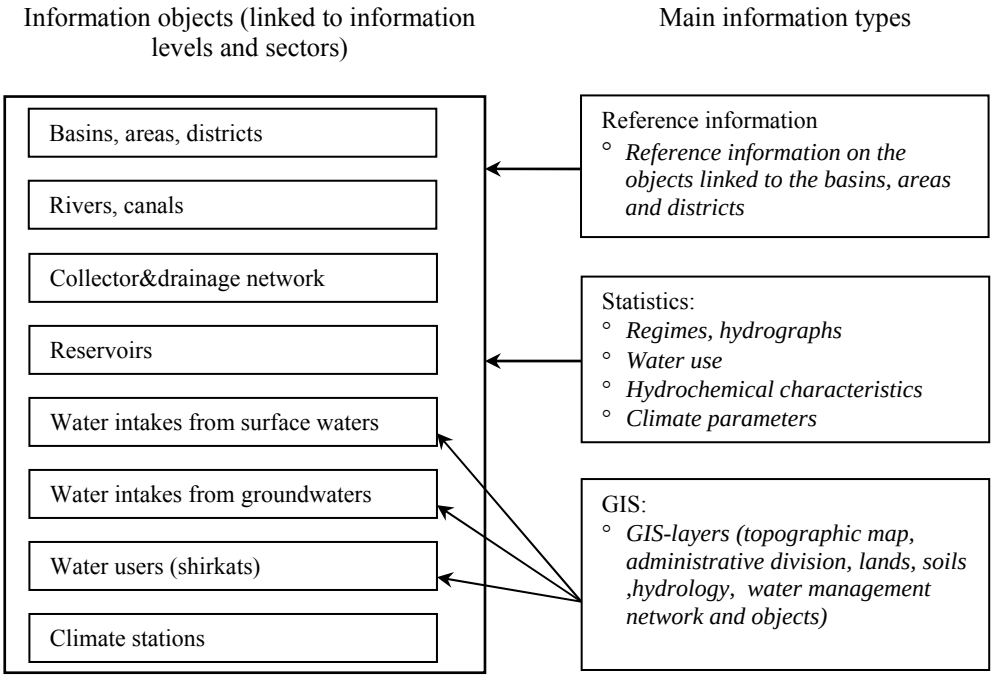
- Reference data (on objects) and on-line data on withdrawals of underground waters and groundwaters (collector&drainage waters);
- Data on soils, projects' results (including GTZ), water use and water disposal, as well the monitoring results;
- Economic and agrarian information of the project;
- Reference and statistical climate information on stations being linked to provinces (minimal, maximal and average air temperature, air humidity, precipitation, wind velocity for 30 years, monthly solar radiation);
- Reference data (on objects) and on-line data on irrigation systems, water consumption (municipal, industrial, agricultural), return flow, results of monitoring.



Software support of database (use of Database management system, on-line interface development) is shown on the Information System scheme.



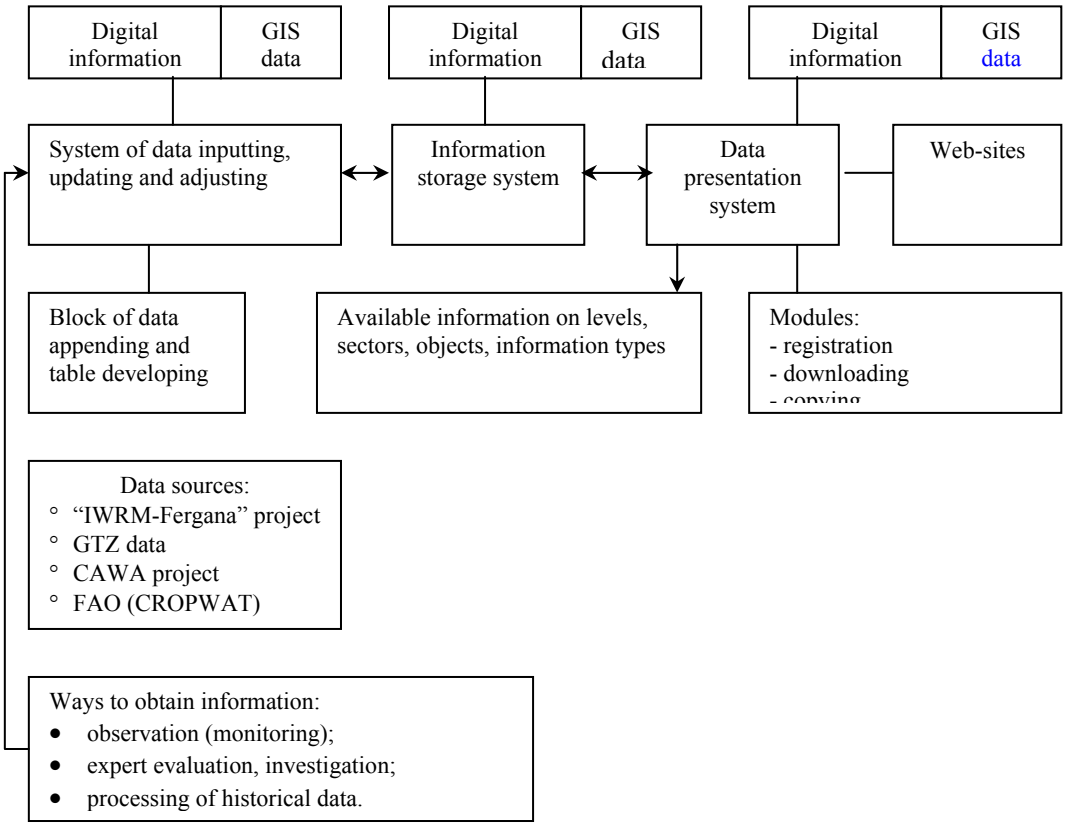
Классификация информации по объектам и типам приведена на приведенной ниже схеме.



The work on formation of the on-line database and interface with access through INTERNET similar to the regional database "CAREWIB" is done as follows:

- The user registration module on the portal as the dynamic registration form and user account in the INTERNET database is developed;
- The user access level module for distribution of the registered users according to the user access type (administrative - full access: data delete/change/correct/save; correspondent - full access to DB on the regional countries; 1st level user - access to reading according to the activated password given by administrator; 2nd level user - viewing the DB information of 2 last years) on the basis of multi-user system with different access for each user is developed;
- The websites (bilingual table forms, user enquiry blocks, diagrams, plots) for the on-line database visualization on the portal through development of the interface between web-based application and the on-line DB are developed;
- The DB backing-up module is developed on the server; the error checking module when using the DB is developed; the system debugging is done;
- The dynamic block of data on the project waterworks facilities, allowing additional tables input and table fields number increase, is developed;
- The download module for a shape file and other files (graphic pictures) on some objects is developed in the administrator control panel.
- The download module for files added by the administrator is developed.

Generalized outline of information flows



Executors have implemented:
- comprehensive analysis of available original information on soils of Priaralie, the dried sea ground and of the Fergana Valley (area linked to the SFC);
- analysis of the project outcomes within the implemented projects - GTZ, "IWRM-Fergana";
- the database basic scheme to save, review, evaluate and analyze available information and to output the final analytical materials on the basis of available information;
- analysis of available initial economic and agrarian information within the "IWRM-Fergana" project;
- comprehensive analysis of available information on water productivity within the "IWRM-Fergana" project;
- the database structure, analysis and assessment of information.

According the abovementioned the work consisted of:
- Evaluation of available initial materials on the study territory;
- Evaluation of available initial materials on the pilot sites of the "IWRM-Fergana" project (2002 - 2007);
- verifying the available information for database in line with the project task requirements;
- development of DB's scheme on soils and groundwaters;

° Elaborating the set of initial (primary) indicators (results of monitoring within the "IWRM-Fergana" project);
° Elaborating the set of the calculated water distribution indicators on the pilot main canals (AAC, KhBC, SFMC);
° Preparing data (measured and calculated) of the water distribution monitoring on the pilot main canals (AAC, KhBC, SFMC) for 2004-2009;

- Collecting data through monitoring of surface waters of the Amudarya delta at three river cross-sections: Takhiatash, Samanbay and Kzyldjar (water discharge, temperature and salinity);
- Collecting data through monitoring of surface waters of the Amudarya delta at the canals: Porlitau, Raushan, Glavmyaso, Kazakhdarya etc. (water discharge and salinity);
- Collecting data through monitoring of surface waters of the Amudarya delta at the collector&drainage networks: GLK, KS-1, KS-3, KS-4 (water discharge and salinity).

Objective information about the size and condition of agricultural lands is needed to manage an agricultural enterprise dealing with crop production. A large volume of spatial and attribute information can be processed and analyzed qualitatively only by means of modern surveying equipment and software with considering of the spatial linking, as well as specific information about the fields. Water demands of irrigated land for water planning and allocation within irrigation system are assessed on the basis of hydromodulus zoning. Hydromodulus zoning (HMZ) is the dividing of territory on the taksonomic units which are characterized by different combination of climatic conditions, soil characteristics, hydrogeological and other natural and irrigation-economic characteristics. Hydromodulus zoning 1986 does not reflect significant changes of natural conditions (climate and especially soil types) occured for last twenty years as well soil types transformation due to groundwater level change, and also land's reclamative condition.
Method for adjustment of hydromodulus unit (HMU) boundaries and irrigation regimes for irrigated land within SFMC'c command area (Southern Fergana Canal, Uzbekistan) on the basis of modern methods of calculating crop water requirements (irrigation and water application rates), as well irrigation schedule on the basis of GIS models has been developed. Irrigation rates for some main crops and each hydromodulus unit were calculated by FAO method (CROPWAT program). Having various thematic GIS-layers for study area (e.g. soil types, groundwater level, climate zone) gives possibility to integrate data by superimposing one layer on another.

According to the Terms of Reference (ToR) the following materials were prepared:
1. The maps of soil types of the Fergana and Andijan areas situated within SFMC'c command area.

FERGANA AREA	ANDIJAN AREA
• Altyaryksky district • Akhunbabaevsky district • Fergansky district • Yaz'yavansky district • Kuvinsky district • Tashlaksky district	• Bulakboshinsky district • Djalalkuduksky district • Kurgantepinsky district • Markhamatsky district • Khodjiobodsky district

The digital maps were developed on the basis of maps of UsGIPROZEM 1:25000.
2. The groundwater level maps of the Fergana and Andijan areas situated within SFMC'c command area were developed on the basis of data (averaged for 5 years - 2001-2005) of Andijansky and Fergansky Basin Irrigation System Authorities (BISA).

3. The maps of hydromodulus units also were developed for the abovementioned areas.

Imposing the above layers allows us to get a map of hydromodulus units of studied fields. This information is used for calculations of water consumption of the WUA's farms. The mapping information was processed by the programs MapBasic within MapINFO environment. Transformation of map data to a digital format was made by the systems ArcView, ArcINFO and MapINFO.