

KINGDOM OF SAUDI ARABIA

MINISTRY OF WATER AND ELECTRICITY

&

UNITED NATIONS DEVELOPMENT PROGRAM
(UNDP)

*CAPACITY DEVELOPMENT FOR SUSTAINABLE
DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES
IN THE KINGDOM OF SAUDI ARABIA*

Project Document

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Table of Contents

| | |
|--|----|
| SECTION 1 – SITUATION ANALYSIS | 2 |
| 1.1 Current Situation: An Overview | 2 |
| 1.2 Rational and Justification | 4 |
| SECTION 2 – STRATEGY | 5 |
| 2.1 Interfacing with the ongoing Initiatives | 5 |
| 2.2 Key Objectives of the Program | 5 |
| SECTION 3 – RESULT RESOURCES FRAMEWORK – ANNUAL WORK PLAN (2012 – 2016) | 6 |
| SECTION 4 – AWP BUDGET SHEET | 12 |
| 4.1 Phasing of Technical Experts | 12 |
| 4.2 Project Budget | 13 |
| SECTION 5 – MANAGEMENT ARRANGEMENT | 14 |
| 5.1 Institutional Arrangements | 15 |
| 5.2 Implementation Plan | 17 |
| SECTION 6 – MONITORING AND EVALUATION | 18 |
| SECTION 7 – LEGAL CONTEXT | 18 |
| SECTION 8 – MANAGEMENT RISKS & MITIGATION STRATEGY | 19 |
| SIGNATURE PAGE صفحة التوقيعات | 20 |
| Component 1: Water Resources Assessment Monitoring & Protection | 21 |
| Component 2: National Integrated Water Resources Management (IWRM) Plan | 21 |
| Component 3: Water Resources Data Management | 22 |
| Component 4: Human Resources Development & Capacity Development | 22 |
| Component 5: Organizational Restructuring & Public Privatization Partnership | 23 |
| Component 6: Water Quality Monitoring, Protection & Enforcement | 23 |
| Component 7: Climate Change Impacts on Sustainability of Water Resources & Disaster Mitigation | 24 |
| Component 8: Integrated Strategic Program for MDGs Promotion | 24 |
| Component 9: Specific Strategic Projects | 24 |
| Component 10: Water Conservation & Efficient Management | 25 |

SECTION 1 – SITUATION ANALYSIS

1.1 Current Situation: An Overview

The Saudi government made strong commitment to support long term and sustainable development of freshwater resources against challenges of increasing demand, potential water quality deterioration, limited availability and future impacts of climatic change at all levels. To cater the above challenges, the government adopted rational approach to utilize groundwater resources by controlling aquifer development, well licensing and drilling, agriculture policy modification, production of non conventional water resources, fully utilization of surface water resources and effective water conservation and efficient demand management.

The Ministry of Water & Electricity has initiated institutional and governance reforms in water sector to adopt robust, flexible and implementable operation model and redesign the organizational structure to streamline and standardize key work processes (operations) in line with strategic objectives and international best practices to enhance performance efficiencies.

Recently, Ministry of Water & Electricity has implemented very ambitious nationwide water conservation program for efficient use of water which was focused on Water Demand Management (WMD) for domestic and non-domestic customers, organizational restructuring and progressing towards privatization which resulted significant reduction in water consumption. The program included mandatory installation of water saving devices such as constant flow regulators and low capacity flushing toilets; highly efficient sanitation and irrigation equipments, public education and publicity programs on the importance of water conservation; and pricing water to reflect its strategic importance and scarcity value.

Public awareness campaigns have proved to be an effective tool in effecting behavioral changes amongst the public, using different marketing and media tools to spread the message of water conservation. The campaign included production and transmission of many conservation messages via television, radio, and newspapers commercials. It was made sure to renew them as far contents and goals. There were also the use of commercials on big screens and boards on big intersections and plazas.

The government has initiated a comprehensive study to identify and evaluate potential future impacts (if any) as result of climate change on the water resources of the Kingdom and to assess vulnerability and possible adaptive measures with the help of advanced climate research models. The initial results forecasted for increasing temperature during summer in northwestern region while lowest in the south and southwest while highest precipitation increase in summer months in all regions of the Kingdom.

The government formulated a National Flood Management Program to provide the framework for flood prediction, evaluation of flash flooding events, reducing risks and damage prevention and mitigation in close coordination with national and international agencies.

Recently, a legislative framework for sustainable development of water resources has been compiled with Formulation of a new comprehensive Water Act & its Implementing Regulations in the Kingdom. In addition, National Water Strategy, Groundwater by-Laws and Regulations, Wastewater by-laws and Integrated Water Resources Management Plan are also under review process. After completion of Restructuring and Supervisory Process Reengineering Plan, Health and Environmental Strategy Implementation Plan, the Ministry of Water & Electricity (MOWE) will work as regulator of water resources of the Kingdom and will implement and enforce the National Water Act and regulations.

In the water scarce Kingdom of Saudi Arabia, groundwater resources continue to be heavily mined as they represent 57% of a non-renewable supply to satisfy mainly the needs of irrigated agriculture, by far the largest water user (over 85%). Combined, sea water desalination and waste water reuse represent less than 5% of the total supply while the rest (38%) is provided by mostly renewable groundwater and, marginally, by surface water resources.

The Ministry of Water and Electricity (MOWE) has the mandate to manage and protect the water resources of the Kingdom. During last 10 years, MOWE has conducted a number of detailed studies for surface and groundwater resources assessment which were used for long term, sound and sustainable management of water resources. The Ministry has initiated a comprehensive plan for integrated management and long-term sustainable use of the available water resources by reducing extraction levels, efficient water use, and watershed protection through current projects (e.g. water leakage, water demand management). The proposed program will help and address major issues of the water sector and would help in capacity development of ministry staff to solve the present and future problems of vulnerability of water supply to the Kingdom. As a result of recent review of the water sector in the Kingdom, (6) strategic tasks were identified to guide the management of this precious resource:

- (i) consider non-renewable groundwater as a strategic national resource,
- (ii) rationalize and reconcile water supply and water demand, especially in irrigation,
- (iii) increase level of services for potable water supply and sanitation, including private sector participation,
- (iv) need to plan and manage on the basis of solid analytical databases and information systems,
- (v) improve the legal and regulatory framework favoring monitoring, coordination and stakeholder participation and Capacity development and institutional restructuring.

However, Ministry of Water and Electricity requires enhancement of capacities to coordinate sector-wide initiatives, full endorsement and implementation of this agenda and require considerable efforts on part of all stakeholders towards a common water vision. This challenge becomes even more complex in view of the current fragmentation of the water and sanitation sector and of the weakness of national stakeholders in ensuring sustainability of this long-term process.

1.2 Rational and Justification

With a population of more than 27 million, Kingdom of Saudi Arabia faces a number of challenges including growing urbanization which poses great pressure on water and sewage infrastructure and environmental challenges including desertification, potential air and sea pollution and depletion of groundwater aquifers. Earning relatively high annual revenues from natural resources, Saudi Arabia has invested heavily on building and upgrading infrastructure during past few decades, in water and sewage infrastructure, road networks, housing, hospitals, and schools.

UNDP will provide advisory services to strengthen the technical and organizational capacities of MOWE in sustainable development and management of the Kingdom's water resources through continue support for development of comprehensive water resource management plan for the purpose of undertaking strategic and efficient water resources planning and management.

Due to MOWE recent initiatives, efficient water use and governance in the municipal and irrigation subsector, reuse of wastewater and exploitation of shallow aquifers caused significant reduction of groundwater abstractions. However, a set of *corrective measures* towards sustainable use water needs to be formulated. These actions or interventions should simultaneously target to alter the supply side and curtail water demands in various productive sectors. However, to make a transition from the current patterns of groundwater development to sound water management mode, two things must happen. First, there is strong need to strengthen the technical and organizational capacities of the MOWE to deal with the dual challenge of water scarcity and quality, including the need to coordinate sector-wide initiatives. Second, a sound information base covering data on groundwater availability, quality, withdrawal, usages and other socioeconomic variables must be put in place to formulate and implement sound water management policies. Both these requisites call for sustained long-term effort, especially since the MOWE has limited capacity base. It needs to go a long way in terms of development and strengthening its technical capacities in order to be able to meet its mandates. This program has been designed to initiate a systematic process of capacity development to help in sustainable development and management water resources of the Kingdom.

SECTION 2 – STRATEGY

2.1 Interfacing with the ongoing Initiatives

The present project builds upon the work that has either been completed or currently being undertaken by the MOWE, especially in relation to the formulation of national water strategy and preparation of water sector plan. Given the urgency of the situation, it aims at complementing these efforts in realizing the national water management goals and objectives, focusing on three of the strategic choices (iv, v, and vi) mentioned in section 1 above. While recognizing the need to avoid duplication of efforts, it will contribute towards maximizing the impact of all proposed interventions. As a matter of fact, this project will initiate a capacity development process that will gradually contribute to the technical and professional growth and development of the MOWE, and will enable it to steer the process of integrated water resources management. For this very reason, it will establish effective coordination mechanisms with the work on the development of national water strategy and action plan. Moreover, it will ensure coordination with other relevant water sector activities implemented by other ministries and development partners. Similarly, in its formulation it will attend to the recommendations emerging from the studies carried out under the auspices of a preceding UNDP project as well as other available studies.

2.2 Key Objectives of the Program

Key objectives of this project are:

- a) Strengthening the technical and organizational capacities of the MOWE in sustainable development and management of Kingdom's water resources;
- b) Develop comprehensive evaluation of water resources (surface and groundwater) in terms of recharge, springs, groundwater, surface water, treated wastewater and desalinated water.
- c) Develop integrated water resources strategic plans (IWRM) for sustainable development of available water resources for domestic, agricultural and industrial users
- d) Develop working plan to assess and evaluate the impacts of over-exploitation, climatic change, and potential seawater intrusion and groundwater pollutions.
- e) Supporting the progressive development of a comprehensive groundwater information management center for undertaking strategic water resources planning and management.
- f) Water resources assessment, monitoring and evaluation for sustainable management.
- g) Develop and strengthen efficient water administration and enforcement.



SECTION 3 - RESULT RESOURCES FRAMEWORK - ANNUAL WORK PLAN (2012 - 2016)

Component 1: Water Resource Assessment, Monitoring and Protection

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | Responsible Partner | Budget Description | Planned Budget (US \$) |
|---|--|------------|------|------|------|--|--|------------------------|
| | | 2012 | 2013 | 2014 | 2015 | | | |
| <p>1.1. Intended Output - Comprehensive evaluation for National Water resource Use</p> <p>Baseline: A detailed water resource studies for a number of aquifers were carried out and evaluated.</p> <p>Indicators: Periodical comprehensive assessment of National Water resource use for municipal, industrial and agricultural sub-sectors.</p> | 1.1.1 Evaluate and update water resource estimates and provide optimal plan for water allocation plan for the Kingdom. | | | | | Ministry of Water and Electricity (MOWE) | International Consultants Satellite images Field surveys- Monitoring contracts Workshops, Seminars, Training Courses | 400,000 |
| | 1.1.2 To estimate agricultural water demand of Kingdom through remote sensing & GIS techniques | | | | | | | |
| | 1.1.3 To estimate water withdrawals for potable water supply and withdrawals for industries and agriculture. | | | | | | | |
| | 1.1.4 Capacity building (Organizing seminars, workshops and training courses on water resource assessment) | | | | | | | |
| <p>1.2. Intended Output - National Water Resources Monitoring & Evaluation Program & Delineation of Protection Zones</p> <p>Baseline: Data were collected for a large number of wells during the detailed water resources studies and entered in to Ministry database</p> <p>Indicators: Develop National Water Resource Monitoring program and develop Well field Protection zones</p> | 1.2.1 Prepare detailed work plan regarding monitoring parameters (water level, salinity etc), and for periodic monitoring and sampling | | | | | Ministry of Water and Electricity (MOWE) | International Consultants Field survey- Monitoring contracts International Consultants Workshops, Seminars, Training Courses | 500,000 |
| | 1.2.2 Review of existing monitoring and sampling program and conduct additional monitoring surveys | | | | | | | |
| | 1.2.3 To forecast potential water supply shortages and determine mitigation measures to maintain existing groundwater supplies. | | | | | | | |
| | 1.2.4 Organize seminars, workshops & training courses on water resources monitoring. | | | | | | | |



Component 2: Development of National Integrated Water Resources Management (IWRM) Plan

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | Planned Budget (US \$) | |
|---|---|------------|--------|--------|--------|--|--------------|
| | | Year 1 | Year 2 | Year 3 | Year 4 | Budget Description | Total Amount |
| 2.1. Intended Output: - Develop National Integrated Water Resources Management (IWRM) Plan for long term sustainable development and management Baseline: National Water Strategy of the year 2009 recommends National IWRM as an important component for oong term plan Indicators: Plans to implement IWRM to the Saudi regions were developed after the consultation of all stakeholder. Also, plans were developed for Monitoring and evaluation Mechanism | 2.1.1 Prepare National IWRM Plan to integrate strategies and programs for surface, groundwater, desalinated & wastewater reuse, and formulate measures to efficient use of water resources. | | | | | International consultant | 669,000 |
| | 2.1.2 Prepare work plans for stakeholders consultations and implementation of IWRM by them | | | | | Ministry of Water and Electricity (MOWE) | |
| | 2.1.3 Organize Seminars, workshops and training courses for MOVE staff and stakeholders to implement IWRM | | | | | Workshops, Seminars, Training Courses | |

Component 3: Water Resources Data Management

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | Planned Budget (US \$) | |
|---|--|------------|--------|--------|--------|---------------------------------------|--------------|
| | | Year 1 | Year 2 | Year 3 | Year 4 | Budget Description | Total Amount |
| 3.1. Intended Output: - Upgrade Water Resources Information Center Baseline: Water Resources Information Center exists but needs to be upgraded. Indicators: Water Resources Information Center will become a focal point of water resources information and tool for future planning of water sector. | 3.1.1 Upgrade WRC design with new hardwares & softwares for large data acquisition and processing from monitoring network and MOVE directorates. | | | | | Equipment | 1,020,000 |
| | 3.1.2 Integration of decision support system (DSS) with databases & develop protocols for detailed analysis, mapping and reporting. | | | | | International consultant | |
| | 3.1.3 Expand GIS operations to support policy analysis, load groundwater and hydrological models for future planning. | | | | | International consultant | |
| | 3.1.4 Organize seminars, workshops and training courses on data loading, interfacing and reporting about water resources management Planning. | | | | | Workshops, Seminars, Training Courses | |

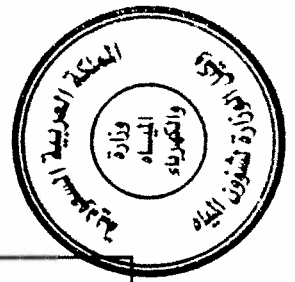


Component 4: Human Resource Development and Capacity Building in Water Resource Planning and Management

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | Planned Budget (US \$) | |
|--|---|------------|--------|--------|--------|--------------------------|--------------|
| | | Year 1 | Year 2 | Year 3 | Year 4 | Budget Description | Total Amount |
| <p>4.1.1 Intended Output: - Prepare Annual plans & strategies for Human Resources Development.</p> <p>Baselines: There is no long term program for human resources development.</p> <p>Indicators: MOWE staff will conduct technical studies related with water resources monitoring and management</p> | <p>4.1.1 Prepare annual training programs; organize field visits to relevant national and international institutes to learn best practices for water resource management.</p> <p>4.1.2 Organize training courses on preparation of tender documents and application of regulatory system and supervision of studies.</p> <p>4.1.3 Training of MOWE staff on advanced modeling and on-job trainings, on-line workshops and study visits.</p> | | | | | International consultant | 430,000 |

Component 5: Institutional Restructuring of MOWE & Public-Private Partnership Enhancement.

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | Planned Budget (US \$) | |
|---|--|------------|--------|--------|--------|--------------------------|--------------|
| | | Year 1 | Year 2 | Year 3 | Year 4 | Budget Description | Total Amount |
| <p>5.1 Intended Output: - Prepare Action Plan to Supervise institutional restructuring of MOWE & to prepare Implementation Plan for Public Private Partnership (PPP)</p> <p>Baselines: The plan for Institutional restructuring of MOWE has been finalized.</p> <p>Indicators: Successful implementation of WSRLA Plan and follow up of MOWE PPP projects.</p> | <p>5.1 To supervise Institutional Restructuring Program executions of MOWE.</p> <p>5.1.2 Formulate action plan for establishment of Water Services Regulation & Licenses Authority (WSRLA), develop regulatory and licensing system, and to prepare work plans for training of MOWE staff.</p> <p>5.1.3 To supervise Public Private Partnership (PPP) activities and to prepare Terms of Reference (TORs) of PPP projects.</p> <p>5.1.4 Organize seminars, workshops and training courses on public-private partnership concepts and strategy.</p> | | | | | International consultant | 370,000 |

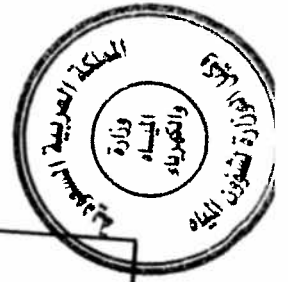


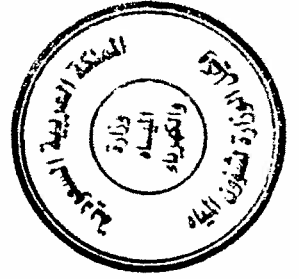
Component 6: Water Quality Monitoring, Protection & Enforcement

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | Responsible Partner | Planned Budget (US \$) | |
|--|---|------------|--|--------------------------|--------------|
| | | | | Budget Description | Total Amount |
| <p>Key Intended Output - Development plans and Strategies for Water Quality Monitoring & Regulatory Systems</p> <p>Baseline: Executive Bylaws for wastewater treatment and Reuse are developed, Preliminary protection zone for groundwater are determined.</p> <p>Indicators: Development of regulations for Wastewater Treatment & Reuse.</p> | 6.1.1 Establish and update standards guidelines and regulations for wastewater treatment and reuse in agricultural, industries and recreational purposes. | | Ministry of Water and Electricity (MOWE) | International Consultant | 340,000 |
| | 6.1.2 Develop action plan for institutional restructure and establishment of regulatory organization for wastewater treatment & reuse | | | | |
| | 6.1.3 Delimitate and monitor groundwater Resources Protection Zones. | | | | |
| | 6.1.4 Organize seminars, workshops and training courses on wastewater treatment and reuse. | | | | |

Component 7: Climate Change effects on Sustainability of Water Resources

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | Responsible Partner | Planned Budget (US \$) | |
|---|--|------------|--|--------------------------|--------------|
| | | | | Budget Description | Total Amount |
| <p>Key Intended Output - Detailed synthesis of vulnerability of water resources due to climate change & development of systems to predict natural disasters</p> <p>Baseline: Detailed future climate change impacts study have been Organized in 2005 using climate model.</p> <p>Indicators: Adoption of Climate Change impacts Mitigations in National sustainable Water Resources Management plan</p> | 7.1.1 Evaluation of regional and local climatic model results to assess and predict climatic changes effects on water resources. | | Ministry of Water and Electricity (MOWE) | International Consultant | 300,000 |
| | 7.1.2 Develop plan to mitigate Natural disaster related to water resources. | | | | |
| | 7.1.3 Organize seminars, workshops and training courses on Climate change prediction and mitigation of natural disasters. | | | | |





Annex 8: Develop Comprehensive Strategic Program to achieve Millennium Development Goals (MDGs)

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | | | | | | | | | Planned Budget (US \$) | | | |
|---|---|------------|------|------|------|------|------|------|------|------|------|------|------|------------------------|--------------|--|---------|
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Budget Description | Total Amount | | |
| 8.1 Intended Output - Develop in Strategic plan to achieve Millennium Development Goals related to water resources. | 8.1.1 Develop comprehensive Strategic action plan to achieve MDGs related to Water Resources | | | | | | | | | | | | | | | | |
| Baselines: National MDG report was published in 2009. | 8.1.2 Develop strategic plan for MDGs related to water field up to 2015 and to prepare annual reports on progress to achievement of such MDGs | | | | | | | | | | | | | | | | |
| Indicators: MOWE staff will be able to achieve MDGs related to water resources | 8.1.3 Organize seminars, workshops and training courses on MDGs related to water resources | | | | | | | | | | | | | | | | 300,000 |

Component 9: Specific Strategic Projects

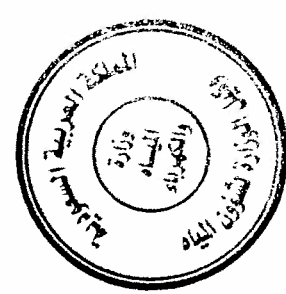
| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | | | | | | | | | Planned Budget (US \$) | | | |
|---|--|------------|------|------|------|------|------|------|------|------|------|------|------|------------------------|--------------|--|---------|
| | | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Budget Description | Total Amount | | |
| 9.1 Intended Output - To conduct specific detailed hydrogeological investigations & training of MOWE staff in groundwater and Modeling. | 9.1.1 Carry out operational efficiency analysis of existing dams and identify new dam sites | | | | | | | | | | | | | | | | |
| Baselines: Detailed water resources studies for several aqifers within the K.S.A were conducted | 9.1.2 Carry out limited studies of local aquifers to evaluate aquifer potential and safe yield. | | | | | | | | | | | | | | | | |
| Indicators: MOWE staff will be able to carry out detailed water resources studies and groundwater modeling. | 9.1.3 Organize seminars, workshops and training courses on advanced Hydrogeological Modeling techniques | | | | | | | | | | | | | | | | 670,631 |
| | 9.2.1 Review and supervise groundwater flow modeling projects of MOWE | | | | | | | | | | | | | | | | |
| | 9.2.2 Carry out studies to update the models of contaminated and excessive groundwater pumping areas in the Kingdom. | | | | | | | | | | | | | | | | |
| | 9.2.3 Organize seminars, workshops and training courses on advanced Groundwater Modeling techniques to MOWE staff. | | | | | | | | | | | | | | | | 400,000 |



Component 10: Water Conservation & Efficient Supply Management

| Expected Outputs & Monitoring Activities | Key Activities | Time Frame | | | | Responsible Parties | Planned Budget (US \$) | |
|--|---|------------|---------|---------|---------|--------------------------|--|--------------|
| | | Q1-2013 | Q2-2013 | Q3-2013 | Q4-2013 | | Budget Description | Total Amount |
| <p>10.1 Intended Output - Develop action plan for Water Conservation and Management.</p> <p><u>Baseline:</u> MOWE has completed four phases of water rationalization campaign.</p> <p><u>Indicators:</u> Develop and Implement Water Management and conservation plan to achieve the target of unaccounted for water (UFW) to 5% by the year 2026</p> | 10.1.1 Develop comprehensive plan for water management and use of advanced network transmission, as well as development of wastewater collection, treatment and reuse | | | | | International consultant | 500,000 | |
| | 10.1.2 Determine state-of-the-art hardware and software are used in water transmission and distribution facilities. | | | | | | | |
| | 10.1.3 Organize seminars, workshops and training courses on water transmission and distribution techniques. | | | | | | Ministry of Water and Electricity (MOWE) | |
| | 10.1.4 Develop action plan for best practices in water conservation technologies | | | | | | International consultant | 240,000 |
| | 10.1.5 Develop operation plan for enforcement of National Water Conservation Strategy | | | | | | | |
| | 10.1.6 Organize seminars, workshops and training courses on advanced Conservation Techniques | | | | | | Workshops, Seminars, Training Courses | |

WRP – Water Resources Planner, SHG - Senior Hydro-geologist, HCH-WQ – Hydro-geochemist/Water Quality Expert, GM- Groundwater Modeling Expert, WRDD – Water Resource Database Developer; WRE-WDM – Water Resources Economics (Water Demand Management Expert), IOD – Institutional & Organizational Development Expert, ISC- International Short Term Consultant

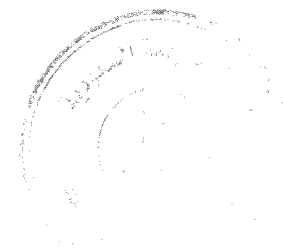


SECTION 4 – AWP BUDGET SHEET

4.1 Phasing of Technical Experts

Given the level of existing capacities within the MOWE, the project has catered for the provision of services of a number of international experts and consultants. Terms of reference (TOR) for the long-term core positions will be part of the full-fledged project document. For each international expert, the technical cooperation agency (UNDP) will submit the names and CVs of three highly qualified experts. These experts will perform three important functions. First, is to facilitate the implementation of planned activities. Second, to provide on-the-job training to national staff assigned to work with them. Third, design and deliver tailor-made training modules to suit the needs of the staff of the MOWE. Experts' performance will be judged based on as to what extent they have contributed effectively towards training of the national staff. International technical assistance will be gradually phased out as per the following schedule.

| International Experts | Year -1 | | | | Year -2 | | | | Year -3 | | | | Year -4 | | | |
|---|--|----|----|----|--|----|----|----|--|----|----|----|---------|----|----|----|
| | 01 | 02 | 03 | 04 | 01 | 02 | 03 | 04 | 01 | 02 | 03 | 04 | 01 | 02 | 03 | 04 |
| Water Resources Planner Expert (WRM) | [Bar spanning from Q1 Year 1 to Q3 Year 4] | | | | | | | | | | | | | | | |
| Senior Hydrogeologist | [Bar spanning from Q1 Year 1 to Q2 Year 2] | | | | | | | | | | | | | | | |
| Groundwater Modeling Expert | [Bar spanning from Q1 Year 1 to Q3 Year 2] | | | | | | | | | | | | | | | |
| Water Resource Database Developer | [Bar spanning from Q1 Year 1 to Q3 Year 2] | | | | | | | | | | | | | | | |
| Water Resources Administrator (Institutional & Organizational Development Expert) | | | | | [Bar spanning from Q3 Year 1 to Q2 Year 3] | | | | | | | | | | | |
| Water Resources Economist (Water Demand Management) | | | | | | | | | [Bar spanning from Q1 Year 3 to Q4 Year 4] | | | | | | | |
| Hydrochemist/Water Quality Expert | | | | | [Bar spanning from Q3 Year 1 to Q2 Year 3] | | | | | | | | | | | |
| International Short-term Consultants | | | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | |



4.2 Project Budget

Total estimated budget for the project is fixed to **\$6,636,558**, including UNDP's overheads and technical backstopping costs. The Technical assistance (experts) will constitute about **37.2%** of the total costs, about **12.9%** of the total costs are earmarked for execution of field studies and surveys, capacity development of MOWE staff will include **16.0%** while equipments and supplies includes **23.5%**. Budget breakdown is provided below.

| Program Budget | | |
|---|------------------|------------------------|
| Long Term International Experts | Duration | Amount in US \$ |
| Water Resources Planner Expert (IWRM) | 38 months | 513,000 |
| Senior Hydrogeologist | 18 months | 243,000 |
| Groundwater Modeling Expert | 18 months | 243,000 |
| Water Resources Database Developer | 18 months | 243,000 |
| Water Resources Economist (Water Demand Management) | 16 months | 216,000 |
| Institutional & Organizational Development Expert | 15 months | 202,500 |
| Hydro chemist/Water Quality Expert | 16 months | 216,000 |
| National Short-term Experts & Consultants (12) | Various duration | 368,000 |
| International Short-term Experts (6) | Various duration | 223,000 |
| Capacity Development of MOWE staff | | 1,063,000 |
| Surveys & Monitoring of Water Resources | | 754,800 |
| Electronic equipments, devices, softwares, | | 1,557,000 |
| Reporting | | 203,231 |
| UNDP - Administrative support (Technical Backstopping) * | | 150,000 |
| UNDP - Audit Fees & (M&E) | | 25,000 |
| In-country Travel related to Field Work | | 100,000 |
| UNDP - (GMS) (5%) | | 316,027 |
| Total Program Costs | | 6,636,558 |

The Technical backstopping is considered as one of the project activities to review studies and reports, support and advice on the smooth implementation of a project. It includes provision of technical guidance and analysis of technical reports as requested by MOWE. The National ownership has always been a key principle for technical backstopping. Therefore, the amount allocated in the budget will be controlled administratively and financially by the Implementing partner (MOWE) and funds will only be expended upon requests by MOWE.

*As usual practice for financial management of the project, UNDP, upon agreement on Annual Work plan with MOWE, will submit a request for the funds to be deposited in UNDP's account under the project. UNDP will only release funds when Requests for Direct Payments are presented by MOWE, indicating satisfactory performance with all necessary details of expenses of above items and services including remunerations, (salaries and field allowances) of experts, administrative expenses and receipts of equipments and supplies for approval. UNDP will also submit quarterly Combined Delivery Reports clarifying details of financial delivery

A summary of the project scope of work of technical assistance in terms of long term and short-term international experts and national experts and consultants is provided below.

| Experts | Number of Experts | Duration (man months) |
|----------------------------------|-------------------|-----------------------|
| International long-term experts | 7 | 15 to 38 |
| International short-term experts | 6 | 1 to 3 |
| National Experts & Consultants | 12 | 4 to 5 |

In addition, the capacity development of MOWE staff will include not more than (15) study tours outside the Kingdom, (20) in-house training sessions and (20) workshops and seminars on various topics and issues as provided in Section-3 Annual Work Plan. All the equipments, devices and software purchased and used will be treated as property of the MOWE and handed over to the MOWE after completion of the project.

SECTION 5 – MANAGEMENT ARRANGEMENT

The project will be nationally executed by the Ministry of Water and Electricity (MOWE). MOWE assumes ultimate responsibility on behalf of the Government for the overall management of project activities, reporting, accounting, monitoring and evaluation of the project and audit of the use of Government cost sharing contribution to the project.

5.1 Institutional Arrangements

Due to the magnitudes of the project size and its diversified technical aspects and responsibilities requirements for the project management arrangements include the following roles;

Project Board: consist of the project coordinator, representative from UNDP, and representative from the Ministry of Foreign Affairs. The main role of the board will be making consensus management decisions for the project when guidance is required by the National Project Director, including recommendation for UNDP/ MOWE approval of project revisions. In order to ensure UNDP's ultimate accountability, final decision making rests with UNDP in accordance with its applicable regulations, rules, policies and procedures. Project reviews by the group are made at designated decision points during the running of the project, or as necessary when raised by the National Project Director. The group is consulted by the National Project Director for decisions when NPD tolerances (normally in terms of time and budget) have been exceeded.

Project Assurance: The Project Assurance role supports to the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. A UNDP representative holds the Project Assurance role.

National Project Director: responsibilities will be associated with the coordination of the different activities with UNDP and international experts. The NPD has the authority to run the project on a day-to-day basis on behalf of the Project Board within the constraints laid down by the Project Board. The National Project Director is responsible for day-to-day management and decision-making for the project. The National Project Director's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The Project Director is appointed by the Ministry of Water & Electricity (Implementing Partner).

Administrative Assistance and Financial Assistance: responsibilities focus on carrying out the administrative and financial support to the project activities including audit, with UNDP and the concerned ministry.

The proposed project will be implemented within the framework of existing institutional structure and associated policy framework so as to be able to contribute further towards its development and strengthening. To facilitate project implementation, it is proposed to institute the following arrangements.

Project Management Unit (PMU): The PMU, headed by the NPD, will be responsible for: (i) providing logistical and administrative support in carrying out the planned tasks; (ii) monitoring

project progress and impact; and (iii) identifying gaps and bottlenecks, including strategies to overcome implementation constraints; and (iv) dissemination of project results. It will be staffed with (7) international experts and (6) short-term consultants. These experts and consultants will be assigned to work with different units of the Water Affairs Sector.

Project Steering Committee (PSC): The project proposed herein is based on a multi-sectoral development framework. This requires participation of leading institutional stakeholders in prioritizing the project agenda in line with the national development priorities. Towards this aim, a PSC will be established to: (i) improve the quality of decision-making and managerial performance in the planning and implementation of project activities; (ii) ensure coordination among various implementing agencies; and (iii) address project implementation constraints on a regular basis. This Committee will not be involved in the routine day-to-day project management operations; instead its role will be to review and monitor project progress and provide advice and guidance to the implementing agencies in achieving project objectives. It is proposed that the H.E. Deputy Minister of Water and Electricity should chair the PSC.

UNDP will render its support and assistance normally provided to all technical cooperation projects. In addition, UNDP Country Office in Saudi Arabia will provide further support to MOWE required for the execution, monitoring, reporting, evaluation, and auditing of the project as well as management of the project's financial resources suitable to the needs and requirements of the project's expenditures. Throughout the project implementation, UNDP will also support building the technical and administrative capabilities of MOWE as an executing institution through the provision of experts' services.

The project's diversified activities and outputs towards reaching the desirable outcomes imply collaboration with the foreign specialized government institutions, the private sector and NGOs as deemed necessary. The overall management will be coordinated through the Ministry of Foreign Affairs.

The amount of the budget (**US\$ 6,636,558**) will be deposited with UNDP. Thereafter, payments for items identified in the matrix (budget) of each of the component projects will be made by UNDP after receiving disbursement instructions from the National Project Director. A financial report will be submitted to MOWE at the end of the project for the purpose of review and endorsement. In the event that both parties decided to close this Program and certain funds remained unutilized, UNDP will return the unutilized balance, after clearing all contractual commitments, to the MOWE or transfer to a successor phase of this Project depending on the preference of MOWE.

The budget estimates are subject to review as needs arise and there is enough flexibility to transfer among project budget activities.



5.2 Implementation Plan

The MOWE being the owner of this project will have the lead responsibility for its overall management, implementation, coordination, and reporting of project outputs and activities. From the United Nations side, as anticipated under the NEX modality, UNDP CO will provide necessary administrative and financial management support, and provide technical backstopping. In the implementation of this project, various national co-operating agencies and stakeholders (for example: MOA, MOI, KACST etc) will work hand in hand with the MOWE to execute the planned tasks. Upon acceptance of this Project document, UNDP will launch the recruitment process for the hiring of (7) international and (6) short term consultants according to the assigned tasks.

Responsibilities of the MOWE

Being the owner and lead implementing agency of this project, the MOWE is expected to:

- Provide required funding as tentatively spelled out in the budget section of this PD
- Designate a full time National Project Director to steer the project implementation;
- Establish a project steering committee to seek sector wide support to project implementation;
- Create an enabling environment (office space, computers, etc.) to facilitate the work of technical assistance team;
- Assign a team of counterpart staff to work with the international experts; and
- Overall supervision of project experts in collaboration with UNDP.

Responsibilities of (UNDP)

The project will be executed under the NEX modality, with UNDP providing administrative and technical assistance. Implementation Support Services (ISS) by UNDP will include;

- Finalizing the terms of reference of experts (technical assistance team);
- Searching and evaluation of candidates for different expert positions, and securing Government's concurrence to short listed candidates;
- Recruitment and fielding of experts;
- Technical backstopping to overall project, especially supervision and quality control of experts' work;
- Review and commenting on project reports and outputs;
- Submission of bi-annual progress reports on the status of project implementation, including reports on financial delivery; and
- Supporting the development and implementation of training program and study tours

SECTION 6 – MONITORING AND EVALUATION

The project implementation will be reviewed and evaluated at least at two levels, to be consistent with the level of responsibility. The first level of review and evaluation process calls for continuous monitoring of the performance indicators for different project components and outputs. The NPD will hold quarterly meetings with the implementing teams to review the progress of various activities against the agreed work plans and benchmarks.

The second level of review calls for more intensive review and evaluation of project performance on an annual basis. This review will be undertaken by the members of the PSC, including the representatives of the UNDP. Annual project progress report will serve the basis for discussion at this stage of the review. This meeting in addition to reviewing the past progress will approve the operational plan for the next year. In addition to Annual progress Reports, regular Quarterly progress Reports shall be submitted by NPD.

The project will be subject to independent evaluation twice in its life period. The mid-term evaluation will be undertaken during the beginning of the third year by an independent team of consultants. Terminal evaluation will be carried out before two months of the ending date of the project to determine its impact on development outcomes and to recommend about its relevance and continuity vis-à-vis development needs of the country.

SECTION 7 – LEGAL CONTEXT

This Project Document shall be the legal instrument referred to as such in Article 1, Paragraph 1, of the Standard Basic Agreement of the technical cooperation between the Government of the Kingdom of Saudi Arabia and the United Nations Development Program, which was signed by both parties on 4 January 1976. Through the coordination with the Ministry of Water & Electricity (MOWE), who shall be the Implementing Agency described in the Basic Agreement as the Cooperating Agency.

The procedures of procurements and financial expenditures will be within the frameworks of either Ministry of water and Electricity (MOWE) or UNDP (which is most effective) financial procedures and regulations. The project document can be revised as necessary according to the approved changes made by both UNDP and MOWE in order to produce the intended project outcomes. UNDP will conduct mandatory annual budgetary revisions, in consultation with MOWE, to adjust the expenditures and allocation of funds in accordance with the project's performance scheduled requirements.

SECTION 8 – MANAGEMENT RISKS & MITIGATION STRATEGY

The project undergo a number of potential risks which needs to be considered and provide appropriate mitigation to illuminate or reduce the effects during the project execution, the most critical of which are:

Insufficient support of MOWE - This project will not achieve the results anticipated unless MOWE including staff members at MOWE fully support both the goals of the project as well as day-to-day implementation and administration of the project. The risk of lack of support appears very low at this time given the strong support the UNDP project development team has received to date from the Ministry of Water & Electricity. In addition, all of the government officials contacted during the development of this project document expressed strong support for the goals of the project and offered their full cooperation. This risk has been further mitigated in the design of the project through the creation of the Project Steering Committee with representation from the relevant parties on the committee. Reducing the risk of lack of support has also been engineered into the design of each objective within the overall project, by including key stakeholders at each level in the program design and implementation, thus hopefully engendering their full support.

Insufficient Coordination - The insufficient coordination could result in key stakeholders not being informed of program plans and later slowing progress. This risk has been addressed both by the creation of the Project Steering Committee, as mentioned above, but also by the establishment of a National Project Director. This person will be responsible for monitoring the progress of the programs to assure their coordination, and feeding information up to the National Project Board and Project Steering Committee for action.

National Water Strategy – The National water Strategy is in the final stage of completion which will help to develop Work plan for strategic planning and provide detailed advice to improve capacities. The present project will provide comprehensive design of capacity development Program as the one of the services of the experts for preparation of action and implementation plans.

SIGNATURE PAGE صفحة التوقيعات

Country: Kingdom of Saudi Arabia

البلد: المملكة العربية السعودية

Project name:

Capacity building for sustainable development and management of water resources in the kingdom of Saudi Arabia.

Expected outcomes/ indicators:

Sustainable water resources development and management in kingdom of Saudi Arabia.

Implementing partner: (UNDP)

إسم المشروع:

بناء القدرات من أجل تنمية مستدامة لموارد المياه وإدارتها في المملكة العربية السعودية.

المخرجات المتوقعة / المؤشرات: تنمية وإدارة الموارد المائية بالمملكة بطريقة مستدامة.

الشريك المنفذ: برنامج الأمم المتحدة الإنمائي.

يتمثل الهدف من هذا المشروع في تعزيز القدرات الفنية والتنظيمية لوزارة المياه والكهرباء الى جانب تطوير أنظمة المعلومات

المائية لتحقيق التنمية المستدامة وإدارة موارد المياه في المملكة

The objective of this project is to enhance the technical and organizational capacities of MOWE as well as the development of water information systems to achieve sustainable development and management of the Kingdoms water resources.

Project name:

Capacity building for sustainable development and management of water resources in the Kingdom of Saudi Arabia.

Project Duration : 2012-2016

Project total budget: us \$6,636,558.

Financing agency:

Government of Kingdom of Saudi Arabia

إسم المشروع: بناء القدرات من أجل تنمية مستدامة لموارد المياه وإدارتها في المملكة العربية السعودية.

فترة المشروع: ٢٠١٢-٢٠١٦.

الميزانية الكلية للمشروع: ٦,٦٣٦,٥٥٨ دولار أمريكي.

جهة التمويل:

حكومة المملكة العربية السعودية.

عن برنامج الأمم المتحدة الإنمائي

(UNDP)

د. رياض موسى

Dr. Riyadh Musa

الممثل المقيم لبرنامج الأمم المتحدة الإنمائي

عن وزارة المياه والكهرباء

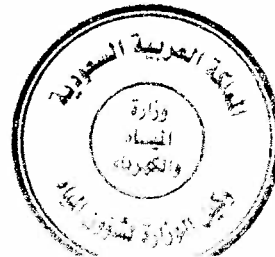
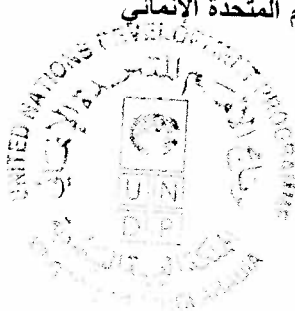
(MOWE)

عبدالله بن عبد الرحمن الحصين

Abdullah bin Abdul Rahman AL Hussayen

وزير المياه والكهرباء

وزير المياه والكهرباء



ANNEX 1– COMPONENTS, OUTPUTS AND ACTIVITIES

Component 1: Water Resources Assessment Monitoring & Protection

Output 1.1: Comprehensive National Water Resources Use Assessment & Evaluation

Indicative activities: Evaluate and update renewable water resources including surface water resources and provide optimal water allocation plan; Agricultural water abstractions assessment with the help of remote sensing; A comprehensive assessment of groundwater withdrawals (extractions) for use in urban water supply, rural and irrigation for each administrative zone; Capacity development (conduct seminars, workshops & training sessions for water resource assessment); review of groundwater assessments prepared for MOWE by other projects;

Output 1.2: National Water Resources Monitoring & Evaluation Program

Indicative activities: Prepare detailed work plan regarding monitoring parameters (water level, salinity etc), for periodic monitoring and sampling; Review of existing monitoring and sampling program and conduct addition monitoring surveys; forecast potential water supply shortages and determine mitigation measures to maintain existing groundwater supplies and conserve water resources for sustainable development; Capacity development (conduct seminars, workshops & training sessions for water resource monitoring procedures and protocols)

Component 2: National Integrated Water Resources Management (IWRM) Plan

Output 2.1: Develop National Integrated Water Resources Management (IWRM) plan for sustainable development & Management

Indicative activities: Prepare National Integrated Water Resources Management plan using following approach: compile data from detailed studies on water use in different consuming sectors; assessment of water supply-demand gap over the planning horizon; develop alternative water management strategies consisting of economic, institutional, engineering, and demand management measures; socioeconomic analysis of these strategies; stakeholders consultations on socioeconomic feasibility of these measures; Present plan to stakeholders and initiate its implementation; Capacity development of MOWE staff related with various IWRM components with the help of seminars, workshops and training sessions for MOWE staff and stakeholders.

Component 3: Water Resources Data Management

Output 3.1: Upgrade Comprehensive Water Resources Information Center¹.

Indicative activities: Upgrade WRIC design and install hardware & software to receive larger inflow of data from national monitoring network and directorates; Integration of decision support system with databases & develop protocols for detailed analysis and to generate reports & maps; expand GIS operations to support policy analysis, load groundwater and hydrological models to use for future planning and decision making process; interfacing users sharing network within MOWE and other Ministries; develop mechanisms and protocols for sharing and dissemination of water information (electronic search and “hard copy” outputs); integration of decision support systems with the databases; develop protocols to generate intended outputs and analysis; develop partnerships for data collection with other relevant agencies, and develop mechanisms for ensuring sustainability of flux of data to MOWE database; Conduct seminars, workshops and training sessions for architecture, data loading, interfacing and reporting for water resources planning.

Component 4: Human Resources Development & Capacity Development

Output 4.1: Formulation of Human resources Development Plan & Strategies

Indicative activities: prepare of human resources development program; prepare annual training programs; organize visits/tours to relevant national and international institutes to learn best practices of water resources management; Implement training program for contract/bid document preparations, regulatory system enforcement, supervision of studies; training of counterpart hydro-geologists at MOWE; supervision of the work of other groundwater modeling work on request by MOWE; on-the-job training of national groundwater modelers; training of national staff through different training modules, such as: on-the-job training, training workshops, study tours, and short-term fellowships. establishment of project steering committee; organize regular steering committees meetings for coordination of national work on water resources, water supply and demand, project approvals; increase staff productivity through skill development, empowerment, and recognition of good performance.

¹ Comprehensive Water Resources Information Center is based on a set of standards interfaces of homogeneity and scientific relevance. It usually includes the data from monitoring networks; relational databases including water resources and their utilizations; relevant socioeconomic data; water administration data; projects as well as analyzing tools such as statistics, models, GIS applications, and satellite imagery analysis together with interfaces between these main elements.

Component 5: Organizational Restructuring & Public Privatization Partnership

Output 5.1: Organization Restructuring Plan for Water Resource Regulatory Agency (WRSLA)

Indicative activities: Supervise implementation of Organizational Restructure Program as part of Strategic Transformation Plan (STP); develop Implementation Plan for establishment of Water Services Regulation & Licenses Authority (WSRLA); develop regulatory and permit system; prepare TORs for establishment of various units, capacity development of staff proposed to be established; assessment of capacities required to perform tasks required by each section/unit; develop business Plan and associated regulatory system for Privatization of Water & Wastewater Facilities; supervise & implement Public Private Partnership (PPP) Plan, prepare Terms of Reference (TORs); assist in developing the regulatory system with institutional framework for implementation; develop work plan for management support of on-going management contracts of Riyadh and Jeddah cities; formulate plans to bring investments to rehabilitate and construct new infrastructure for water and wastewater facilities; Conduct seminars, workshops and training sessions for concept of PP strategy & international case studies

Component 6: Water Quality Monitoring, Protection & Enforcement

Output 6.1: Development plans and Strategies for Water Quality Monitoring & Regulatory System

Indicative activities: Develop and update standards, procedures and guidelines for drinking water Quality, wastewater and bio-solids treatment, reuse and disposal in agriculture, industries and recreation activities; develop Regulatory System for drinking water Quality, wastewater and bio-solids treatment, reuse and disposal; develop procedures for implementation of “polluter-pays principle” and develop applicable water & wastewater regulatory system and implementation; develop plan for institutional structure for enforcement of the regulatory system; delineate and monitor Water Resources Protection Zones for drinking water supply sources and develop framework for regulations & implementation; evaluate existing capabilities in the Kingdom; assist in upgrading national capacities with respect to needs of MOWE, conduct seminars, workshops and training sessions for Quality Assurance (QA/QC) and validation techniques.

Component 7: Climate Change Impacts on Sustainability of Water Resources & Disaster Mitigation

Output 7.1: Detailed synthesis of vulnerability of water resources due to climate change & climate disaster prediction and prevention plan

Indicative activities: Evaluation of future Climate Forecasts and impacts on water resources by using detailed review of regional and local climatic model results; & develop disaster reduction and mitigation plan for reduction of climate change impacts as part of Sustainable Water Resources Development & Management Program under scarce conditions; Review all research works and compile results related with climatic change impacts on hydro-meteorological conditions of Saudi Arabia; define areas expected to be affected by flash run-off; review and implement international Strategy for Disaster Reduction; Develop scenarios for the Water Resources management as a result of the prospected climatic change and develop mitigation plans to reduce and minimize the possible impacts on water resource sustainability of the Kingdom; Conduct capacity development program for national staff through different training modules, such as: on-the-job training, training workshops and study tours

Component 8: Integrated Strategic Program for MDGs Promotion

Output 8.1: Develop Capacity Development in Strategic Program for National MDG development Strategy

Indicative activities: Develop Integrated Strategic Working Program & Implementation Plan to achieve National MDGs related with water resources; develop strategic plan for monitoring and evaluation of progress towards achieving MDGs, Conduct capacity development program for national staff with the help of on-the-job training, training workshops and study tours.

Component 9: Specific Strategic Projects

Output 9.1: Specific Strategic Hydrological & Water Resources Studies Reports & Capacity Development in Hydrological & Groundwater Modeling Techniques

Indicative activities: (i) Carry out dam efficiency analysis, including evaluation of new possible dam sites, design (ii) carry out special studies of selected areas aimed at evaluating their potential and productivity, including the siting of wells in fractured aquifers in fractured/discontinuous aquifers of the Arabian Shield complex (iii) Detailed hydro-geological studies of selected critical areas of the sedimentary multilayered aquifer system

including detailed studies on groundwater abstraction; design and supervision of geophysical studies, including geophysical logging of existing wells; monitoring programs for piezometric observations; carrying out and analyzing pumping tests; (iv) Review and supervision of modeling work activities conducted by other consultants (v) Input and update all previous calibrated models of Ministry with the help of new data for Groundwater Management; Construct Solute Transport Models (STM) with MT3D software for potential contaminated and excessive pumping areas; MT3D model for pollutant transport on selected field cases; prepare and calibrate new models in "hot spot" areas, both where overdraft and pollution occur; (vi) Capacity development of MOWE staff for advance techniques of Hydrological and Groundwater Modeling for Water Resources Planning and Management; (vii) Conduct seminars, workshops and training sessions for advanced Groundwater Modeling techniques.

Component 10: Water Conservation & Efficient Management

Output 10.1: Develop Comprehensive Plan for Best Practices for Water Conservation and Efficient Management

Indicative activities: Develop comprehensive Water Administration Operational Plan (Water Supply and Wastewater Collection Network) with advanced water transmission and distribution system; develop comprehensive water administration framework (water concessions, water rights, licensing of wells, permits to withdraw water, licensing of drilling and consulting companies etc.); Install hardware and software computer Programs to operate advanced water transmission and distribution system; Conduct seminars, workshops and training sessions for advanced administration techniques for MOWE staff; To promote work plan for best practices in water conservation technologies; Develop operation plan for enforcement of National Water Conservation Strategy; Conduct seminars, workshops and training sessions for advanced Conservation Techniques; Raising awareness about critical water issues and strategies to address these; interfacing with KACST (national water use efficiency program) to promote the use of good practices and water conservation technologies; coordination with Ministry of Agriculture to promote demand management measures in agricultural water use.