

**Summary and Extended Abstract of the Water Sector in Jordan
ESA-EMWIS, Remote Sensing Workshop
27-28 September, 2010, Rome
Mohammad R. Almomani
Ministry of Water and Irrigation,**

Introduction

Water scarcity in Jordan is becoming the most vital issues that need sustainable solutions and managements.. Within the region, the per capita consumption varies significantly from country to country. Jordan is located in arid and semi arid environment where more than 90% of the country receive less than 200mm of annual precipitation. Highly variable seasonal rainfall is the main source for groundwater recharge in Jordan. Resources are already seriously limited and are far below under the water poverty line. The per capita availability of renewable water today is less than 145 m³/a.

Thus, as a consequence of the over-exploitation of the resources, a decline in groundwater levels as well as a decrease in baseflow and spring discharge are observed all over the country.

Return flows from irrigation caused groundwater quality degradation in some areas, either in relation to (EC) or nitrate (NO₃) content due to agricultural inputs as fertilizers and to the dissolution processes between water and rock matrix.

Many actions have been taken in order to remedy the situation; these include:

- Formulation of adequate policies and strategies
- Legal amendments to better control and reduce groundwater abstractions.
- Improved water resources monitoring.
- Strategic planning & management; including the development of a comprehensive water information system.
- Regional Cooperation.

Water Strategy and Policies:

Jordan's water crisis has been developing over several decades and was influenced by many factors such as limited natural resources, influxes of refugees, One of several steps taken for reforming Jordan's water management system was the formulation of water strategy and policies in (1997 and 2009). In addition, four water policies were developed (water utility, irrigation water, groundwater management and wastewater management, also water demand management policy). The water policies aim at development of the water resource, its protection, management and measures needed to bring the annual abstractions to the sustainable rates.

Advantages of the support:

Development in new tools and techniques of remote sensing, and introduction the remote sensing in water land use activities.

Human resources development and capacity building of MWI, WAJ & JVA, Royal Jordanian Geographic Center (RJGC) and other entities in advanced remote sensing and radar satellite applications and the interrelationship on data processing, evaluation.

Space based remote sensing techniques developed could enable the collection of accurate water data. Such data can easily be turned into information through maps and graphs of irrigated areas, irrigation requirements as well as water consumption that allow stakeholders and water managers to take better, more informed decisions. Providing a compilation of past, current and future water conditions.

Possibility of cooperation and data sharing on a regional basis, and applications would include coordinated management of shared water resources and trans-boundary water, depending on a request within a regional program.

To find reliable tools and approaches in determination of the right areas for protection of the existing fresh water resources from deterioration.

Cooperation among counterparts:

The Ministry of Water and Irrigation (MWI) and the two entities of Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA), having an integrated management either for water use and water allocation for different purposes, also cooperate with other stakeholders mainly in land use activities. The other component is that the Water Information System (WIS), at the (MWI) and data flow mechanism is essential on that. The Jordan Royal Geographic Center (JRGC) is considered as one of the partners and stakeholders of the water sector.

RJGC has recently witnessed a great progress in qualifying the technical staff and personal as well as in providing the Center with up-to-date technology regarding equipment, the Center has also upgraded all the software to different applications in the field of orthophotos, satellite images, photography and printing.

National Water Master Plan:

The primary objective of a Water Master Plan is to establish a basic framework for:

- Orderly and integrated planning and implementation of water resources programs and projects; and
- A rational water resources management consistent with overall national socio-economic development objectives.

Possible Requirements:

Improving the availability of timely, relevant, accurate and actionable **information to senior decision makers** in the water sector has the potential to produce large benefits through improved planning and decision – making and easier oversight of sector performance.

Training and capacity building related to remote sensing in water issues could be summarized as follows:

Remote sensing and radar satellite could be integrated with GIS and thematic mapping.

- **Groundwater and surface water studies.**
- **Vulnerability mapping and hazardous of groundwater contamination**
- **Groundwater protection zones for wells, well fields and springs.**
- **Water resources protection of springs, reservoirs and wadis**
- **Land use activities as (irrigation, industrial,...etc.).**