

Action fiche for Jordan

1. IDENTIFICATION

Title	Improved Water Resources Security for Low Income Rural and Urban Communities
Total Cost	EU contribution: EUR 10 million
Aid/Method of Implementation	Centralised Management
DAC-code	14030 Basic drinking water supply 14015 Water resources protection

2. RATIONALE

2.1. Sector context

Jordan has very limited water resources. In 2007 demand exceeded renewable resources by 75%. Groundwater resources are overexploited with 60% excess extraction in relation to the natural replenishment capabilities. The yield and water quality of aquifers are therefore endangered. Annual per capita water availability is 145 m³ per year (which is far below the international water-poverty line of 1000 m³/year) and dropping continuously. Increased water demand is evident in all rural and urban areas resulting from population growth, and economic development. The increasing water deficit poses a serious future threat that will impact on all sectors of the economy. A serious effort has to be made at all levels to balance available resources and demands. Water tariffs are currently set too low to provide for effective incentive to stimulate water savings by users or support operational cost recovery of the services.

The proposed programme is in line with the Country Strategy Paper 2007-2013 and the National Indicative Programme, which supported the provision of improved services throughout the water cycle, provision of fresh water, desalinisation, and distribution and treatment, and includes a focus on the efficient use of treated water and increasing the awareness of the population on water scarcity issues in order to encourage more efficient water usage.

The proposed programme is fully in line with the goals of the Jordan's Water Strategy 2008-2022, which foresees the involvement of water users in decisions regarding a more efficient water demand management. The Strategy and its preliminary Action Plan sets goals for water demand management; water supply; institutional reforms; improvement of irrigation water management; wastewater management; and alternative water resources.

The proposed programme approach is in line with the Water Sector Reforms under implementation. Presently the Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA) are responsible for all water supply and irrigation systems respectively, but these agencies will become bulk suppliers with the management of distribution systems at the regional level. Smaller companies: Public Water Companies for water supply and Water Users' Associations for irrigation. The establishment of a Water Regulatory Commission (WRC) is expected during 2011. However, as the increasing scarcity of water remains, intermittent water supply and rationing is expected to continue as means of regulating water supply.

The Yarmouk River Basin is shared between Syria and Jordan. Three quarters of the 7250 km² of the basin are situated in Syria, one quarter in Jordan in the north-west corner of the country, including the cities of Irbid and Mafraq. Although data on the Syrian part of the basin are scarce and do not allow a precise analysis, renewable groundwater resources in the basin can be estimated at roughly 230 million m³ per year.

As is the case in most of the highland and desert areas in Jordan, groundwater resources in the Yarmouk river basin are heavily overexploited. The estimated safe yield of the aquifer in the basin is approximately 40 million m³ per year, but actual extraction is close to 63 million m³ per year - of which more than 50 million m³ for irrigation. This over-abstraction leads to a severe drawdown of the groundwater table and is negatively impacting groundwater quality from the resulting salt water intrusion from deeper aquifers.

The irrigation areas in the Jordan Valley are divided in two parts: the northern part receiving fresh water from the Yarmouk River and side wadis and the southern part receiving water from King Talal Dam. In the past the Yarmouk River was delivering approximately two thirds of the fresh water resources in the years 1995-1998. The average total flow (base and flood together) in the Yarmouk River decreased from approximately 8 m³/s in the 1960s to 2 m³/s at present. In 2006 and 2007 the Yarmouk River delivered approximately 15 million m³ to the King Abdullah Canal, compared with 100 million m³ in 1995-1998. As a result, citrus harvest has suffered large losses in quantity and in quality.

To compensate for the loss of Yarmouk river water, the Jordan Valley authority built the Zarqa Carrier III, which enables another 4000 ha to be irrigated with water from King Talal Dam, alternating fresh water supply. However, water from the carrier contains sediments which are detrimental for the operation and maintenance of on-farm drip irrigation systems and their physical quality needs to be improved through additional filtration.

2.2. Lessons learned

The recently completed EU MEDA Water Programme has successfully worked on issues of wastewater reuse in irrigation, irrigation water efficiency, rainwater harvesting, grey water reuse at household level and water user participation. The experience demonstrates that working on both the demand and supply sides of a sector is both

relevant and effective in influencing behaviour in water use. The households are very receptive to the possibilities of reducing their water demand and water costs (by accessing alternative water sources, i.e. from roof catchments).

GTZ has carried out extensive field studies on the political economy of water demand. This fieldwork indicates that there are deep divides in water and sanitation provision between the poor households and the more wealthy households. Low income groups suffer from water scarcity during the summer months when the piped network delivers water irregularly, whereas the wealthier households can afford to install adequate storage capacity and purchase water delivered by privately-owned water tankers and safe bottled water for drinking purposes. The costs of these supplementary water supplies can amount to more than ten times the monthly bills of piped water from WAJ and this has a high impact on the amount of water used and the associated health risks to low income families.

Many attempts have been made by the government to reduce groundwater abstraction by introducing limiting measures such as a moratorium on the drilling of wells, instating abstraction limits and enforcement by metering, and pricing mechanisms (the last two through the new groundwater Bylaw of 2002). However, all these measures have had little effect; at best groundwater abstraction has remained constant over the last 7-8 years. Licensing and limiting groundwater abstraction by force has not been applied with enough vigour and various studies report that the negative financial incentive, to be effective should be at least 10 times higher, which would put small farmers out of business and completely change the agro-socioeconomic structure of the region (and is therefore politically not a viable option). The solution for the over-abstraction may lay therefore in a combination of enforcement by the Government of Jordan (GoJ) as clearly mentioned in the 2009 Water Strategy and at the same time providing information to farmers that the current situation is unsustainable and will destroy their livelihoods.

Attempts were made by GoJ in the past to establish groundwater models for the aquifers of the basin. None of the models are operational and are not well documented either. Despite that, it is believed that modelling can play an important role in the management of groundwater resources as it can make what-if scenarios visible for water users and decision-makers alike and contribute to consensus. However, in order to do this, more modern modelling approaches with integrated surface water-groundwater models using decision support tools need to be developed.

As models built for the Jordanian part of the Yarmouk basin can be relatively easily extended for the Syrian part as well, the modelling exercise would in the long run enable an integrated management of water resources as required among others by IWRM principles and the European Union Water Framework Directive (WFD). With expected upcoming urbanisation and industrial development and the complex administrative situation of a shared international river basin, WFD principles perfectly apply to the Yarmouk basin and could be introduced in any actions.

The main lesson learned for the improvement of irrigation water management is that it needs a holistic approach in which all aspects of farming, irrigation management, marketing, cropping pattern, cultivation methods, fertilisation, financing are considered.

USAID has been working on setting-up an Irrigation Advisory Service for the Jordan Valley. The programme focuses on the improvement of marketing and financing issues and the transfer of technology to the farmers.

GTZ implemented projects in the Jordan Valley, which led to increased know-how of the farmers on using marginal water resources, particularly in the southern part of the Jordan Valley.

In the framework of the MEDA Water Programme, the Improvement of Irrigation Water Management Project (IRWA) worked on improvement of water quality and on-farm integrated water and fertilisation management. It was proven that even in farms with drip irrigation and greenhouses, water savings are possible between 20 and 30%. However, despite all efforts in the past, inadequate irrigation advisory services makes scaling up of such results difficult. Another useful lesson of IRWA is that working in irrigation areas where water user associations have been formed eases the communication with the farmers.

2.3. Complementary actions

Yarmouk River basin: GTZ is starting up the Highland Water Forum, which will be put in place to enable dialogue between the different water users on the Highlands (which extend also to the Yarmouk basin area) and the water authorities that are responsible for resources management. Those actions can be complemented by the EU with activities that are specifically directed towards the particular situation in that basin, but fully integrated in the actions of GTZ.

Moreover, CIM/GTZ is supporting the Ministry of Water and Irrigation (MoWI) in putting in place integrated Water Evaluation Planning System (WEAP) decision support systems and MODFLOW groundwater modelling for the Zarqa and Yarmouk basins. However, the work in the Yarmouk basin has only just started and remains limited because of lack of funds. It does not couple surface and groundwater models and does not include a socioeconomic modelling component. The EU contribution can greatly enhance the foreseen modelling in the Yarmouk Basin.

Irrigation water: GTZ has two projects in the Jordan Valley which are extensions of projects that exist for a longer time, the Marginal Water Project and the Water User Association Project. Both projects are limited in size and comprise only a restricted number of field activities at the moment, but the expertise collected can be used.

2.4. Donor Coordination

Policy orientations of the Government to address the pressing issues of the water sector have received a strong support from the donor community. Key donors in the sector

include the US (USAID, MCC), Germany (GTZ, KfW and BGR), the EU, Japan (JICA), Korea, with other donors such as France (AFD and PROPARCO), China or Spain (AECID) more recently implied or expressing interest.

The need for reinforced coordination within the donor community and with the Government has been acknowledged. A coordination forum under the UNDP umbrella, with The Ministry of Planning and International Cooperation (MoPIC) and MoWI involvement, currently chaired by AFD holds regular (currently every three months) meetings.

The proposed programme requires coordination with different donors. Drinking water supply for poor communities requires coordination with KfW, JICA, MMC and GTZ, groundwater management in the Yarmouk basin requires coordination with IFAD, BGR and GTZ, wastewater reuse in the Northern Jordan Valley requires coordination with AFD and GTZ.

3. DESCRIPTION

3.1. Objectives

The overall objective of the programme is to contribute to improved water resources security for drinking water supply and irrigation, in particular for low income urban and rural communities in Jordan.

The programme intends to assist the water sector stakeholders to enhance mitigation and adaptation to the increasing water scarcity in Jordan, which may be further augmented by the impact of the global warming and climate change. It aims to support effective co-operation of water users in executing strategic government's objectives related to efficient management and conservation of water resources.

The Specific Objectives of the Programme Components are:

- (a) Household water users in selected low income areas where piped supplies are irregular and /or do not exist have enhanced security for their supplies;
- (b) Sustainable tools and methodology have been developed for the GoJ and local water users that can be used to reduce over-extraction of groundwater resources in the Yarmouk river basin; and
- (c) Farmers in the Northern Jordan Valley are enabled to adapt more effectively to alternative irrigation water resources including treated wastewater and desalinated brackish water.

3.2. Expected Results and main Activities

Component A

Result 1.1 - A programme has been established for the improvement of water supply in selected pilot areas: Select up to three pilot WAJ piped networks and at least one pilot non piped served area in small, low income areas that are representative of water security issues in the urban and rural sectors.

Result 1.2 - Participatory management has been established in the pilot areas: Establish cooperation procedures between local WAJ and user-groups.

Result 1.3 - Rehabilitate and complement piped supply with alternative measures to improve water supply: Rehabilitation of the existing piped networks and for a non served area inside selected pilot areas.

Result 1.4: Stakeholders in the pilot areas are better informed about the ways to improve efficient water use through communication and user association approaches to ensure sustainability: Prepare and implement a communication and visibility plan involving water awareness unit in WAJ.

Component B

Result 2.1: A decision support tool based on a combination of Water Evaluation Planning System (WEAP) and MODFLOW simulation models has been developed, including water management, agricultural management and socio-economic modules : Set-up and calibrate a combined WEAP and MODFLOW decision support model for the Yarmouk basin, including studying options for coupling the model to the Syrian part of the catchment.

Result 2.2: A river basin council with representation of all water users has been set-up and its actions have been integrated with the Highland Water Forum: Set-up a River Basin Management Committee, build its capacity and integrate in the activities of the Highland Water Forum, enabling a joint learning process.

Result 2.3: Water conservation measures demonstrated and implemented on pilot farms and results extended: Select and establish pilot farms on water and soil conservation (i.e. terracing, conservation organic material, rainwater harvesting, crop diversification, more efficient irrigation systems).

Result 2.4: The stakeholders in the basin are better informed how to reduce stress on water resources: Prepare and implement communication and visibility plan.

Component C

Result 3.1: Obtain scenarios for the future available water resources in the Northern part of the Jordan Valley and for their proper use and exploitation with a focus on increased

use of alternative water resources: Assess future availability of different water resources (also in the light of expected climate change impact on availability of water resources).

Result 3.2: Enhance quality of the water coming from Zarqa carrier III: Study options and implement measures for this purpose.

Result 3.3: Select a pilot area and develop brackish water resources through desalination: Carry out hydro-geological survey for well location and capacity and construct production wells.

Result 3.4: Demonstrate good practices in the pilot area, using alternative water resources and methods of fertilisation, and disseminate and scale-up results: Implement a pilot project for experimenting with alternate water supply, blending and fertilisation.

Result 3.5: The stakeholders in the basin are better informed about water resources issues and ways of solving stress on these resources: Support GTZ activities in upgrading water user associations and networking of Water User Associations.

3.3. Risks and Assumptions

Safe drinking water supplies to low income areas: Water sector pilot projects in other countries have shown that initiatives involving communities work well when there has been adequate social preparation and time to build trust between people. The main risk lies therefore in the relatively short time frame of the intervention. It is necessary to plan and implement adequate follow up measures for the period after the present intervention.

Yarmouk Basin: To have a lasting success from the proposed measures, the key assumption is that water users understand how over-exploitation will negatively affect their own resources and are willing to associate with fellow-farmers to pursue common interest. The project will need to work intensively with the water users to enhance this understanding and involve them frequently in other project activities (modelling, etc.) as well.

Moreover, it is important that farmers are willing to change agricultural practices. The complete agricultural extension process of action research, demonstration and dissemination of good practices plays a very important role in this acceptance and should be implemented with all possible vigour. Socio-economic factors (economic incentives) are crucial as well and should be sufficiently taken into account.

Another risk is that MoWI does not sufficiently involve farmers in authoritative exercises as modelling and does not sufficiently share the results of this exercise with the water users. From the start of the programme, a networking system needs to be set up that enhances stakeholders' communication in the basin.

Irrigation water: The main risk is that not sufficient water resources are available for irrigation at all, as was the case in 2007 and 2008. Even though this risk is partly

mitigated by the increased availability of treated wastewater, it can not be completely excluded. In case it happens, the project needs to adapt its activities to this situation and make best use from it as a special case drought scenario to be investigated.

3.4. Cross-cutting Issues

Poverty reduction: The aim of the pilot projects in Component A is to ensure that the restructured and rehabilitated water resource systems address the health and social needs of the poor and do not burden them financially.

Climate Change: Predictions for Jordan are univocal with a 2 degree increase in temperature expected for 2050, except for the Jordan valley where increased aerosols may temper temperature increases. For rainfall, predictions are equivocal; 2 out of 3 tested climate change models predict slight increases of rainfall, only one predicts a decrease.

Gender: The Programme promotes gender equity as it deals with issues that affect particularly girls and women, of families without access to adequate and safe water - an issue which directly burdens women by the increase in the volume of domestic tasks and the loss of opportunities to engage in income generation activities.

3.5. Stakeholders

The main formal Beneficiary will be the Ministry of Water and Irrigation, who, through the implementation of the programme, will be able to contribute to goals mentioned in the 2009 Water Strategy. Other stakeholders include: Water Authority of Jordan will be enabled to better serve the low-income population with adequate drinking water supply. JVA will be enabled to better serve the farmer population with bulk supply of alternative sources of irrigation water and in enhancing sustainability of the co-management with the community and water user associations.

Except for aforementioned stakeholders, the Programme plans to involve local partners such as local public organizations (for pilot actions and irrigation advisory services) and local NGOs (for social pilot actions in drinking water supply and irrigation). Their implication in the Programme will enhance their capacity to implement similar tasks in future and improve sustainability of closer links between the top government and bottom community levels.

4. IMPLEMENTATION ISSUES

4.1. Method of implementation

The MoWI has been identified as appropriate leading entity, sharing the steering function of the programme with the sector operational agencies (JVA and WAJ) as well as the Ministry of Agriculture (MoA). The programme intends to address operational level issues which are important for effective implementation of the water strategy and

foresees activities using *action research* methods that are for important parts outside of the normal scope of activities of MoWI, WAJ and JVA.

Direct centralised implementation procedures: Specialised technical support services (TSS) will be established and contracted by the EU Delegation under a Service Contract to support the MWI in implementation of the programme, with responsibility for the planning, daily management and the overall implementation of the Programme including: the supervision of all components; the preparation of tenders for works and supplies for the parts that are implemented under the *direct centralised* approach; support to the EU Delegation in relevant tendering procedures; delivering technical assistance for Components B and C; and the interaction with the beneficiaries through the Steering Committee (SC) and the Technical Committee (TC).

Indirect centralised implementation procedures: Under the *indirect centralised* method of implementation specific areas of the Programme will be assigned by the EU to the GTZ through a separate delegated cooperation agreement with the EU. This will include the implementation of the Service tasks of Component A, and smaller parts of Components B and C. The delegation to GTZ will create an optimal situation in which the activities of the Programme will be fully integrated with ongoing GTZ activities, the relevant capacities of the GTZ already employed in Jordan will be utilised, and the experience of GTZ will flow fully into the implementation of the Programme. This will avoid inefficient expenditure of EU and member states funding and is in line with the EU Code of Conduct on Division of labour in Development Policy. The rules and procedures of GTZ have been assessed under Article 56 (1) of Financial Regulation.

Organisation: The technical support services will carry out its tasks in close consultation with the respective beneficiaries. For this purpose, a Steering Committee (SC) of max 7 persons will be established. The Ministry of Planning and International Co-operation, the Ministry of Water and Irrigation (chair), the Water Authority of Jordan, the Jordan Valley Authority and the EU Delegation in Jordan will be members of the SC. The technical support services will ensure the Secretariat of the Steering Committee. The GTZ will have an observer function in the SC.

4.2. Procurement and Grant Award Procedures

All contracts implementing the action must be awarded and implemented in accordance with the procedures and standard documents laid down and published by the Commission for the implementation of external operations, in force at the time of the launch of the procedure in question.

The EU Delegation in Amman will manage centrally contracts estimated at the total indicative value of EUR 6,400,000 which will conclude service, works and supply. The contracts in the Programme will be implemented by the EU Delegation as appropriate with the support of the TSS.

The EU will sign a special delegated cooperation agreement with GTZ for an indicative value of EUR 3,600,000.

4.3. Budget and Calendar

The operational implementation period of this programme is estimated at 36 months.

Indicative Budget Breakdown (in EUR)

Indicative Total Budget	10,000,000
I. Centralised management by the EU	5,800,000
1. Technical Support Services (management support and technical assistance)	2,700,000
2. Communication and visibility	500,000
3. Works and supplies	2,400,000
4. Monitoring, Evaluation and Audit	200,000
II. Indirect centralized management (by GTZ)	3,600,000
III. Contingencies	600,000

4.4. Performance Monitoring

Day-to-day technical and financial monitoring will be a continuous process as part of the responsibilities of the technical support services. Three monthly progress reporting is required. Where tasks are assigned to partners, those partners will report in the same way to the technical support services.

Independent consultants recruited directly by the Commission on specifically established terms of reference will carry out external monitoring according to the ROM system.

The implementation of the Programme will be subject to field supervision and follow-up by the EU Delegation.

4.5. Evaluation and Audit

The EU will carry out a final evaluation of the programme. The EU may also carry out a mid-term evaluation if deemed necessary. Both evaluations will be carried out by independent consultants recruited directly by the Commission under specific Terms of Reference.

4.6. Communication and Visibility

As part of the Inception Report the technical support services will, in consultation with Steering and Technical Committees as well as other partners, prepare a *Communication and Visibility Plan*.

In its actions, the Programme will abide strictly by the Visibility Guidelines of the European Commission (http://ec.europa.eu/europeaid/work/visibility/index_en.htm).