Part 5 – Case Study from Syria

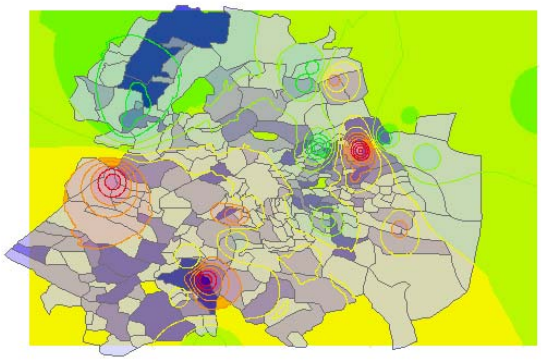
In Syria, a country where the land surface is largely in arid, the area of irrigated agricultural land is increasing as irrigation is essential to increase and stabilize agricultural production. At the same time demand for water is increasing due to population growth, industrialization, and the increase in demand per capita resulting from modernization of lifestyles. With this background of serious water shortage in Syria, reduction of water use in the agricultural field, which constitutes over 80% of the total water use in the country, is one of the most critical problems to be tackled. However, although people recognize the importance and necessity of introducing water saving irrigation technologies, this is not followed by effective water saving actions due to a lack of policies and strategies. This fact led to our intervention to investigate and analyze the current state and limiting factors of water saving irrigation technology extension, and based on the findings, to make concrete recommendations for introduction of water saving irrigation systems. A JICA expert was also dispatched to provide advisory and training services for experimental research, extension activities and policy development to support farmers. In this project we used the GIS to assist in the selection of pilot sites for the introduction of water saving irrigation systems. The GIS was used to investigate a priority sites selection method which considers the water resource situation, the distribution of irrigated lands, and areas with water saving irrigation systems.

A GIS database was created to link statistical data and map information to aid selection of priority areas. The statistical data included cultivation areas per crop per village, total irrigated areas, and the area sizes under drip or sprinkler irrigation, while the map information included an administrative map with village boundaries. Using this database, pilot sites were selected using urgency, necessity and potential as criteria (see table). The maps below are examples of the analytical results. In Map1, the status of underground water levels and different sizes of irrigated areas were overlaid, to show areas with an urgent need for water saving measures. Map 2 indicates areas with a high need for the introduction of water saving irrigation in the future, by choosing areas with large irrigated land and a low rate of water saving irrigation.

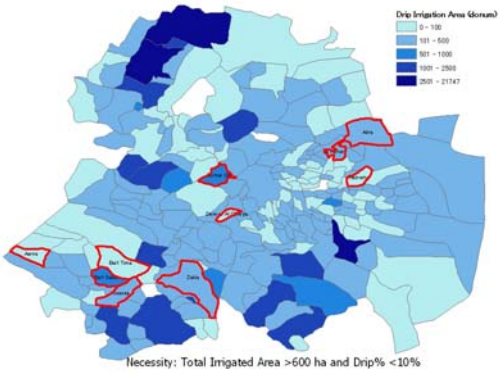
Selection Criteria for Identifying Priority Areas for Water Saving

Selection Criteria	Factors
Urgency Areas with need for urgent measures	Zones rapidly increasing coverage area of irrigated land
	Zones rapidly increasing areas with irrigation using wells
	Zones rapidly lowering underground water table
	Zones with large imbalance of water revenue & expenditure
Necessity Areas in need of water saving irrigation	Zones with low percentage in use of water saving irrigation
	Zones using a large amount of irrigation water (zones with a large irrigated area or with crops with high water needs)
	Zones with large areas with irrigation with wells and with high percentage of well based irrigation (heavy dependency on underground water)
Potential Areas with potential for water saving	Zones with large summer crop areas and with potential for significant water saving
	Zones with large irrigation water use
	Zones with low use of water saving irrigation

What we need to be careful of here is the availability of relevant information used for the GIS database and its accuracy. The data used were from national irrigation situation surveys conducted by the Irrigation Directorate and agricultural production data of extension offices overseen by the Agricultural Extension Directorate. The biggest difficulty was the lack of accurate information, and even when information was available, it was often either inaccurate or incomplete (e.g. data was available in some areas but not in others). The initial purpose of the GIS database was to use it as a tool for selecting priority sites for introducing water saving irrigation systems. However, there is a danger of creating erroneous results if analysis is made with inaccurate information. Therefore when the accuracy of obtainable data is low, it is considered that it is more appropriate to grasp general trends in the area as a whole, rather than pin pointing small areas. Accurate and beneficial analysis is possible if there is a large amount of accurate information. However, GIS can produce beautiful maps with all sorts of data, and there is a danger of "results" walking away in disguise as good-looking maps. When using GIS, we need to understand that qualitative and quantitative improvement and accumulation of data are key for effective use of GIS. In addition, it is important that data accumulation and improvement can be done in the same section using the GIS data. While developing this GIS database, we reaffirmed the essential importance of diligent and accurate data accumulation at the backstage of apparently splendid map outputs.



Map 1. Urgency: Overlay of information on lowering groundwater saving irrigation technology introduction



Map 2. Necessity: Areas with a large irrigated land and low rate of water and irrigated areas