



**STRATEGY PAPER FOR THE
PRIORITY AREA WATER
OF THE
GERMAN-JORDANIAN DEVELOPMENT
COOPERATION
2011 - 2015**

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Abbreviations

ACWUA	Arab Countries Water Utilities Association
BMZ	Bundesministerium fuer wirtschaftliche Entwicklung und Zusammenarbeit German Federal Ministry for Economic Development and Cooperation
BGR	Bundesanstalt fuer Geowissenschaften und Rohstoffe German Federal Agency for Geo-Sciences and Natural Ressources
CAPEX	Capital Expenditures
CIM	Centrum fuer Internationale Migration Centre for International Migration
DED	Deutscher Entwicklungsdienst German Development Service
EFQM	European Foundation for Quality Management
EIB	European Investment Bank
EC	European Commission
FC	Financial Cooperation
GDP	Gross domestic product
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit GmbH German Technical Cooperation
ha	hectare
IWRM	Integrated Water Resources Management
JD	Jordanian Dinar
JICA	Japanese International Cooperation Agency
JOHUD	Jordan Hashemite Fund for Human Development
JVA	Jordan Valley Authority
KAC	King Abdullah Canal

KfW	Kreditanstalt fuer Wiederaufbau German Development Bank
KOICA	Korean International Cooperation Agency
lpcd	litre per capita and day
MCC	Millennium Challenge Cooperation
MCM	Million cubic meter
MoA	Ministry of Agriculture
MoEnv	Ministry of Environment
MoM	Ministry of Municipalities
MWI	Ministry of Water and Irrigation
NGO	Non-Governmental Agency
NRW	Non-revenue water
OPEX	Operational expenditures
SIDA	Swedish Internal Development Agency
SSP	Sektor Schwerpunkt Papier Priority Are Strategy Paper
TC	Technical Cooperation
UNDP	United Nations Development Programme
WAJ	Water Authority of Jordan
WHO	World Health Organization

1. Summary

1.1. Water is a limiting factor in Jordan's development efforts. Natural factors such as arid to semiarid climate as well as demographic changes (caused also by migration intake), socio-economic growth and the subsequent intensification of irrigated agriculture are all aspects that strain a sustainable management of scarce water resources in the country.

1.2. The National Water Strategy "Water for Life" (2008-2022) represents the ongoing efforts and commitment of the Jordanian Government in establishing a system of policies and reforms that accommodate and find solutions to these impeding factors.

1.3. In consultation with key members of the donor community, the German Government supports the implementation of the National Water Strategy. Germany's contribution consists of complementary interventions, which take the form of financial (KfW), technical cooperation in the strict sense (BGR, GTZ, InWEnt) and technical cooperation in the broad sense (CIM, DED) support.

1.4. The objective of the German-Jordanian Cooperation is to support the implementation of the Jordanian Water Strategy with focus on economic efficiency, ecological sustainability and social justice while fostering regional dialogue. To this end, the present priority area strategy paper identifies and defines objectives and indicators and a general framework, within which this objective can be realised.

2. General situation and National Strategy

2.1 General situation

2.1.1 General situation of the priority area

2.1.1.1. Jordan's water availability ranks among the lowest in the world. Current water demand levels lead to a severe overuse of Jordan's renewable ground water resources and an exploitation of fossil groundwater. This is exacerbated by the inefficient and uncontrolled use of scarce water resources and lacking protecting measures. Demographic expansion, migratory influxes due to regional socio-political unrest and economic growth have increased water use and demand. On top of that, Jordan's agriculture consumes 2/3 of Jordan's water resources, which is disproportionally high when compared to its contribution of 3% to the national GDP. This can lead to a conflict in the use of water for drinking, agricultural irrigation or industrial purposes.

2.1.1.2. In addition to decreasing groundwater resources, the water quality has been suffering from insufficient wastewater collection and treatment systems and poor waste management systems. In order to avoid health hazards, wastewater treatment as well as groundwater well management systems need to be strengthened and improved. Having said this, the connection rate, both in the water supply and wastewater sector, is high and in line with the population increase. However, there remains space for improvement in the water distribution services, both in terms of service quality and water quantity, especially regarding sanitation. Special attention should be shifted towards measures that prevent poorer populations from having to use expensive water delivered by tankers. Successful investment schemes and technical assistance have led to a considerable reduction in water losses. However, more should be done in order to avoid negative effects on production costs, the environment and water service quality.

Water supply is comparably costly not only due to remaining high non-revenue water (NRW), but also due to substantial energy costs arising from the necessity to pump water over long distances and heights. Continuing on this line, while water prices are not at the lowest end in regional comparison, they are not sufficient to cover real costs either, leaving water utilities with financial deficits. Although Jordanian water utilities are already achieving good results concerning cost-coverage ratios in regional comparisons, the Jordanian ratios are decreasing and not all utilities are able to cover their operation and maintenance costs. In order to be able to tackle these issues, institutions and its personnel need to be strengthened. Furthermore, local structures should be strengthened in order to increase accountability.

2.1.2 The National Water Strategy

2.1.2.1. In order to tackle the above mentioned problems in the water sector, the Jordanian Government has developed a strategy that revolves around a more efficient use of existing water resources, a more just water distribution as well as cost efficient supply/use of the resource. These objectives find their momentum in the National Water Strategy "Water for Life" 2008-2022. The Water Strategy was conducted in a participatory approach including close consultations with the donor community.

2.1.2.2. The newly enforced Jordanian Water Strategy identifies clear priority areas, which are based on a clear definition of the needs of the Jordanian population. The strategy comprises six thematic fields, which include; water demand, water supply, institutional reform, water for irrigation, wastewater and alternative water sources (see annex 2). In this context, the strategy addresses issues that have proven to be important in previous Jordanian-German experiences and interventions in the water sector. These issues concern, amongst others, water loss reduction, cost effectiveness in the water services, institutional reform with the creation of independent water utilities, water resource management and protection, sustainable groundwater extraction in the highlands as well as more efficient irrigation methods.

2.2 Main potentials and challenges

2.2.1 Main potentials

The National Water Strategy provides a well-structured and forward thinking framework for interventions in the Jordanian water sector. It provides guidance on how to direct implementation of measures into the right direction by addressing key issues the water sector is confronted with. In order to consolidate this guidance, the Jordanian government is in the process of elaborating a new water legislation, which amongst others sets the frame for a comprehensive Jordanian Water Law and targets a restructuring of public institutions in the Jordanian water sector. The new water legislation will be complementary to the water strategy and thereby contribute to a more comprehensive sector policy framework. This framework is strengthened and underlined by a visible political commitment to the fight against Jordan's water crisis. Continuing on this line, positive results from the long standing development cooperation (such as private sector partnerships, investment programmes in water loss reduction and improved sewage infrastructure, corporatization of public water companies and establishment of water user groups) form a sound basis for a continued cooperation.

2.2.2 Main challenges

2.2.2.1. The strategy "Water for Life 2008-2022" addresses all the pressing issues confronting the water sector. Based on this, the challenge is now to set priorities and to identify target levels and relevant indicators for these targets. For example, the new comprehensive water sector framework aims at restructuring public water institutions and thereby creating a more efficient water sector. To this end, a more elaborate definition of roles, responsibilities and tasks of the relevant players and institutions as well as clear time lines need to be outlined and indicator levels defined.

2.2.2.2. The future challenge will be to successfully direct interventions towards visible improvements in people's affordable access to water of acceptable quality and to safeguard water resources, especially groundwater, and their quality. However, political influences, conflicts of interests and limited institutional capacities of key players in the sector (MWI, WAJ, JVA) can hinder implementation of the necessary actions. This situation is aggravated by the brain-drain tendency that has increasingly become visible in the water sector.

2.2.2.3. Finally, a sustainable approach against the current water crisis can only come about if the implementation of the strategy takes into account a wide and just representation of interests and needs related to water demand and supply. This in turn would lead to an active participation of all stakeholders.

3. Donor activities

3.1. In addition to Germany, other donors such as USAID, MCC, JICA and the UNDP also significantly support the Jordanian water sector development. Less active yet also significant players are France, the EC, SIDA, EIB, and KOICA.

3.2. While some donors (EIB, AFD, MCC) support large-scale (supply-oriented) infrastructure projects such as the Disi Project (transfer of fossil groundwater to Amman), the Red-Dead Sea Project (transfer project) or the water supply and wastewater Improvement project in Zarqa, other donors (JICA, KOICA, SIDA, EC, UNDP) concentrate their efforts on smaller scale projects. These include; more efficient water supply, disposal and treatment, efficient national water authorities (JVA, WAJ), efficient irrigated agriculture, implementation of training programmes, integration of climate change concerns and the reduction of water loss/leakages. The USA and France are active in both categories of support, with the USA representing the biggest donor in the water sector. Germany, ranking second volume-wise with its support to the water sector, plays a dominant role in this above mentioned water demand-oriented category.

3.3. The Jordanian water sector could benefit from increased donor coordination in order to ensure the sustainability and more effectiveness of individual interventions. Practical dialogue between these different actors has taken the form of a Donor-Lender-Consultative Group, which meets at a two month interval. The group initially targeted the exchange of technical information and experiences and recently has shifted its efforts towards coordination through the establishment of task forces. In order to increase ownership, the Ministry of Water and Irrigation in coordination with the Ministry of Planning and International Cooperation could initiate a regular "Water Jour Fixe" with all donors and lenders to identify, initiate and coordinate possible collaborations as well as providing a better overview of existing and future actions.

4. The German contribution

4.1. Areas of support and objectives of the German contribution

4.1.1. An Integrated Water Resources Management (IWRM) approach needs to be applied in order to overcome Jordan's multi-faceted water problems. The use of the existing water resources need to be optimized in order to reduce the existing financial burden on the national budget. This burden which is caused by heavy subsidies on water tariffs will be further increased by new infrastructure projects.

4.1.2. The German Development Cooperation will support the water authorities to achieve the King Abdullah Award for Excellence for the Public Sector, which follows the European Foundation for Quality Management (EFQM) principles that were recently established by the Jordanian Government.

4.1.3. Furthermore the German Development Cooperation will consider the promotion of energy efficiency and the use of renewable energy, especially in the Water Sector, on the basis of concrete proposals.

4.1.4. The German contribution will consist in supporting the Jordanian Partners in implementing the Jordanian Water Strategy "Water for Life 2008-2022" in selected areas and in achieving its corresponding objectives. As an enhancement of the SSP 2005-2010 the objective of the German contribution to the Jordanian Water Sector for the period 2011-2015 is therefore stated as follows:

The Jordanian Water Strategy is being implemented with focus on economic efficiency, ecological sustainability and social justice while fostering a regional dialogue.

Output Indicator 1: Adequate water services are provided to the people of Jordan while ensuring the financial sustainability of the water and sanitation providers.

Output Indicator 2: The long-term interests of all stakeholders are considered and balanced during the planning and management of water resources.

Output Indicator 3: Best Practices of Integrated Water Resources Management (IWRM) from the region are shared.

The outcomes of the German contribution and their indicators are shown in annex 1.

4.2. Instruments and levels of support

4.2.1. The German Development Cooperation is funded and coordinated by the German Federal Ministry of Economic Cooperation and Development (BMZ) and covers a wide range of assistance. This includes financial and technical cooperation, provision of experts and training and capacity building measures.

As the focus of the German-Jordanian development cooperation is on the water sector, these instruments are combined in a coherent Water Sector Programme. For its coordination, a Water Sector Coordinator was appointed by BMZ. The Water Sector Programme is implemented by the following German agencies: KfW for financial cooperation and GTZ, BGR, CIM, DED, InWEnt for technical cooperation¹.

4.2.2.a The financial cooperation (FC) provides standard FC loans and development loans for capital investment projects and open programmes (mainly for water loss reduction, improvement of sewage

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KfW Entwicklungsbank - Kreditanstalt für Wiederaufbau (German Development Bank); GTZ – Gesellschaft für Technische Zusammenarbeit GmbH (German Technical Cooperation); BGR – Bundesanstalt für Geowissenschaften und Rohstoffe (Federal Institute for Geosciences and Natural Resources); CIM – Centrum für internationale Migration und Entwicklung (human resource placement organisation for the German Development Cooperation); DED – Deutscher Entwicklungsdienst (German Development Service); InWEnt – Internationale Weiterbildung und Entwicklung gGmbH (Capacity Building International, Germany)

collection and use of reclaimed water for irrigation purposes). Through its grant-funded accompanying measures programmes, the FC also encompasses advisory and management support to the WAJ and water utilities in Amman, in the Northern and Middle Gouvernorates and Kerak.

4.2.2.b The technical cooperation (TC) supports the MWI, WAJ, JVA, MoA and the Royal Department for Environmental Protection in policy and institutional reforms as well as capacity development. This support is enhanced through the integration of TC experts who provide a variety of advisory services at the above mentioned partner structures. On a regional level, the TC promotes dialogue and information-exchanges by supporting the Arab Countries Water Utilities Association (ACWUA) as well as organising workshops, conferences and leadership courses on water governance.

4.2.3 The German Development Cooperation supports activities at all levels of interventions.

- a. At micro-level: strengthening water user associations in the Jordan Valley, financing infrastructure projects with several water utilities, developing a Water Information System for the KAC with JVA, supporting a network of Water Wise Women (volunteers supported by GTZ through the NGO JOHUD) providing personnel assistance for the water utility in Zarqa (DED, CIM, GTZ, KfW).
- b. At meso-level: supporting the improvement of efficiency and service quality of the water utilities in the Northern and Middle Gouvernorates, including the development of water re-use concepts and their implementation (DED, GTZ, KfW).
- c. At macro-level: supporting the sustainable use of groundwater in the Highlands, improving the planning and monitoring of the ministry as well as supporting the ministry in its restructuring process, strengthening the data and information management in the ministry, developing a comprehensive human resources development for the water sector, strengthening the capacity for groundwater management and protection at the ministry (BGR, CIM, DED, GTZ).
- d. At the meta-level: supporting a new water legislation as well as the implementation process of the new water strategy (GTZ).
- e. At a regional level: supporting the regional exchange of best practices amongst water utilities and capacity building with respect to water governance (GTZ, InWEnt).

4.2.4 The German Development Cooperation puts great emphasis on equal opportunities for women and men. Therefore, at micro-level, the water user associations will include female farmers in the decision processes and the Water Wise Women are strengthened in their efforts to be accepted by the water authorities to represent domestic water users. Furthermore, trainings, capacity building as well as human resources development will include gender issues as integral parts of their agenda.

4.2.5 The Jordanian partners for the German Development Cooperation are the Ministry of Water and Irrigation as the political partner of BMZ; the Water Authority of Jordan (WAJ); the water utilities, which are in charge of water supply and sanitation; the Jordan Valley Authority which is in charge of irrigation in the Jordan Valley; the Ministry of Agriculture which supports the farming community in the Highlands; the Jordan Food and Drug Administration, which controls i.e. agricultural products that are irrigated with marginal water, and the NGO JOHUD which supports awareness raising activities in different communities.

5. Dialogue themes for the Priority Area Strategy

Commitment at a political level needs to be expressed on the following issues:

- a. The reinforcement of the transformation process of former regional departments of WAJ into autonomous, client-oriented and efficient utilities (NGWA, Miyahuna, Middle Gouvernorates)
- b. The reform of water tariffs in order to reflect the true costs of water (for domestic and agricultural use), to give clearer incentives for a more rational water allocation and water savings, and to reduce the enormous and increasing amount of subsidies for the sector and indirect subsidies such as those for electricity
- c. The need for groundwater extraction caps and alternative livelihood plans in the highlands.
- d. The implementation of water protection measures, reinforcement of laws and by-laws on water resources protection and the consequences of land use planning and land use licensing
- e. The improved cooperation of all concerned authorities, i.e. MWI, WAJ, JVA, MoA, MoEnv, MoM
- f. The restructuring of WAJ and JVA as bulk water suppliers with clearly defined roles and responsibilities
- g. The establishment of an independent regulatory body for control of WAJ, JVA and water utilities and for the authorization and control of abstraction or discharge
- h. The elaboration of a critical environmental assessment of oil shale extraction and uranium exploitation, with special focus on their impact on water resources
- i. The impact assessment of mega-projects on the financial situation of water utilities and the national financial budget, in order to ensure sustainable and long-term effects.

Annex 1: APPROVED INDICATORS FOR THE STRATEGY PAPER OF THE PRIORITY AREA WATER OF THE GERMAN-JORDANIAN DEVELOPMENT COOPERATION 2011 – 2015

The proposed indicators were discussed during a joint workshop in Amman on 16.11.2010 and subsequently approved by H.E. the Minister of Water and Irrigation on 2.12.2010

GOAL: The Jordanian Water Strategy is being implemented with focus on economic efficiency, ecological sustainability and social justice while fostering a regional dialogue.

- **Output Indicator 1:** Socially balanced water tariffs reflect the true costs of water.
- **Output Indicator 2:** The long-term interests of all stakeholders are considered and balanced during the planning and management of water resources.
- **Output Indicator 3:** Best Practices of Integrated Water Resources Management (IWRM) from the region are shared.

OUTCOME AND PROPOSED INDICATORS OF THE GERMAN CONTRIBUTION:

1. Supply of consumed water of good quality and sufficient quantity is improved in the Northern, Middle Governorates as well as in Amman.

Indicator 1: Delivered drinking water (lpcd) for Amman, Northern and Middle Governorates

Indicator 1 - Baseline:

Year	Amman	Zarqa	Irbid	Mafraq	Jarash	Ajloun	Madaba	Balqa
2009	153	143	95	198	71	78	143	158

Source: Annual Water Authority of Jordan Reports (2009)

Indicator 1 - Target Value-consumed drinking water:

Year	Amman	Zarqa	Irbid	Mafraq	Jarash	Ajloun	Madaba	Balqa
2015	120	100	100	80	80	80	100	100

Source: HE The Minister Policy Note issued in April 2010

Indicator 2: Percentage of all drinking water samples meet WHO criteria (baseline 2009)²

Indicator 2: Baseline

Percent compliance with respect to microbiological parameters (at reservoir or pumping station)

Governorate	% Compliance – Microbiological Parameters				
	2005	2006	2007	2008	2009
Amman	98.9	99.9	98.2	99.9	99.9%
Balqa	98.5	97.6	99.9	98.6	97.1%
Zarqa	97.9	98.3	96.6	98.9	99.2%
Irbid	98.7	98.7	98.0	98.8	99.7%
Mafraq	97.3	98.4	96.9	98.1	98.9%
Madaba	99.0	97.6	97.4	99.2	98.4%
Ajloun	98.7	98.8	97.1	99.0	98.7%
Jarash	99.1	99.0	100.0	100.0	99.7%

Source: Annual Water Authority of Jordan Reports (2006 to 2009)

² The percent compliance of tested samples with respect to microbiological parameters for Amman, Northern and Middle governorates was calculated as 99.3%. The latter percentage significantly exceeds the minimum compliance percentage of 95%, which is specified in the Jordanian Drinking Water Standards, JS286/2008 (JDWS). The table shows the percent compliance per governorate.

Indicator 2 – Target Value (at reservoir or pumping station)

99.5 of all drinking water samples meet WHO criteria

Source: WHO Guidelines for Drinking Water Quality, Third Edition, Vol.1, 2008

2. Legal and institutional framework conditions are in place and reinforced and the planning, steering and monitoring of the water sector is improved

Indicator 3: Water institutions function according to their mandate stipulated in the mandated water legislation and the respective laws are enforced (MoV: Qualitative Report, baseline 2009: not in place)

Indicator 4: Water resources allocation and management is coordinated with all relevant ministries and institutions (MoV: Qualitative Report)

3. Water resources and protection aspects are integrated into land use planning

Indicator 5: Land use plans on municipal level are updated and in place in 2013 which uses current information from the Ministry of Water and Irrigation pertaining to water resources availability, quality and protection.

Indicator 6: Major investment plans are based on environmental impact assessments which integrate the need for water resources protection and preservation of water quality.

4. Water quantity is managed in an integrated and sustainable manner and water resources are protected more effectively

Indicator 7: A roadmap on the management of the aquifers has been developed by all stakeholders and is being implemented in a socially acceptable manner for the Amman-Zarqa and Azraq basins by 2015.

Indicator 8: The groundwater extractions of Amman-Zaraqa and Azraq basins have been reduced by % in 2015 (baseline in 2009).

Indicator 8: Abstractions from Amman-Zarqa and Azraq Basins in 2009

Basin	Safe Yield (MCM/year)	Abstractions (MCM/year)			Deficit (MCM/year)
		Municipal	Irrigation	Total	
Amman-Zarqa	87.5	89.40	64.85	154.25	66.75
Azraq	24	23.66	27.90	51.56	27.56

Source: Jordan's Water Budget, MWI, 2009

Indicator 8: Target Values

Amman-Zarqa Groundwater Basin	2010	2011	2012	2013	2014	2015
Reduction from decrease of free abstraction amount from 150,000 to 100,000 MCM/y	138.8	138.5	138.2	133.1	128.1	123.0
Reduction as a result of increase in tariff	137.6	136.7	135.8	131.0	126.1	121.3
Reduction as a result of renting wells	137.4	136.4	135.4	130.6	125.8	121.0
Reduction as a result of buying wells	133.4	130.4	127.4	123.4	119.4	115.4
Total	129.0	123.8	118.6	115.5	112.4	109.3

Azraq Groundwater Basin	2010	2011	2012	2013	2014	2015
Reduction from decrease of free abstraction amount from 150,000 to 100,000 MCM/y	58.6	58.4	58.2	54.8	51.4	47.9
Reduction as a result of increase in tariff	58.4	58.1	57.8	54.4	51.0	47.7
Reduction as a result of renting wells	57.0	56.0	55.0	51.9	48.8	45.7
Reduction as a result of buying wells	53.0	50.0	47	44.7	42.4	40.1
Total	50.0	45.5	41.0	39.3	37.6	35.9

Source: Groundwater Reduction Plan for Amman-Zarqa and Azraq Basins

Indicator 9: 10 Groundwater Protection Zones are established by 2015 (2009: 6 zones)

5. Adjusted costs for operation and maintenance for drinking water supplies and waste water disposal are fully covered through increase in revenue and reduction in expenses

Indicator 10: Increase of operation and maintenance costs coverage by 10% for the Water Utilities respectively in the Northern Governorates (Yarmouk) and Middle Governorates excluding major external factors such as significant price increases for energy and large scale projects for water production. (Baseline 2009: Northern Governorates/Yarmouk 77%, Middle Governorates (Zarqa, Balqa, Madaba) 74% (OMS P&L Statements.%).

6. NRW losses are reduced

Indicator 11: The Water Utilities in the Northern Governorates have reduced their technical and administrative water losses in 2015 to 37%, in the Middle Governorates to 49%, in Amman to 33% and in Karak to 54%.

7. Marginal water is being used in agriculture, industries and at domestic level in a safe way³

Indicator 12: Land which is being irrigated (ha) with marginal water in the Jordan Valley with no health incident reported.

Indicator 12: Baseline

The area of land in the Jordan Valley irrigated with reclaimed water in 2009 was 17,418.84 ha, compared to an area of 14,624.5 ha in 2008, which represents an increase of 19.1%.

Indicator 12: Target

The target area for 2015 is proposed to be 15% more than the present area, which translates into a total area of 20,031.67 ha.

Indicator 13: 5 % of new industrial and commercial development projects exceeding an area of 50,000m² will have a grey water treatment system (baseline 2009: 0%)

8. Efficiency of water use (agriculture, domestic and industrial) is increased

Indicator 14: Regulations to promote a more efficient use of water in households are elaborated and enforced (baseline 2009) (baseline 2009: not in place)

Indicator 15: Agricultural output in terms of economic return is improved by 10% per unit of water (baseline 2009: 1.247 JD/m³).

9. Regional cooperation is increased

Indicator 16: Regional organisations provide for their national members effective dialogue and training platforms on best practices concerning water supply and good water governance principles in the region on a regular and sustainable base.

ACWUA capacity building working groups, annual best-practice conferences by ACWUA and/or AWC, regional training courses by ACWUA, Arab Water Week are functional and provide demand-oriented services for their national members from government, private sector, and academia, Baseline 2009: 0.

³ The definition of marginal water includes both treated wastewater and brackish water.

Annex 2: Goals of the Jordanian Water Strategy: Water for Life-2009-2022 and the support of the German Development Cooperation for its implementation.

The Jordanian Water Strategy delineates 6 areas of development, i.e. water demand management, water supply, water for irrigation, institutional reform, waste water and alternative water resources with the following objectives, including indications of where the German Development Cooperation supports the achievement of these goals.

Goals for Water Demand by 2022

1. Irrigated agriculture in the highlands will need to be capped and regulated and the by-laws will need to be reinforced. **(GDC contribution)**
2. Appropriate tariffs and incentives will be introduced in order to promote water efficiency in irrigation and higher economic returns for irrigated agricultural products. **(GDC contribution)**
3. Jordanians are well aware of water scarcity and the importance of conserving and protecting our limited water resources. **(GDC contribution)**
4. Viable options to reduce water demand within each sector are readily available.
5. Water tariffs within and outside the water sector should support water demand management. **(GDC contribution)**
6. Non-Revenue water to be 25% by 2022. **(GDC contribution)**

Goals for Water Supply by 2022

1. Uninterrupted safe and secure drinking water supply achieved including continuous flow in Amman, Zarqa, Irbid and Aqaba. **(GDC contribution)**
2. Water supply from desalination is a major source.
3. Drinking water resources are protected from pollution. **(GDC contribution)**
4. Surface water efficiently stored and utilized.
5. Treated wastewater effluent is efficiently stored and cost effectively used. **(GDC contribution)**
6. Groundwater management plans to ensure safe yield are operational. **(GDC contribution)**
7. The concept of utilizing grey water and rainwater is fully embedded in the codes and requirements of buildings. **(GDC contribution)**
8. Our shared water rights are protected.

Goals for Institutional Reform by 2022

1. Water law is enacted and enforced. **(GDC contribution)**
2. Strong policy development and water resource planning strategies and capabilities forged. **(GDC contribution)**
3. Governance functions and operational functions are separated. **(GDC contribution)**
4. "Wholesale" operations (national infrastructure) and "retail" operations are separated. **(GDC contribution)**
5. A Water Council is operational allowing for broad stakeholder input into water management. **(GDC contribution)**
6. A Water Regulatory Commission of Jordan is established. **(GDC contribution)**
7. Commercial principles drive water management while needs of the poor are supported. **(GDC contribution)**
8. Staff are trained, number of staff is optimized, conflicts of interests are eliminated and a dynamic working environment is created that is responsive to the needs of the sector. **(GDC contribution)**
9. The National Water Master Plan is institutionalized. **(GDC contribution)**

Goals for Water for Irrigation by 2022

1. The annual flow for irrigation in the Jordan Valley will be reduced to 661 MCM in 2022 (293 MCM in 2007) and in the Highlands reduced to 191 MCM in 2022 (304 MCM in 2007)
2. Efficient bulk water distribution as well as efficient on-farm irrigation systems are established.
3. All treated wastewater generated will be used for activities that demonstrate the highest financial and social return including irrigation and other non-potable uses. **(GDC contribution)**
4. Jordan will have one service provider for irrigation water for the whole country, whereas the retail function for irrigation water will be privatized and/or handled by empowered farmers' associations. **(GDC contribution)**
5. Appropriate water tariffs and incentives will be introduced in order to promote water efficiency in irrigation and higher economic returns for irrigated agricultural products
6. Alternative technologies such as rainwater harvesting for enhancing water supply will be promoted.

Goals for Wastewater by 2022

1. All the major cities and small towns in Jordan are provided with adequate wastewater collection and treatment facilities. **(GDC contribution)**
2. All major industries and mines have wastewater treatment plants.
3. New high-rise buildings use grey water for internal non drinking purposes. **(GDC contribution)**
4. Public health and the environment, in particular groundwater aquifers, are protected from contaminated wastewater in the areas surrounding wastewater treatment plants. **(GDC contribution)**
5. Treated wastewater is used for activities that provide the highest return to the economy. For irrigation use in the Jordan Valley and in the Highlands, a comprehensive risk management system is in place. **(GDC contribution)**
6. The quality of treated wastewater from all municipal and industrial wastewater treatment plants meets national standard and is monitored regularly. **(GDC contribution)**
7. Tariffs for wastewater collection are rationalized.
8. All treatment plans are operated according to international standards and our manpower is trained accordingly. **(GDC contribution)**

Goals for Alternative Water Resources by 2022

1. Treated wastewater will be used for the activity that provides the highest social and economic return and standards for use in agriculture will be introduced and reinforced. **(GDC contribution)**
2. Desalination projects at the Red Sea are operational.
3. Rainwater harvesting is encouraged and promoted.
4. Infrastructure for desalination of sea and brackish water is sufficient.
5. An alternative energy source to keep the cost of desalination as low as possible is available.

