Evaluation Report: Annual Evaluation of "Sustainable Development and Integrated Water Management" Project

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Capacity Development and Related Services for an Integrated Sustainable Development and Management of the Water Sector in the Kingdom of Saudi Arabia in the Framework of the VISION 2030.

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Project at glance

PROJECT/OUTCOME INFORMATION		
Project/outcome title	Sustainable Development and Integrated Water Management	
Atlas ID	SAU10/107888	
Corporate outcome and output	National Capacities Developed for Better Management of Non-oil Natural Resources	
Country	Saudi Arabia	
Region	RBAS	
Date project document signed	20/02/2018	
Project dates	**Start**	**Planned end**
	01/03/2018	28/02/2022
Project budget	**$24,859,429**	
Project expenditure at the time of evaluation		
Funding source	**Government Cost-Sharing**	
Implementing party	**Ministry of Environment, Water and Agriculture**	
Contributing Outcome (UNDAF/CPD, RPD or GPD):	**Improved management of non-oil natural resources and preservation of culture and heritage**	
Indicative Output(s):	**National capacities developed for better management of non-oil natural resources**	

Project objective

The project aims at strengthening and optimizing the technica and organizational capacities

of the MEWA with respe to water resources and water supply management of the Kingdom

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Disclaimer

This report is the work of an independent consultant and does not necessarily represent the views, or policy, or intentions of the MEWA or UNDP.

Acronyms and abbreviations

Acronym	Definition	Acronym	Definition
ADF	Agricultural Development Fund		
CTA	Chief Technical Advisor	KPI	Key Performance Indicator
DG	Director General	KSA	Kingdom of Saudi Arabia
GCC	Gulf Cooperation Council	KSU	King Saud University
GDP	Gross Domestic Product		
GHG	Green House Gases	MEWA	Ministry of Environment, Water, and Agriculture
GM	General Manager	NPC	National Project Manager
GW	Groundwater	NTP	National Transformation Plan
IWRM	Integrated Water Resources Management	NWC	National Water Company
IWIS	Integrated Water Information System	NWS	National Water Strategy
NCWRS	National Center for Water Research and Studies	OPEX	Operational Expenditure
M&E	Monitoring & Evaluation	UNDP	United Nations Development Program
		SAR	Saudi Riyal
		WMCC	Water Management and Control Center

Executive summary

Project description

1. In recent years, the Kingdom of Saudi Arabia has undertaken enormous efforts to save and protect one of its most precious resources, water, and to ensure a high-quality and lasting supply with water for all purposes for its population. The basis for this was a National Water Plan, which has been updated in 2017. Within this updated plan (Saudi National Water Strategy 2030, Strategy Definition Report), a series of strategic programs and initiatives have been formulated, many of which shall be implemented in cooperation with UNDP according to the present proposal1.

2. In order to make a transition to sound water management mode, it is important to strengthen the technical and organizational capacities of the MEWA to deal with the triple challenge of water exploitation and distribution (operational side), research for additional resources and cutting-edge technologies to satisfy the increasing demand (research side), and rigid control and administration of all water-related aspects (control side). Second, a sound information base covering data on groundwater availability, quality, withdrawal, and usage is about to be put in place.

3. The MEWA has limited capacity and experience in this field. 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 of water resources and management of water-related affairs in the Kingdom to ensure permanent and sufficient supply.

4. The project results are presented under 6 key outputs:

    - Output1: Integrated Water Resources Management System implemented
    - Output2: Overall Secondary Water Resources supply-mix increased
    - Output 3: Integrated Water Supply Management System fully operational
    - Output 4: Public Relation Center Established
    - Output 5: MEWA Capacity Enhanced
    - Output 6: The National Water Research and Studies Center

Scope

5. Annual evaluations are set to ensure targets are met and course of action corrected when needed during the lifetime of the project. This 2019 annual evaluation, the first since the start of the project, is meant to gauge the progress of all outcomes, in terms of delivery and also in how far the indicators are being met and to recommend the changes needed.

6. The specific objectives of this evaluation are to assess progress towards achieving project targets, assess the project appropriateness of the project design and its

[1] MEWA, The National Water Strategy, 2018.

relevance and effectiveness and effectiveness, efficiency and sustainability in achieving results.

7. This evaluation focuses more on process and results of first 18 months implementation and draw on emerged issues and opportunities to enable adaptive management.

Approach

8. The evaluation has been undertaken in line with UNDP principles concerning independence, credibility, utility, impartiality, transparency, disclosure, ethical, participation, competencies and capacities[2]. Evaluation is an evidence-based assessment of a project's concept and design, its implementation and its outputs, outcomes and impacts as documented in the project document. Evidence was gathered by reviewing documents, interviewing key, selected stakeholders and from other ad hoc observations.

9. Evaluation approach involved mix methods included desktop review, stakeholders engagement, application of evaluating criteria and ratings, semi-structured interviews (total of 26 conducted in this evaluation) and data gathering and analysis.

Findings

The following are the key findings from this evaluation:

Key findings
Appropriateness Ratings Project relevance: **Relevant** Project design**: Moderately unsatisfactory**
- The project overall objectives and outputs are aligned to the MEWA needs and priorities, vision 2030 and UNDP priorities. - Weak design of the results framework, governance structure and risk identification and management. And the process was cumbersome and the project document was limited to be used as a "blue print" for the Implementation Team. **(see justifications under section 5.1)**
Effectiveness Rating **Moderately Satisfactory**
- A moderately satisfactory progress in meeting its expected results. Anticipated activities for the first 18 months have been implemented, with portion of shortcomings. - The review of the project achievements indicates generally a strong focus on activities as opposed to developmental results (i.e capacity building).

[2] Guidance for Conducting Terminal Evaluations of UNDP-supported, UNDP Evaluation Office, 2012.

- The project has not established clear understanding of the capacity needs yet, and lacks for clear capacity building strategy to achieve the outcome
- Inadequate communication of project achievements to MEWA decision makers and broader stakeholders

(see justifications under section 5.2)

Process

Rating

Moderately unsatisfactory

- Limited application of adaptive management approach to capture emerging opportunities and overcome faced barriers. For instance, the project recognized the need to re-design the scope and management arrangements, but had not implemented the review process according to standard project management requirements.
- The current management arrangements are ineffective. These are largely the result of ambiguities in the original project design (the Project Document) and ad hoc arrangements in the different components of the project.
- Six project experts are performing a general director role at MEWA, in a director capacity, the experts' time is dedicated to undertake managerial tasks at the expense of the technical input. In addition, the sustainability risk that this model brings is not addressed in project delivery and monitoring.
- The project teams have limited knowledge and experience in project management basics and skills that are intrinsic to the successful project delivery, such as project monitoring, reporting, risk management, and outsourcing consulting services.

(see justifications under section 5.3)

Efficiency

Rating

Moderately Satisfactory

- The project is largely reliant on external funding sources to implement its activities and no clear resource mobilization plan outlining funding alternatives – should the NTF funding fails.
- **Key project outputs are under-resourced, mainly the NCWRS and** Water Extensional Education Center**.**
- The project failed to obtain the required hardware and software to undertake the highly technical modelling work.
- The project is going through s budget deficit of ~$1 mil, mainly due to hiring more experts than originally planned to.

(see justifications under section 5.4)

Sustainability

Rating

Moderately likely

- There are key concerns over the sustainability of the program results, especially in terms of skills and knowledge transfer from experts to the MEWA staff, and MEWA ability to run the business beyond the project.
- The project document has no discussion on sustainability and how it should be secured through project results.
- The outcomes of groundwater regulations and enforcement component will likely sustain beyond the project.
- The MEWA sees the project valid and relevant and therefore participate in and own the project activities.
- The financial sustainability of the project is uncertain in light of the funding dependencies and ambiguities of the project resources gaps and mobilization plan.

(see justifications under section 5.4)

Recommendations

10. Based upon its findings and conclusions the evaluation makes number of recommendations that are summarised here (***more details available under section 6***):

Recommendation #1: Undertake a substantive review of the project document.

11. The review of the project would mainly aim at documenting the change of scope and its subsequent implication on other project aspects such as budgeting, and developing a new governance model and management arrangements and address the gaps identified in this evaluation, mainly as related coordination and decision making mechanisms. The review should include a re-design the M&E framework, and develop a new risk log that identifies emerging risks and mitigation strategies.

Recommendation #2: Identify capacity needs and develop a capacity building plan

12. The evaluation indicated that the sustainability of project achievements should be ensured, particularly due to the strong national ownership of these achievements. Most achievements are already institutionalized, which is an excellent first step toward sustainability. However, the project needs to define its exit strategy after the project ends including extension scenarios and how the MEWA would be able to run its business beyond the project.

Recommendation #3: Re-structure the project management unit with an intent to enhance the project management capacity and streamline decision making process.

13. This should include supporting the PMU with strong project management capacities, clarifying project management duties clearly between the PMU members (PM, CTA, and NPC), and enabling the deputy minister to perform higher strategic role in the project decision making and governance. See details under section 6.

Recommendation #4: Re-activate the project board and project coordination group (currently called steering committee)

14. This project board is critically crucial in influencing the strategic directions of the project. The board is a strong governance platform to make on consensus-based management decisions for a project, provide strategic guidance and help to overcome risks. It is important to convene the project board with the same composition as described in the project document, at least, twice a year. The project board is particularly needed to oversee the implementation of the recommendation in this evaluation. It is also recommended that the project steering committee ToR is reviewed with an intent to make this a coordination platform.

Recommendation #5: UNDP to support the project with communication expertise.

15. It is obvious that there is inadequate communication of project achievements to MEWA decision makers and broader stakeholders. It is understood that UNDP CO has recently established a communication capacity to support various programs, and it is highly recommended that a communication specialist supports the PMU to communicate the project achievements appropriately and effectively.

Recommendation #6: Upgrade the software and hardware assets to meet the modelling technical requirements

16. The project failed to obtain the required hardware and software to undertake the highly technical modelling work, as this is essential to undertake the modelling work on ongoing basis, it is recommended to invest in such a foundational basis to deliver high quality product and upgrade the already purchased software and hardware, and if required, buy a new ones.

Recommendation #7: assess the project financial needs and develop a resource mobilization plan

17. As noted in the evaluation, the project offers relatively limited resources comparing to the scale of the activities. The project is highly dependent on external funding, in some cases, non-recurrent public funding. It is recommended to assess the funding gaps, map funding opportunities and develop resource mobilisation plan including scenarios for securing the required funding.

Recommendation #8: review the project resourcing strategy and ToRs of all experts and address the deficit

18. It is recommended to undertake a holistic review of all experts ToRs to be more driven by the needs under each output, and balance the experts allocations to different outputs as well as review the expert engagement modality including short-term assignment in case if the sought deliverables don't necessarily need a full time-job.

19. In light of these proposed changes in experts engagement modalities and other changes in resourcing strategy, the budget deficit need to be addressed as well.

Recommendation #9: Design fit-for-purpose reporting templates with a greater focus on the M&E framework – including the performance indicators.

20. The monitoring template used by the project includes a long list of questions - in addition to the reporting on performance indicators - that need to be answered

to complete a semi-annual monitoring report. It is too time consuming, cumbersome to complete and the result is that it does not provide accurate and timely information on how the project is progressing. There is a need to review the reporting template, to shorten it and focus on the performance framework with the set of indicators as the central part to measure how well the project is progressing toward the achievement of its expected outputs and outcomes.

On that front, it is important to guide the project management to deliver fit-for-purpose reporting. For example, developing **a 1-page dashboard reporting template** targeting decision makers.

Lessons

21. This evaluation has highlighted a number of good practices as well as problems encountered that provide potentially useful lessons for other projects implemented by UNDP CO. Based on the review of project documents, interviews and meetings with key informants, and the analysis of this information, the Evaluator collated several lessons learned that are presented below:

- **Adaptive management and the project cycle should be clearly understood**. Absence of adaptive and agile project management approach leads to further complicate the barriers and missing the change opportunities. The inception phase is the first opportunity to review the current status of the project and to determine whether circumstances have changed against the assumptions made in the Project Document. The inception phase should have the confidence and authority to significantly challenge the project's design and not to accept it as a fait accompli. The role of an inception phase that could have been utilised to allow for validating the project design prior actual implementation starts. It would have helped addressing the deficiencies in the project design. Such a project needed a defined inception phase at start up to review the design elements, engage stakeholders. Any changes to the programme strategy, management arrangements, monitoring framework and participation of stakeholders should be documented in an inception report, which should be endorsed by the management committee overseeing the development of the programme/project.
- **Project governance and management arrangements are critical to the successful outcome of a project**. Much of the confusion surrounding the management arrangements in the project appear to have stemmed from imprecise instructions in the Project Document. Deficiencies in project governance design lead to severe delivery risks. This was evidently the case with this project where governance was largely ineffective and highly influenced the decision making and day to day business.
- **Projects need to balance the focus on activities versus the developmental results**. Generating high quality products and services may not be enough, unless achieving the ultimate intended outcome (i.e capacity building). In case of this project, there are significant

achievement mainly studies, analyses, information, and training events. There are indispensable deliverables but they also remain as information products, unless stakeholders uptake these information, used it and build the capacity, the long-term impact of the project will be limited.

1. Introduction

1.1 Strategic context

22. Water is at the center of economic and social development; it is vital to basic human needs, manage the environment, and sustain economic growth[3]. Despite water's importance, the Kingdom is facing serious challenges due to unsustainable use of water resources. The kingdom has limited reserves of non-renewable groundwater which are being rapidly depleted. Due to arid climate conditions, renewable water is extremely scarce. The high water demand in the agriculture sector is exacerbating the water scarcity situation in the kingdom. Urban water and sanitation services incur a high cost to the government, yet the service levels are sub-optimal. The sector is further impeded by inadequate institutional setting and governance mechanisms.

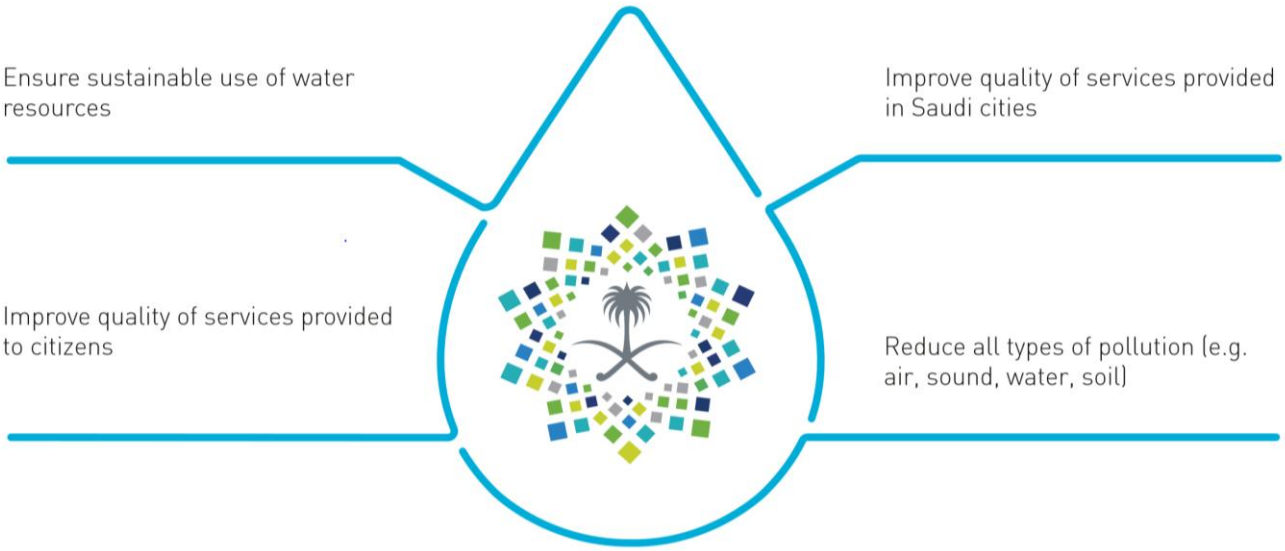
23. In recent years, the Kingdom of Saudi Arabia has undertaken enormous efforts to save and protect one of its most precious resources, water, and to ensure a high-quality and lasting supply with water for all purposes for its population. The basis for this was a National Water Plan, which has been updated in 2017. Within this updated plan (Saudi National Water Strategy 2030, Strategy Definition Report), a series of strategic programs and initiatives have been formulated, many of which shall be implemented in cooperation with UNDP according to the present proposal[4].

24. The still rapidly increasing population mainly counteracts the successes the Saudi government and MEWA have achieved in sustainable resources water management through its reforms. In addition, newer and more precise predictions of the effects of climate change indicate that Saudi Arabia will be affected more than had been assumed only a decade ago. Together with the recognition that the sole dependence on hydrocarbons as the major income for the nation may have adverse effects, the Saudi government has implemented an ambitious program to transform Saudi Arabia into a more flexible and diversified society with its VISION 2030.

25. In meeting Vision 2030 goals the Kingdom of Saudi Arabia and, specifically, in this case, the Ministry of Environment Water and Agriculture are keen to meet all of the SDG goals especially as pertains to this project in terms of water in Goal 6: Clean Water and Sanitation, Goal 11: Sustainable Cities and Communities, Goal 12: Responsible Consumption and Production and, Goal 13: Climate Action.

Figure 01: Vision 2030 strategic objectives

[3] UN Water, World Water Development Report, 2019.
[4] MEWA, The National Water Strategy, 2018.



26. With a rapidly growing population of presently close to 32 million[5], the Kingdom of Saudi Arabia faces a number of challenges including growing urbanization and environmental change. While urbanization poses great pressure on regional water and sewage infrastructure and bears pollution risks, environmental challenges include depletion of aquifers and increasing torrential flood risks. Earning relatively high annual revenues from natural resources, Saudi Arabia has invested heavily in development and upgrading infrastructure during the past few decades, including in water and sewage infrastructure, road networks, housing, hospitals, and schools.
27. Due to MEWA's 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.
28. Nevertheless, a set of bolstering measures towards sustainable water supply even in stress and emergency situations and minimizing the climatically induced environmental risks needs to be formulated. These actions or interventions simultaneously should target the supply side; curtail water demands in various productive sectors; and mitigate the environmental risks.
29. However, to make a transition from the current patterns of water administration to sound water management mode, two things must happen. First, there is strong need to strengthen the technical and organizational capacities of the MEWA to deal with the triple challenge of water exploitation and distribution (operational side), research for additional resources and cutting-edge technologies to satisfy the increasing demand (research side), and rigid control and administration of all water-related aspects (control side). Second, a sound information base covering data on groundwater availability, quality, withdrawal, and usage is about to be put in place.

[5] Saudi Government, SDG First National Voluntary Report, 2018.

30. The transformation of this information into an all-encompassing water resources management requires sustained long-term efforts, especially since the MEWA has limited capacity and experience in this field. 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 of water resources and management of water-related affairs in the Kingdom to ensure permanent and sufficient supply.

1.2 Project background

31. The present project builds upon the work that either has been completed or is currently being carried out by the MEWA, especially in relation to the formulation of the VISION 2030. With the necessities to comply with the timeframe and goals of the VISION 2030 and the corresponding Initiatives 2020, the responsibilities and the workload of the MEWA were considerably enlarged, often into subjects that hitherto have not been the core business of the ministry. Simultaneously, the water-related necessities of all sectors of the society are also increasing.

32. MEWA's Vision to comply with all these goals is the creation of a Water Management and Control Center (WMCC). In this center, nationwide strategic decisions will be made on the highest administrative levels, based on accumulated knowledge and the most recent economic and technical achievements. Real-time actions can then be implemented immediately, including emergency situations. Real-time decisions in parts are facilitated by the Integrated Water Information System (IWIS), presently under development within the precursor program of this project proposal. The contributions of the proposed project to WMCC are described in the following.

33. The proposed project aims at complementing the efforts for Vision 2030 and for WMCC in implementing national water management goals and objectives 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. In fact, this project will initiate a capacity development process that will gradually contribute to the technical and professional growth and development of the MEWA, and will enable it to steer the process of Integrated Water Resources Management (IWRM) plus regulation. 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 private implementation 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. Description of the interventions

2.1 Problems that the Project Sought to Address

34. Saudi Arabia with its almost 2.2 Million km^2 is among the driest countries in the world. It is dominated by an arid climate, only in the southwestern parts semi-arid

conditions prevail. Although several desalination plants have been built and several are under construction, water supply still dominantly is provided by groundwater. As under the present climatic conditions, groundwater recharge is negligible, the abstraction of groundwater is groundwater mining. Given that the present population of around 32 Million is supposed to increase to almost 40 Million over the next two decades, and given that the per capita water consumption is far above the OECD average, one of the most prominent challenges of Saudi government policies is the sustainable water supply of all urban, agricultural, and industrial sectors of Saudi Arabia over the next decades.

35. Recognizing the social and economic importance of this challenge, several strategic tasks were identified that shall answer the challenge of still increasing needs for sustainable water supply in all sectors of the society and the effects of accelerating climatic change:

    1. Capacity development and institutional adaption to the amplification of MEWA's responsibilities and tasks;
    2. Development and implementation of an all-encompassing "Water Resources Management System";
    3. Development and implementation of an all-encompassing "Water Supply Management System" with the ultimate goal of securing water supply in normal times and stress situations;
    4. Development of strategies to mitigate and counter the effects of climate change (increasing rainfall with flash flood risk while taking advantage of the additional potential water resources);
    5. Consideration of surface water as a supplementary strategic reserve and its exploitation;
    6. Investigation of the exploitation potential for secondary groundwater resources and resources in remote areas and provision of the infrastructure necessary;
    7. Amalgamation of the existing databases and database systems plus adaption to the increasing portfolio of the MEWA.

36. Groundwater abstraction focused on the easily accessible and prolific aquifers of the Kingdom. However, groundwater in considerable amounts is also present in smaller, sometimes more remote aquifers, or in aquifers, whose hydraulic parameters do not permit high abstraction rates per time. Developing these potential resources for future use requires novel economic and technological approaches. Similarly, the ever-increasing rate of treated wastewater production by far outpaces the concepts for its storage and reuse. In coastal areas, large amounts of well-treated water are disposed of in the sea. There is an urgent need to convert these amounts of water into potential and accessible resources, e.g. through artificial storage. Some of the problems of artificial recharge are discussed in section 2.2.8.

37. While groundwater pollution through irrigation return has long been recognized and counter measures are known, pollution through improperly treated wastewater and its infiltration is a major challenge. While pollution through inorganic chemistry mainly can be handled, contamination with microbes and bacteria and its treatment is hardly understood, although it constitutes a major

health risk. Coastal areas with a high density of population are prone to over-abstraction of groundwater from the shallow aquifers that discharge to the sea. Water in these areas is used for agriculture and for domestic supply. With increasing overdraft, the natural discharge is reversed and up-coning of saltwater leads to a rapid deterioration of aquifer quality. Concepts for mitigation or prevention of this phenomenon are missing. Radioactive contamination, mainly through 228Rn, is widespread in Saudi aquifers. Primary treatment through osmosis is a recognized counter measure; however, the resulting sludge has much higher concentrations of radioactivity. This mud is regularly not adequately disposed of. As the deposits in the vicinity of the treatment plants are accessible and not protected , they form a major health hazard.

38. With increasing depth, groundwater successively is warmed up through Earth's natural emission of heat. The inherent energy can safely be converted into electrical energy and used for cooling or otherwise. Shallow hydrothermal systems are available for temperatures above about 50°C, while true geothermal energy is produced with waters above 100°C temperature. This kind of environmental-friendly energy (no emissions, regenerative) is of special relevance for remote areas that otherwise would have to be supplied with hydrocarbon-based energy.

39. The recent water-saving campaign was a successful measure and led to a per-capita water consumption decline. However, in order to raise public awareness about the entire problematic situation of the water sector as outlined above and of the environment in general, an institution for educational purposes and for publicity should be established, "Environmental Awareness Center".

40. According to recent regional climate models for the Arabian Peninsula, Arabia will experience a rise of up to 4°C of average annual temperature and locally an increase of around 20% rainfall annually. Individual rainfall events are predicted to become more intense and temporally less predictable with a wider spread of events over the year. The increase of rainfall intensity increases the risk of torrential floods originating in the upper wadis and propagating down-wadi towards either the coastal plain with its dense population or towards the Najd, where similarly high population densities are present. At the same time, increased rainfall is a potential source for additional water resources. Hence, a major challenge is the development of flood protection systems that at the same time can transform large amounts of surface water into a water resource. This latter point is also part of the task described in section 2.2.7.

2.2 Project strategy

41. The overall objective of the project:

"Strengthening and optimizing the technical and organizational capacities of the MEWA with respect to water resources and water supply management of the Kingdom"

42. With the increase in tasks attributed to the MEWA and the concomitant increase in the portfolio, the MEWA personnel must be trained to accomplish the new challenges. The cooperation with UNDP and its provision of international experts for project work and capacity development is expected to regain the capability of the MEWA of complying with all tasks at the highest possible level.

43. MEWA Capacity Strengthening and optimizing the technical and organizational capacities of the MEWA with respect to water resources and water supply management of the Kingdom is the core objective of this project.

44. The project involves implementation of IWIS in the precursor project, the processes and data models of an integrated water resources management have been elaborated. These include processes from data acquisition through data processing (modelling) to implementation of a monitoring system for all steps up to the consumer end side. IWIS shall now be implemented step-by-step. After completion, this system will be a key for input in WMCC.

45. The project also addresses the Integrated Water Resources Management (IWRM) concept. Water Resources Management requires the knowledge about the available sources. For their evaluation, these resources have to be split up into renewable and non-renewable resources on the one side and into surface water and groundwater resources on the other side. With the known distribution of the resources and their renewal time, the resources can be modelled to obtain accurate values for their potential amount. Discretization of the potential amount according to e.g. water quality, reservoir depth, and distance to consumer will then provide the economically available amount. This discretization is the basis for allocation of water to different groups of consumers (domestic, agricultural, or industrial): the Water Supply Management.

46. Water Supply Management requires the knowledge of all facilities that serve directly or indirectly for water supply to the different customers. In addition, this management must consider risks, whether natural or intentional, to the infrastructure and requires plans for emergency in the case of damage. In addition, the Water Supply Management will have to consider the optimal mix of different water resources under economic aspects. As in Saudi Arabia water scarcity is the dominant factor in the entire water cycle, control of water distribution and abstraction is of prime importance. Hence, a rigid monitoring and licensing program must be implemented.

Specific project objectives – as in the project document:

- **Strengthening and optimizing the technical and organizational capacities of the MEWA with respect to water resources and water supply management of the Kingdom**
- **Implementation of IWIS**
- **Design of an overall Water Resources Management with implementation and enforcement**
- **Design of an overall Water Supply Management System with implementation**
- **Establishing an all-encompassing monitoring system for the surface water and groundwater processes**
- **Assessing the effects of climate change on the society and nature not only in the water business**
- **Evaluating comprehensively the potential of water resources hitherto not in the focus of water supply: secondary and remote aquifers, surface run-off**

and rainwater harvesting, large-scale reuse of wastewater for agricultural purposes

- **Evaluating environmental risks associated with the water cycle (groundwater pollution, seawater intrusion, radioactive contamination) and elaborating counter measures**
- **Investigating the additional, water-inherent resources (hydrothermal energy, geothermal potential)**
- **Establishing an Environmental Awareness Center for public awareness**

2.3 Project results

47. According to the project document, the project results are presented under ten major sections:

48. **Section 1 Capacity Development**: Capacity development With the delegation of several post-graduate students to foreign universities, the MEWA intends to raise the spectrum of disciplines that will be represented by its personnel. As not only natural sciences careers are envisaged for the students, but also economics, business management, and public relations and communications management, the MEWA will head towards an all-encompassing, integrated water resource management facility.

49. **Section 2 IWIS:** IWIS is intended to be a system that provides visual oversight over data and that provides automated decision-making support on both end of the water sector chain (provider and customer). The steps required are set-up of the database system, development of visual interfaces and applications for all activities, and pilot projects for testing.

50. **Section 3 Integrated Water Resources Management:** Water Resources Management heavily depends on the knowledge of available resources. As these cannot directly be measured, modeling is the method of choice to approximate available quantities.

51. 1) Groundwater Modeling. To predict the effects of groundwater abstraction, for each of the major groundwater systems, an individual groundwater model has been developed during the past decade. In the next step, these models must be combined into an overall groundwater model for the entire Kingdom. In a second step, economic aspects have to be incorporated into the model such as water quality, depth of the resource, and distance to consumers, among others. With this additional information, groundwater management zones will be established that are the basis for water allocation to the different groups of consumers. For the interpretation of reservoirs, a 3D-visualization will transform the rather abstract GIS- and modeling outputs into a basis for the daily work.

52. 2) Hydrological Modeling. Hydrological models describe all processes involved in the surface water cycle with the parameters rainfall, temperature, solar insolation, wind, evapotranspiration, run-off, infiltration, and groundwater recharge. In this project, the first purpose of hydrological modeling is the quantification of groundwater recharge through considering rainfall, infiltration, and

evapotranspiration. The next step here required is a better delineation of recharge areas for the individual aquifers, as these partly overlap. The second purpose is predicting the effects of individual flash floods through constant monitoring of surface water processes. With the expected climatic change, peak floods will increase and hence, the intensity of flash floods. Knowledge about peak discharge is essential for planning proper flood-protection systems in the affected areas. The third purpose is the optimization of surface-water "harvesting" through providing the hydrological parameters for the planning of the corresponding infrastructure.

53. **Section 4 Integrated Water Supply Management:** Integrated Water Supply Management requires an intimate knowledge of all facilities that serve water abstraction, distribution, and supply to the customers. A first step is a detailed categorized inventory of these facilities. With this inventory, gaps in the infrastructure can be recognized and Water Supply Management Zones (WSMZ) established. The inventory also serves for determination of the ideal supply mix within each WSMZ.

54. On the operational side, Water Resources Management includes the planning and maintenance of a distribution network to guarantee constant water supply. This system must consider times of peak consumption (summer, Hajj, Umrah), and major events that lead to a partial breakdown of the network.

55. **Section 5 Monitoring:** Modelling strongly depends on input parameters; hence, an all-encompassing monitoring network is required. Key components for hydrological parameters are rainfall gauges, runoff gauges, and weather stations, which are needed for groundwater recharge, flood risk assessment, and especially the monitoring of climate change. This network is tendered but may need optimization.

56. Groundwater modelling relies on observation wells providing constant records of water levels and hadrochemical parameters. This network needs to be strongly extended and technically upgraded to guarantee a continuous data production and transmission. Step one will be the identification of gaps in the network and planning of necessary wells; step two the selection of proper hardware for measurement and data transmission. Step three is the incorporation of the data into the database system and its permanent input into the groundwater model. Groundwater abstraction in unconsolidated aquifers can also be monitored through satellite surveillance. Both GRACE and InSAR are able to measure regional topographic changes related to groundwater abstraction. This method hitherto has not been applied to Saudi aquifers but is promising in that it will help to estimate abstraction rates even in areas not sufficiently covered by observation wells.

57. **Section.6 Climate Change:** As models on climate change can only roughly predict the regional effects, the first step needed is an updated regional model for Saudi Arabia. This will consider the records of both the MEWA and the Presidency of Meteorology and Environment (PME; actually GAMEP). The second step is a discretization of this model for individual catchment areas, on which planning of the infrastructure will be based. The third step is the construction of the remaining

about 400 dams of the 1000 dams national plan, albeit after considering the outcomes of the initial modeling. A fourth step should be the search for alternative constructions for mitigating the immediate effects of flash floods in the vicinity of villages and to prevent damage from vital infrastructure.

58. **Section 7 Secondary Water Resources:** The basic distribution of the aquifers in the Kingdom has long been established. However, water abstraction has concentrated on the most prolific aquifers, mainly those close to the surface and close to the locations, where the water was needed. With each new well drilled, knowledge about these aquifers increased, while information on those not considered remained rudimentary. Yet, these aquifers seemingly contain abundant water of varying quality. With the depletion of the "conventional" aquifers, these secondary reservoirs become increasingly more important. The first step to investigate these aquifers in more detail is an inventory of their properties. Based on that, exploration wells will have to be planned in promising areas. This planning must consider present and future economic aspects of potential exploitation. A drilling campaign with exploration wells will then establish the potential for water supply on a regional scale.

59. **Section 8 Environmental Risk:** Groundwater pollution through irrigation return flow has been demonstrated over the last decade in several groundwater studies. Consequences are increasing salt content (TDS) and contamination with nitrate. Steps needed are the optimization of irrigation volumes and the use of fertilizers plus rigid monitoring of the volumes used. Additionally, water management should establish groundwater protection zones that prevent irrigation return flow upstream of water abstraction for drinking water purposes. Zones with intensive agriculture should permanently be controlled through observation wells. Groundwater pollution through uncontrolled disposal of untreated or insufficiently treated wastewater must be prevented by an increase in the treatment capacities. Concomitantly, strict monitoring of the groundwater in the vicinity of major disposals must accompany the capacity increase. Similarly, the output of the treatment plants should permanently be controlled for water quality and potential microbial contamination.

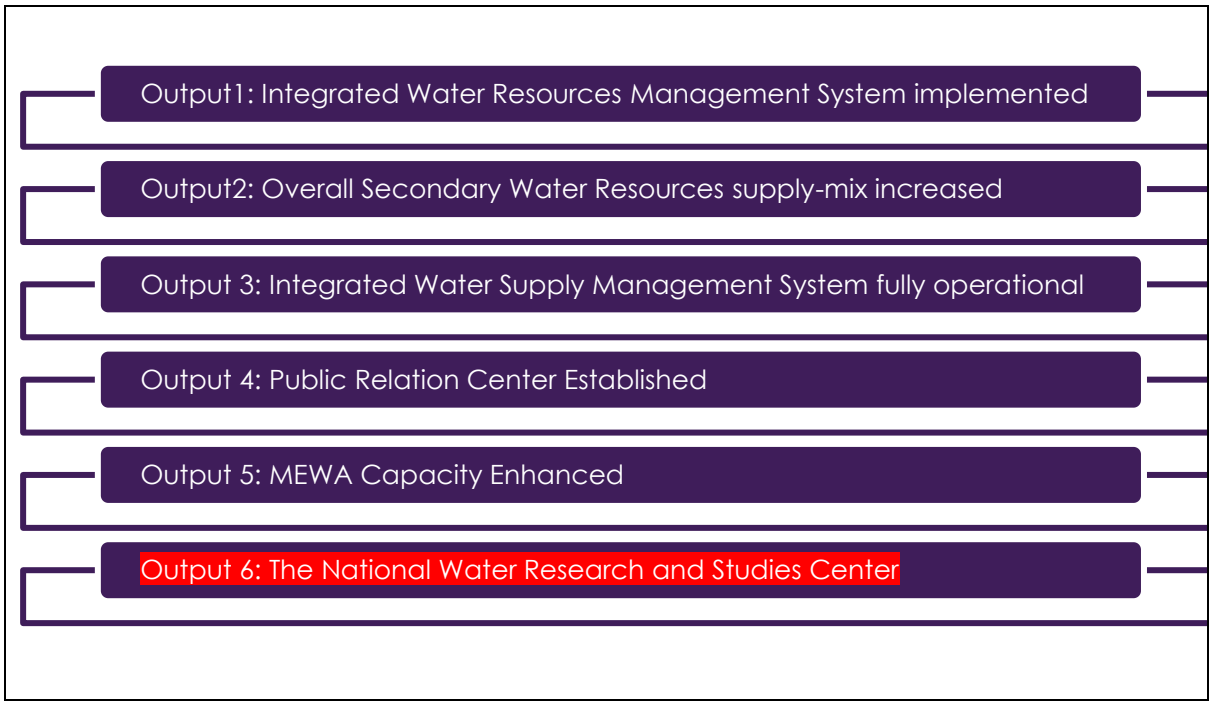
60. Besides conventional treatment plants, novel technologies such as "constructed wetlands" should be considered. The latter have much shorter construction times and strongly reduced maintenance costs during the years of operation.

61. **Section 9 Hydrothermal Energy**: For many aquifers, temperature data are available, however, mostly as point data from observation or production wells. The first step is to map temperature distribution and to model its distribution so that a spatial picture is developed. The second step is to select suitable areas based on the results of modeling and considering potential consumers. If within potential areas no wells are present, exploration wells have to be drilled. The basic technology for both shallow and deep hydrothermal exploitation is available; however, it may have to be adjusted to the harsh environmental conditions of Saudi Arabia.

62. **Section 10 Public Relations:** The entire set of measures and projects described above alone will not be overly successful without the acceptance of the public.

Hence, one of the major tasks is to raise public awareness for the limitation of the resource "water". A "Water Information Center" could take care of this task through development of educational materials, organization of permanent exhibitions considering all aspects of "Water", and courses to accompany the government's efforts in saving water, electricity, and environmental resources. At the same time, the MEWA itself will address the public through publicity campaigns in the press, TV, and in social media to intensify to underline the activities of MEWA and to increase awareness of environmental thinking and behavior in daily life.

63. Under the Results Framework of the project document, the project results are presented under 5 outputs:
    - Output1: Integrated Water Resources Management System implemented
    - Output2: Overall Secondary Water Resources supply-mix increased
    - Output 3: Integrated Water Supply Management System fully operational
    - Output 4: Public Relation Center Established
    - Output 5: MEWA Capacity Enhanced
64. The suggested changes, based on the project progress reports, include one additional output:
    - Output 6: The National Water Research and Studies Center



2.4 Project resources

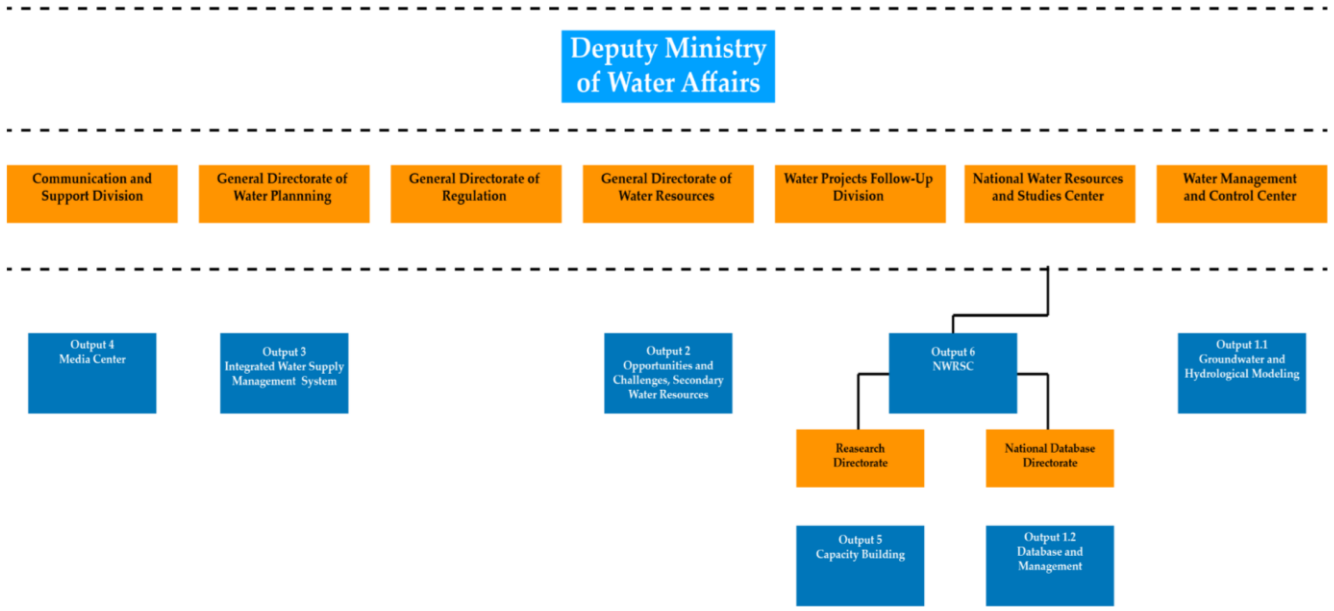
65. Financial resources: The overall funding committed to implement the project activities is $24,859,429.
66. Timeframe: The project timeframe extends for 4 years, started on 01/03/2018 to end on 8/02/2022.

67. Human Resources: The intended output of the project heavily depends on the recruitment of the experts. So far, the project recruited around 26 personnel. Some of the experts are filling technical positions, others are filling managerial positions and project management positions.

2.5 Project stakeholders

68. With the MEWA, the project activities are distributed among the key directorate under the deputy ministry of water affairs. These include: directorate of planning, directorate of regulations, directorate of water resources, communication and support division, water projects follow up division and both centers NWRSC and the Water Management and Control Center.

Figure 02: distribution of outputs to MEWA organization



69. Externally, the project document defined several stakeholders that the project will need to consider. The National Water Company (NWC) is an integral part of the water-supply chain, as it is responsible for water distribution in the main urban centers. A close cooperation with NWC is an absolute necessity to achieve sustainable water supply for the population.

70. Similarly, the Saline Water Conversion Company (SWCC) is a major partner as it provides a considerable amount of desalinated water for the national water demand. If in the process of privatization other companies will be established through outsourcing or foundation, these also will be major partners for the MEWA.

71. The Agricultural Development Fund (ADF) is an influential factor in the agricultural sector. As a partner, it will help to mediate the intentions and goals of the MEWA to the largest group of water consumers.

72. World Bank is a major player in the international business of providing management expertise through their own staff, but more importantly in coping with the financial challenges that the entire water sector faces. Especially the chances of PPP projects have to be considered. A service contract between World Bank and the MEWA has been signed.

73. Within Saudi Arabia, the major universities and research institutions will be major partners. It is intended to concentrate all research-related items in a joint institution to relieve the MEWA from the administrative burden of research activities and to profit from the scientific expertise of this university.

74. ARAMCO's water division is a large entity, hitherto unrelated to the MEWA but in possession of several thousand water wells for different purposes. With changing legislation, ARAMCO will be an important partner for the MEWA with its data helping to refine the water resources management.

75. The Armed Forces run multiple installations for water supply and treatment on their vast premises. A partnership with them is highly desirable, as both parties would benefit from this relation. The Armed Forces might get sustainable water supply, while MEWA would get data on regions hitherto not accessible.

76. Three main stakeholders are beneficiaries of all activities discussed in this proposal: The public, the agricultural industry, and the industrial sector including major mining companies. The intended national goal of protecting the natural resources, especially the stretching the groundwater reserves, will have to be communicated to the public in long-term campaigns and is addressed in the "Public Relations" chapter. Concomitantly, the costs of the provision of permanent high-quality supply of water will become evident and lead to an acceptance of water tariffs that cover at least partially the production costs.

77. As there is an inherent conflict of interest between a prospering agriculture and the necessity of water saving, a close cooperation with the agricultural industry is a prerequisite for the achievement of the goals of the water sector. In close cooperation with the Agricultural Development Fund (ADF), common workshops and annual meetings should be arranged, in which the achievements and necessities of both sectors are discussed, and common development goals are fixed.

78. A similar cooperation is intended for the heavy industry and mining industry represented by SABIC and Ma'aden, and the planning authority MODON.

2.6 Project risks

79. The project document defined three major risks are identified that will affect the Water Resources Management. First, ARAMCO has an own groundwater division taking care of the company's tremendous water demand. These data are not available to the ministry. Given that close to 600 wells are drilled annually, especially in Rub' Al Khali and the Eastern Province, Water Resources Management in these areas depends on assumptions. Second, the Armed Forces of the Kingdom use vast areas for their installations, including areas for housing of their personnel and their families (e.g. King Khalid Military City). The water demand, abstraction, and number of wells are not known.

80. Third, almost all activities of this program will be centered on and controlled by the headquarter of MEWA in Riyadh. The performance of the regional offices of MEWA is not at the standard of the headquarter. The risk is that if these offices are not entirely involved in the transformation process, they will react with resistance and low performance.

3. Evaluation Scope and Objectives

81. The Monitoring and Evaluation Policy has two overarching objectives at the project level, namely: to promote accountability for the achievement of project objectives through the assessment of results, effectiveness, processes and performance of the partners involved in the project activities; and to improve performance by the promotion of learning, feedback and knowledge sharing on results and lessons learned among the project implementers and partners, as a basis for decision-making on policies, strategies, programme management, projects and programmes.

82. Evaluation is an integral part of the UNDP project cycle. Its purpose is to provide a comprehensive and systematic account of the performance of the project by assessing its design, process of implementation, achievements (outputs, outcomes, impacts and their sustainability) against project objectives endorsed by the UNDP and government (including any agreed changes in the objectives during project implementation) and any other results.

83. Annual evaluations are set to ensure targets are met and course of action corrected when needed during the lifetime of the project. This 2019 annual evaluation, the first since the start of the project, is meant to gauge the progress of all outcomes, in terms of delivery and also in how far the indicators are being met and to recommend the changes needed.

84. The specific objectives of this evaluation are to:

    (i) Assess progress towards achieving project targets and against delivery plan as in the project document.
    (ii) Assess the appropriateness of the program design and its relevance the national priorities
    (iii) Assess the effectiveness of the project governance and stakeholders engagement strategy
    (iv) Identify emerged barriers and opportunities and facilitate project adaptive management
    (v) Generate evidence and lessons learnt based on an assessment of the first-year delivery;

85. This evaluation focuses more on process and results of first 18 months implementation, and draw on emerged issues and opportunities to enable adaptive management

86. **Evidence-based evaluation**: Evidence is essential element of the project evaluations and Mid-term reviews, the evaluation is used to collect and generate evidence to support the evaluation process by engaging relevant partners in refining the theory of change in each programmatic element, identifying causal relationships, testing assumptions, assessing specific indicators and data collection methods, processing and utilizing procedures, and defining a learning and research agenda.

87. **Evaluation domain:** The evaluation will use the OECD/DAC evaluation criteria of relevance, effectiveness, efficiency and sustainability, as defined and explained in the UNDP Handbook on Planning, Monitoring and Evaluating.

4. Evaluation approach

88. The evaluation has been undertaken in line with UNDP principles concerning independence, credibility, utility, impartiality, transparency, disclosure, ethical, participation, competencies and capacities[6]. The consultants have signed the Evaluation Consultant Code of Conduct, thereby agreeing to abide by the UNEG Code of Conduct in the UN System (2008). The evaluation was carried out by an independent, international Consultant. The terms of reference (ToR), attached as Annex 1, are based on the UNDP guidance for evaluations.

89. The evaluation process is independent of UNDP, the Ministry of Environment, Water and Agriculture (MEWA), and project partners. The opinions and recommendations in this TE are those of the Evaluator and do not necessarily reflect the position of UNDP, or any of the project stakeholders. Once accepted, the evaluation becomes a recognised and publicly accessible component of the project's documentation.

90. The evaluation was carried out between early-October (evaluation mission) and November 2019 (analysis and reporting). The field mission comprised 10 days in-country (6th October to 17th October) meeting and interviewing implementing partners, experts, beneficiaries and other key stakeholders.

91. Evaluation is an evidence-based assessment of a project's concept and design, its implementation and its outputs, outcomes and impacts as documented in the project document. Evidence was gathered by reviewing documents, interviewing key, selected stakeholders and from other ad hoc observations.

4.1 Desktop review

92. Thorough desktop reviews have been undertaken to various references. This included review of all relevant sources of information UNDP, Project Documents, project reports, lesson learned reports, national strategic and legal documents, project work plan, and any other materials that the team considers useful for this evidence-based review.

93. List of documents that were reviewed includes

- Project document (contribution agreement).
- Theory of change and results framework.
- Programme and project quality assurance reports.
- Annual workplans.
- Activity designs.
- Consolidated quarterly and annual reports.
- Results-oriented monitoring report.
- Highlights of project board meetings.
- Technical/financial monitoring reports.
- Government-related strategies and reports

94. The key output of the desktop review was to collect data and information as potential evidence that underpin evaluation, and also help the evaluator to familiarize with the project context in details.

[6] Guidance for Conducting Terminal Evaluations of UNDP-supported, UNDP Evaluation Office, 2012.

4.2 Engaging stakeholders

95. Engaging stakeholder is critical for the success of the evaluation. The project involves multi-stakeholders and teams in different capacities. Throughout the evaluation process, the following main stakeholders will be engaged and consulted:

- Ministry of Environment, Water and Agriculture (MEWA) – all directorates under the Deputy for Water Affairs
    - directorate of planning,
    - directorate of regulations,
    - directorate of water resources,
    - communication and support division,
    - water projects follow up division
    - National Center for Water Research and Studies
    - Water Management and Control Center
- World Bank
- UNDP core team
- Project Management Unit (PMU)

96. The main purpose of the engagement was to collect evidences that support evaluation process and findings and gain sufficient understanding of their perspectives on the UNDP program successes and challenges.

4.3 Evaluation criteria and ratings

97. The standard evaluation criteria according to UNDP evaluation policy are Relevance, Impact, Effectiveness, Efficiency and Sustainability. It is acknowledged the ToR defined the domain of the review under 4 domains, and here are how these domains relate to the evaluation criteria:

Evaluation Criteria	Domain
Appropriateness (relevance and design)	i. Project design/strategy ii. Relevance to national priorities iii. Alignment with UNDP strategic plan
Effectiveness	iv. Progress Towards Results Progress Towards Outcomes Analysis
Efficiency	v. Program Implementation and Adaptive Management Arrangements
Sustainability	vi. Durability of the results vii. Likelihood that outputs and outcomes will continue after the program cycle
Process	viii. Project Governance ix. Stakeholders engagement x. Delivery mechanisms

- **Relevance** concerns whether the results, purpose and overall objectives of the intervention are in line with the needs and aspirations of the beneficiaries, and with the policy environment of the intervention, within the context of this program, mainly how research topics, objectives and activities are relevant to build operational and technical national research and institutional capacities to meet the objectives of the GE conventions;

- **Impact** is the effect of the program on its wider environment, and its contribution to the wider sector objectives summarized in the program's Overall Objective, and on the achievement of the overarching policy objectives of the national institutions, GE conventions and the various partners involved. Impact includes positive and negative, primary and secondary effects produced by a development intervention on its beneficiaries, directly or indirectly, intended or unintended;
- **Effectiveness** is the contribution made by the program's results/outcomes to the achievement of the program purpose. Effectiveness describes how well the results achieved have furthered the attainment of the intervention purpose both in quality and in quantity. It includes also catalytic and synergistic effects among program components, as well as political, institutional, natural, social economic/financial, cultural factors which supported or impeded program implementation;
- **Efficiency** is used to assess if the results were obtained at reasonable cost, i.e. how well means and activities were converted into results, and the quality of the results achieved. It describes the relationship between the produced outputs and the utilized resources.
- **Process** is to assess the effectiveness of proram governance, stakeholders engagement, delivery mechanisms and decision making processes adopted by the program;
- **Sustainability** is the likelihood of a continuation in the stream of benefits produced by the program after the period of external support has ended. Key factors that impact on the likelihood of sustainability include: (i) ownership by beneficiaries; (ii) policy support/consistency; (iii) appropriate technology; (iv) environment; (v) socio-cultural issues; (vi) gender equity; (vii) institutional management capacity; and (viii) economic and financial viability.

98. The different scales for rating various criteria are shown in Table 1 below, and further defined in Table 2 (level of satisfaction scale) and Table 3 (likelihood of sustainability scale). Sustainability concerns the extent to which environmental, social and economic benefits are likely to continue from a particular project.

Table 1: Ratings and their scales for different evaluation criteria

Outcomes, Effectiveness, Efficiency, M&E, I&E Execution	Sustainability	Relevance
6. Highly Satisfactory (HS): no shortcomings **5. Satisfactory (S):** minor shortcomings **4 Moderately Satisfactory (MS):** moderate shortcomings **3. Moderately Unsatisfactory (MU):** significant shortcomings	**4. Likely (L)**: negligible risks to sustainability **3. Moderately Likely (ML)**: moderate risks **2. Moderately Unlikely (MU)**: significant risks **1. Unlikely (U):** severe risks	**2. Relevant (R)** **1. Not relevant (NR)**

2. Unsatisfactory (U): major shortcomings **1. Highly Unsatisfactory (HU**): severe shortcomings	**Additional ratings if relevant**	**Impact**
	Not Applicable (N/A) **Unable to Assess (U/A)**	**3. Significant (S)** **2. Minimal (M)** **1. Negligible (N)**

99. The project objective and outputs were rated according to their respective outputs, based on evidence provided by project teams and assessed by the Evaluator, and by means of performance indicators using the 6-point satisfaction scale (Table 2). Other aspects of performance, such as effectiveness, efficiency, relevance and sustainability, were assessed using the full set of ratings shown in Table 1 and 3.

Table 2 Definitions of ratings of levels of satisfaction

Rating	Definition
Highly Satisfactory (HS)	The project had **no shortcomings** in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.
Satisfactory (S)	The project had **minor shortcomings** in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.
Moderately Satisfactory (MS)	The project had **moderate shortcomings** in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.
Moderately Unsatisfactory (MU)	The project had **significant shortcomings** in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.
Unsatisfactory (U)	The project had **major shortcomings** in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.
Highly Unsatisfactory (U)	The project had **severe shortcomings** in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.

Table 3 Definitions of levels of risk to sustainability of Project outcomes

Rating	Definition

Likely (L)	**Negligible risks** to sustainability, with key outcomes expected to continue into the foreseeable future.
Moderately Likely (ML)	**Moderate risks**, but expectations that at least some outcomes will be sustained.
Moderately Unlikely (MU)	**Substantial risk** that key outcomes will not carry on after project closure, although some outputs and activities should carry on.
Unlikely (U)	**Severe risk** that project outcomes as well as key outputs will not be sustained.

4.4 Key Evaluation Questions

100. Key evaluation questions have been developed and categorized under evaluation domains, as follows:

Key evaluation questions
Appropriateness
- ***How does the project relate to the needs of the MEWA, and its strategic plan?*** - ***How well the program is designed?***
Effectiveness
- ***To what extent are the expected activities of the project being achieved in the first 18 months?*** - ***How is the project effective in achieving its expected outputs/outcomes?***
Process
- ***How effective the project governance, stakeholders engagement, delivery mechanisms and decision making processes adopted by the program?***
Efficiency
- ***How efficiently have the project resources been turned into results?***
Sustainability
- ***What are the probabilities that the project achievements will continue in the long run?***

4.5 Semi-structured interviews

101. Semi-structured interview is the most robust method to collect data and information about the delivery and effectiveness of the project. 26 interviews have been conducted during the evaluation mission with various stakeholders and teams (see Annex 2 for list of interviewees). Interviewees were asked open questions about their perspectives of project successes, challenges and also about their particular roles in the project. The project interviews were also used to collect detailed data and info about the project delivery.

102. All interviews were undertaken in full confidence and anonymity. The evaluation report doesn't not assign specific comments to individuals.

4.6 Data collection and analysis

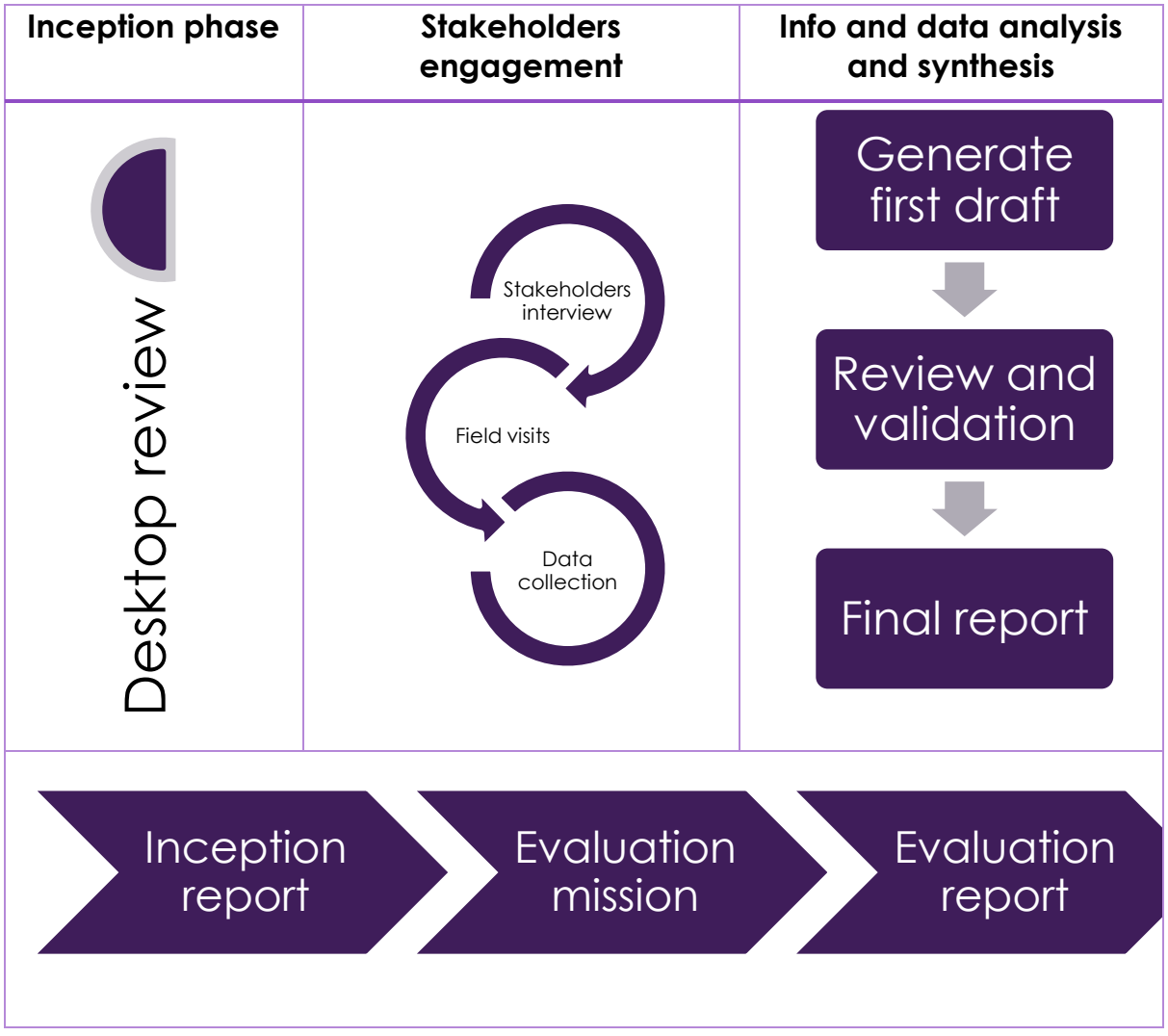
103. The project evaluation used a mixed method to collect data, which includes the following: desk reviews of key documents (such as: annual report and strategic review) and other relevant research, reference materials, interviews, and meetings with relevant stakeholders.

104. Data and information were collected via various methods, including interviews covering participants in development project, project members, as well as data review and analysis of monitoring and other data sources and methods. Information was analysed and consulted with project, and then an evaluation report draft will be developed.

4.7 Validation

105. The draft evaluation report was shared with stakeholders, and the UNDP Country Office/PMU organized circulation and feedback. Feedback received from these sessions have been taken into account as appropriate when preparing the final report.

Figure 03: Overview of the evaluation approach



5. Findings and conclusions

5.1 Appropriateness (project Design and relevance)

5.1.1 Key evaluation questions

1. How does the project relate to the needs of the MEWA, and its strategic plan?
2. How well the program is designed?

Relevance scale

2. Relevant (R)	1. Not relevant (NR)

Project design scale

6. Highly Satisfactory (HS)	5. Satisfactory (S)	4. Moderately Satisfactory (MS)	3. Moderately Unsatisfactory (MU)	2. Unsatisfactory (U)	1. Highly Unsatisfactory (HU)
no shortcomings	minor shortcomings	moderate shortcomings	significant shortcomings	major shortcomings	severe shortcomings

Overall conclusions

Evaluation domain	Overall ratings	Findings
Project relevance	Relevant	The project overall objectives and outputs are aligned to the MEWA needs and priorities, vision 2030 and UNDP priorities
Project design	Moderately Unsatisfactory	Weak design of the results framework, governance structure and risk identification and management. And the process was cumbersome and the project document was limited to be used as a "blue print" for the Implementation Team.

5.1.2 Project relevance

106. The initial project design including 5 key outputs (see above) have been reasonably justified and aligned to the MEWA needs and priorities. In principle, the objective of the project and its outputs remain as relevant today as when the project was conceived. MEWA genuinely requires capacity building outcomes in the areas covered by the project outputs, and the UNDP project was designed to deliver these outcomes.

107. The National Water Strategy (NWS) has been recently developed and aims at achieving sustainable water sector, safeguarding the natural resources and environment of the Kingdom and providing cost-effective supply and high-quality services. Efficiency contributes to economic and social development.

108. Derived from the sector's five strategic objectives, the NWS defined ten strategic programs and initiatives. **The 5 key outputs plus the additional 2 new suggested correspond with those programs defined in the NWS**. For instance, output #3b helps to achieve program #1 under the NWS through supporting

ground water use regulations and enforcement. Similarly all other outputs contribute directly to programs 2,3 and 4 under the NWS.

109. **The project outputs are also highly relevant to achieve the Vision 2030 goals the Kingdom of Saudi Arabia** and, specifically, in this case, to meet all of the SDG goals especially as pertains to this project in terms of water in Goal 6: Clean Water and Sanitation, Goal 11: Sustainable Cities and Communities, Goal 12: Responsible Consumption and Production and, Goal 13: Climate Action.

110. UNDP has identified three programme priorities for the new Country Programme Document (CPD). These are aligned with the national priorities articulated in Vision 2030, the tenth national development plan, and the UNDP strategic plan. They address areas of diversification and growth; employment and vulnerability; access to efficient public services; and non-oil natural resources management. **The project directly relevant to the pillar three and helps manage the most significant non-oil natural resource, water**.

111. **Relevance of the project outputs to the needs of the MEWA is essential for rationalizing the project**, however, a successful project design is the one that selects the right activities and bound them with a coherent governance and robust monitoring and evaluation.

112. While the **majority of activities are relevant**, it is noted that the hydrothermal energy component of the project is irrelevant to the MEWA mandates and priorities. The project stakeholders have suggested removing this component as part of the re-alignment process.

5.1.3 Project design

113. The project was designed in 2017, which arguably puts it as a "second phase" to the previous UNDP project that support the development of a National Water Strategy (NWS)[7]. At the time the NWS was not fully finalized, which meant that the project formulation was concurrent to the finalization of the NWS.

114. **Overall design of M&E framework is unsatisfactory**, the project lacks for meaningful and Specific, Measurable, Achievable, Realistic, and Time-bound (SMART) Key Performance Indicators (KPIs) that would obtain a robust evidence for the project effectiveness and efficiency. The defined KPIs in the project document are insufficiently SMART, they are repetitive, that is they were effectively tracking the same outputs.

115. **Some of the indicators were irrelevant**, for instance tracking the percentage of achieving data collection (for activity 2.6 in the original project document) doesn't provide any insight on the development of the master plan and its effectiveness. Most of the indicators, if not all, are output delivery-based, and lack for insights for the ultimate outcome anticipated in the project (i.e capacity building). The phrasing of some of the indicators was not precise enough and in a lesser project it might have been open to interpretations.

[7] UNDP Project Document, Development of the National Water Strategy

116. In the event that the project had not invested sufficiently in data collection for the right indicators, it is important to re-design the project results framework (section 5 of the project document) and establish baselines and realistic targets.

117. Governance is the means for achieving direction, control, and coordination that determines the effectiveness of management[8]. In this case effective management can be taken to mean ensuring that the interaction of people within the project are organized in such a way that achieves capacity building outcomes through implementing participatory delivery model and effective decision making.

118. **The design of the governance structure, as in the project document, is unsatisfactory and presents a significant challenge to the project delivery**. The project management has been unable to influence change in directorates over which the it has very little control and whom may have widely differing agendas and means of measuring success.

119. Below figure represents the project governance model as presented in the project document. It is noted that MEWA is the Implementing Partner with UNDP Implementation Support Services. The model doesn't separate between coordination platform and decision-making forums.

120. This required projects to work across a multiple of directorates and outputs and in areas where **there are complex external dependencies**, for example seeking funding from the NTF. Furthermore, while changes to the scope of work is often a technical challenge but it has o be accompanied with a rigorous process and coherent governance.

121. **The governance model doesn't define the roles and responsibilities between key personnel engaged in the project management**, namely the CTA, project manager and NPC. In fact the project management function is somehow scattered and missed out among these players. As well, the reporting lines between project management and output managers are also not clear, this resulted in creating multiple reporting burden for the output managers to each of the project manager, NPC and CTA, and in some cases, contradicting guidance from three project management personnel to the output managers.

122. **The UNDP experts fill senior positions at the MEWA, namely 6 out 8 directorates are managed by UNDP experts**. While this reflects the significance of UNDP experts contribution to the project and broader MEWA's work, it, however, creates two legitimate concerns for the project to address:

- A significant deviation from the original technical duties that these experts were meant to deliver on, and doing more managerial work at the expense of utilizing their technical competencies.
- The sustainability of these senior positions beyond the project timeframe, assuming the expert contracts will no longer be extended after the

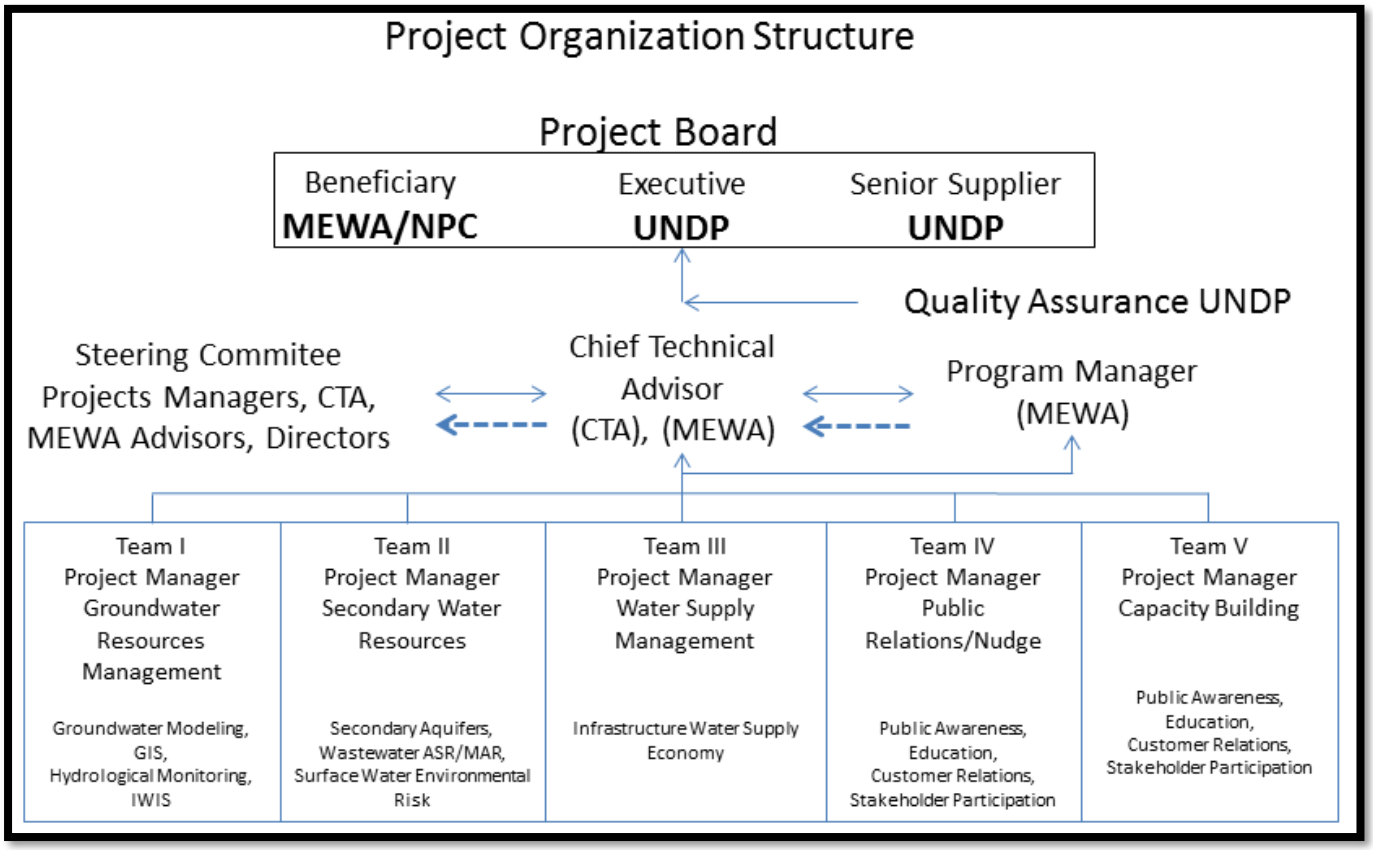
[8] Eagles, Paul F J, 2008, Governance models for parks, recreation, and tourism. In: Transforming Parks and Protected area: policy and governance in a changing world. Eds. Kevin S. Hanna, Douglas A. Clark, and D. Scott Slocombe.

project, which means that 6 directorates will be vacated from the director role with no replacement strategy in place.

123. **The governance model, as it is now, doesn't define decision making process**. It doesn't entail what decisions and who can make these decisions. In addition Deputy minister has multiple roles at different levels of decision making, further to the coordination role, the NPC also sits on the steering committee and then sits again on the project board.

124. **The project board has never been activated since the beginning of the project**, and steering committee was organised for a while and then stopped recently.

Figure 04: Project organisation structure as per the project document



125. It is evident in this evaluation that the governance is the most significant challenge to the project day to day delivery.

126. The project budget design has fairly covered the cost of the experts and project management, however, it is noted that all outputs (with exception to Output 4: Water Water Extensional Education Center) lack for operational budge (Opex). This leaves the project experts unable to outsource activities where needed, and increase the reliance on external funding, and subsequently a higher risk for not delivering.

127. Two other weakness areas were noted in the project document; **(i) lack of a clear capacity development strategy/approach; and (ii) weak sustainability strategy of project achievements**. Despite that capacity development is ultimate

goal of this project, there was limited guidance in the project document on how these capacities will be developed.

128. The capacity building is defined as the overall ability of a system to perform and sustain itself; it encompasses the acquisition of skills and knowledge for individuals, the improvements of institutional structures, mechanisms and procedures and finally the strengthening of an enabling environment (system) with adequate policies and laws. A better articulated capacity development strategy at the outset of the project would have helped the project teams to implement a more holistic approach addressing all key capacity issues; including strengthening the enabling environment.

129. Regarding the sustainability strategy, it was anticipated that the sustainability of project activities will be ensured through the direct engagement of the MEWA employee with UNDP experts to transfer knowledge and skills. It was a rather vague strategy, which did not provide much guidance on how to maximize the knowledge transfer from experts to MEWA staff.

130. Annex 2 of the project document defined project risk log, the log included 4 organisational and operational risks that the project may be challenged with. However, **the risk log lacks for key strategic risks and proper mitigation plans**. For instance, large portion of the project activities are reliant on external funding, yet this has not been identified as a risk. Some major outputs may not be delivered at all, if external funding is not secured in a timely manner, for example the master planning activity that might be funded by the NTF

131. Other examples of key risks observed in this evaluation and missed from the project design are: coordinating such a complex and multidisciplinary program, availability technically sound experts given the specific expertise required (such as modelling experts), also strategic alignment risk, and management turnover.

132. In addition, the **risk log has never been updated nor reported in the project reports**. In fact, such a complex and large-scale project requires more robust risk management plan that defines detailed mitigation plans.

133. Risk management was not addressed properly in the PD and, it seems, that it was not addressed actively by the PMU either. Therefore, the risk identification, mitigation and management are unsatisfactory.

134. On a later stage the project **needed to realign its activities** to the recently developed NWS 2030 and the initiatives of the National Transformation Plan (NTF). This required substantive changes to the project design. The effectiveness of the re-alignment process is further discussed under "efficiency" evaluation below.

5.2 Effectiveness

5.2.1 Key evaluation questions

1. To what extent are the expected activities of the project being achieved in the first 18 months?
2. How is the project effective in achieving its expected outputs/outcomes?

Effectiveness scale

6. Highly Satisfactory (HS)	5. Satisfactory (S)	4. Moderately Satisfactory (MS)	3. Moderately Unsatisfactory (MU)	2. Unsatisfactory (U)	1. Highly Unsatisfactory (HU)
no shortcomings	minor shortcomings	moderate shortcomings	significant shortcomings	major shortcomings	severe shortcomings

Overall conclusions

Evaluation domain	Overall ratings	Key findings
Project effectiveness	Moderately Satisfactory	• A moderately satisfactory progress in meeting its expected results. Anticipated activities for the first 18 months have been implemented, with portion of shortcomings. • The review of the project achievements indicates generally a strong focus on activities as opposed to developmental results (i.e capacity building). • The project has not established clear understanding of the capacity needs yet, and lacks for clear capacity building strategy to achieve the outcome • Inadequate communication of project achievements to MEWA decision makers and broader stakeholders

135. The project aims at strengthening and optimizing the technical and organizational capacities of the MEWA with respect to water resources and water supply management of the Kingdom. With the increase in tasks attributed to the MEWA and the concomitant increase in the portfolio, the MEWA personnel must be trained to meet the new challenges. The cooperation with UNDP and its provision of international experts for project work and capacity development is expected to ensure that the capability of the MEWA meets the highest standards to carry on all tasks at the best possible level.

136. **The review of project achievements indicates a moderately satisfactory progress in meeting its expected results from the beginning of the project until the time of this evaluation**. Anticipated activities for the first 18 months have been largely implemented, with some shortcomings.

137. **The project has made significant contribution to enhance water management capacity at MEWA,** that was evidently lacking prior project implementation commences. The project was able to attract water management expertise who helped to finalise the strategic plan and its indictors. Moreover, the project has established conceptual frameworks and policy briefs on water economics and how it works in KSA, environmental economy and other key water management concepts for the first time at the ministry.

138. **The project led the development of policy paper for the upcoming G20 summit in KSA titled "Fostering Sustainable and Resilient Water System Globally".** The paper proposes two major outcomes, the first being a Roadmap for the establishment of

an International Water Organization, and the second, a G20 Action Plan on Water Management. It is worth mentioning that it is the only paper, among other 70 accepted by the G20 secretariat, that was developed in house (i.e from within Government).

139. **The project helped the ministry to report on SDG 6 (sustainable water),** this included scientific analysis of the SDG indicators to be reported as part of the Voluntary National Report.

140. **The project developed water supply-demand model for the first time in Saudi.** The model is comprehensive enough to include all related parameters influencing water supply and demand, and predict changes in supply and demand over the coming 30 years. Modelling future water supplies and demand supports government to undertake coordinated, long-term water supply planning for the sustainable development across the country. The modelling started at the country level and then cascaded down to the local level covering 1517 centres across the Kingdome, this means the ministry has developed a good understanding of the water supply-demand status and future at the local level, including gaps and potential strategic solutions. Figure 05 below shows the supply-demand projections at the national level. The model now provides an intimate knowledge of all facilities that serve water abstraction, distribution, and supply to the customers.

141. **The project has developed groundwater model** that assesses the status of ground water aquifers, quantifies groundwater recharge through considering rainfall, infiltration, and evapotranspiration and predicts the effects of groundwater abstraction, for each of the major groundwater systems, an individual groundwater model has been developed during the past decade.

142. The project supported a detailed hydrological and engineering study of dams to evaluate the operational and maintenance plan as well as evaluation of sediment accumulation. These studies aim at assessing existing status of the dams, and most importantly facilitate selection of new potential sites for new dams. The selection of new sites has been informed by extensive research and modelling with an aim to maximize benefits from the dams.

143. The project implements the so called "water regulation" initiative. The initiative is funded by NTP (SRY 280 Million, and aims at installing smart meters on ground water sources, these meters will be automatically connected with a central data base. Priority was given to 1700 ground water wells that represent more than 80% of the ground water consumption by agricultural, commercial and industrial businesses.

144. The project team has also drafted regulations and licensing criteria for drinking water, which in turns determine the amount of water abstractions from wells. The project is also in process of automating all data sources and communication protocol for licensing and other data bases (SAR 23 million funding from the NTP). Nowadays, licensing drinking water industries happens completely online. 20% of the automation process is estimated to be delivered and the rest is underway.

145. As far as enforcement is concerned, the project started a process of tracking the machinery that dig water well in order to know their whereabouts and control their movements.

146. As far as the control room is concerned, the project team has brought together raw data and information from across three software used at MEWA (IPS, info-mat and hydro-manager) into one unified data base available at the intranet. The project has recently secured funding of SAR 900K from the core public funding to start with a small control room that makes live data available. The project has also secured a piece of land next to existing MEWA premise on which the new centre will be constructed.

147. **The project had little contribution towards building the capacity of MEWA to implement the NWS** (considering the broad definition of capacity as mentioned above). When considering the level of exiting MEWA capacities without the project expertise, the MEWA would not have been able to achieve what has been achieved in the first 18 months (see below the achievements). There is clear evidence of the contribution of the project to develop capacities of MEWA on matters related to implementation of the NWS priorities. For example, for the first time ever, the project delivered dynamic supply-demand model that forecasts changes in water supply and demand over the next 30 years. Other examples are detailed below.

148. The project has no clear capacity building strategy implemented in the project. There have been few training activities that were challenged with people motivations to attend the trainings. However, trainings are just one component of the capacity building sought to be achieved by the project.

149. Particularly output 2 of the project provided a good practice in delivering in job training for new MEWA staff. This involves heavy engagement between the experts and new staff, and ongoing brainstorming sessions. The director water resources department is a strong believer in such kind of capacity building and a champion of making it actually happens.

150. The ongoing capacity building activities (mainly trainings) are not based on proper capacity needs assessment. These were designed mostly based on what existing expertise can offer rather than what MEWA staff needs.

151. The trainings were highly challenged by limited (sometimes lack) of trainees' motivations to undertake the training, especially that trainings have little to do with people promotions according to the promotion system followed at the ministry.

152. Capacity building is certainly the ultimate project outcome, yet the project has not established clear understanding of the capacity needs, and lacks for clear capacity building strategy to achieve the outcome – for instance there is no active mentorship or shadowing happening between recruited experts and MEWA staff.

153. The project has started process of engaging a consultant to start assessing capacity needs and develop a capacity building strategy (currently in tendering stage). The project should have done this activity at the very beginning of the project, nonetheless, coming late better than not coming.

154. The project facilitated two scholarships awarded to two MEWA staff personnel. These however were funded from the MEWA resources not UNDP project allocations. The project is now reaching out to a local university and investigating the possibility of establishing a Diploma program targeting the MEWA staff needs. Two training workshops have been conducted by the project experts. The turn ups for those workshops have been challenging though.

155. The project is in process of tendering the capacity needs assessment to assess the personnel technical requirements of the Deputy Ministry and elaborate on a training program for the employees.

156. The review of these achievements indicates generally a strong focus on activities as opposed to developmental results (i.e capacity building). A lot of these achievements are studies, analyses, information, and training events. There are indispensable deliverables for achieving developmental results but they also remain as information products. It is clear that the long-term impact and the sustainability of these achievements depend mostly on the uptake of these achievements by key stakeholders and MEWA staff and institutional and individual capacity built within the MEWA. If these achievements are not used, the long-term impact of the project will be limited.

157. Inadequate communication of project achievements to MEWA & UNDP decision makers and broader stakeholders. There is no clear communication strategy for the project. Stakeholders, senior management and decision makers are not well-informed of the project achievements, issues and risks.

Table 04: key achievements so far at the output level

Key Planned Activities[9]	Main Achievements to date	Indicator & year 1 target	Evaluator remarks
Output1: Groundwater Resources Assessment			
1.1. Groundwater Resources Assessment and Documentation 1.1.1 Combination of existing groundwater models into 3D Model and update 1.1.2 Visualization of 3D groundwater model - GIS 1.1.3 Remote Sensing 1.1.4 Hydrochemistry 1.1.5 Desktop study for mitigation of seawater	Conduct groundwater resources assessment Conducting research on the water layers using GIS modeling The project team collected, analyzed and documented all previous models. Evaluation of Reducing the agriculture product in KSA by using Remote sensing image	50% of the integrated Groundwater Model for the Kingdom Integrated Database System (Design final Infrastructure set-up 30%)	The set-up of the integrated groundwater model is delayed, however the project has started extensive effort to set the up the groundwater model. The 50% target is unmeasurable objectively, but it can be concluded that the preparatory research is

[9] The structure of the activities presented in this table represent the new structure of outputs and activities including the new additional outputs suggested.

intrusion, e.g., TSE injection 1.1.6 Field investigation and well interpretation of secondary aquifers 1.1.7 Geology and Hydrogeology of ASR/MAR sites 1.1.8 Exploration supervision and reservoir management 1.1.9 Demarcation of Groundwater Management Zones 1.1.10 Secondary Water Resources Master Plan			progressing and need to be expedited. The data base target is underway.
Output 2: Surface and Non-Conventional Water Resources			
2.1. Secondary Water Resources; "Renewed Water" 2.1.1 Masterplan for wastewater treatment 2.1.2 Monitoring network for wastewater 2.1.3 Establishment of monitoring network in areas with potential contaminators 2.2. Effects of Climate Change; "Hydrology" 2.2.1 Atlas of potential ASR/MAR sites 2.2.2 Development of surface water harvesting installations 2.2.3 Development of hydrological model for KSA; focus on climate 2.2.4 Development of hydrological model for KSA; focus surface runoff and renewable groundwater	Conducted geological and hydrological studies for constructed dams of various types (concrete, earth fill, rock fill and underground dams). Preparation of preliminary studies of (2) surface dams in Al Nammas & Asir region. Preparation of detailed Hydrological and Engineering study to evaluate the operational and maintenance plan, as well as evaluation of sediment accumulation in Jazan dam; Jazan Regio Digital Map for distribution of Rainfall Averages (Isoheateal Map) on all KSA Establishment of a digital map for the distribution of the average rainfall of the rainy state Hydro meteorological Modelling	Inventory of all secondary aquifers 15% of the master Plan for wastewater Treatment and Reuse Share of treated wastewater in the overall supply mix of the Kingdom (60%) 100% Atlas of Potential ASR/MAR Sites Storage Capacity in BCM 25% Data collection on flood mitigation master plan	The project team delivering this output provides a good practice in delivering in job training for new MEWA staff. This involves heavy engagement between the experts and new staff, and ongoing brainstorming sessions. The director is a strong believer in such kind of capacity building and a champion of making it happens! Lack of expertise the fields of geology and hydrogeology, including all aspects of wastewater.

2.2.5 Modeling of groundwater recharge 2.2.6 Modeling of surface runoff and peak flood discharge 2.3. "Dams" 2.3.1 Dam Management Master Plan 2.3.2 Dam Operational Security Master Plan 2.3.3 Dam design, planning, and construction supervision, flood mitigation	Checked the data of the plans of treated water reuse Analysis for wastewater treatment plants (products/used/ lose) for all regions Investigating dam sites and dam constructions for flood mitigation.		Indicators cannot be measured objectively in the way they are designed. However, it can be concluded there has been quite considerable progress on the studying dams and investigating dam sites The wastewater component is lagging
Output 3a: Water Resources Management and Planning			
3.1. Water Supply System; Water Resources Management 3.1.1 Production of a water action plan identifying the main areas for efficiency improvements and potential measures to be taken 3.1.2 Implementation of NWS 2030 3.1.3 Establishment of water supply management zones 3.2. Demand and Supply 3.2.1 Master Supply Plan with logistics modeling 3.2.2 Master Plan for Hajj and Umra 3.3. Water Risk 3.3.1 Risk assessment and development of risk registry 3.3.2 Flood Mitigation Master Plan with	The project team provided technical support and oversight to the review process of the NWS KPIs and their cross reference with the KPIs for the Vision 2030. The project team has developed for the first time a supply-demand model for water resources in KSA with forecasts until 2050. The model covers water demand changes based on population growth, expected new development projects, infrastructure, Hajj and Omra and lots of other parameters, it also covers the supply forecast based on 95% coming from desalinated water and 5% from groundwater. See figure below example of supply-demand forecast for Makkah area. It is dynamic model that can be automatically changed based on	50%: Inventory 50%: Master Plan Data Collection And Planning 25% 50% of the national Water Supply Risk Registry	Indicators are not SMART enough and unmeasurable – please note progress to date explained in this table and in the text above

consideration of alternative flood mitigation constructions, together with 2.3. 3.3.3 Emergency Master Plan based on above	changing any parameter. The basic supply-demand model is 100% complete, and is in process of downscaling the model into a center level (covering more than 13 regions and 1517 center across the kingdom. The project has also produced a supply-demand document (singed by the committee). The project is seeking funding from the NTP, in doing so, the project has been successful in securing seed funding from the NTP to outsource consulting service to develop a full detailed business case and project scope to satisfy the NTP requirements. Eventually the NTP funding will be used to deliver integrated planning elements including to develop the master plan and other activities, develop data bases and information systems, emergency master plan and risk registry.		
Output 3b: Regulation and Enforcement			
3.4. Regulation 3.4.1 Implementation of a water abstraction control system 3.4.2 Establishment of licensing scheme for resource abstraction: wells, abstraction quota, etc.	The output team is implementing "water regulation" initiative. The initiative is funded by NTP (SRY 280 Million, and aims at installing smart meters on ground water sources, these meters will be automatically connected with a central data base.	No indicators defined in the project document	Overall, there seems to have quite good progress on this front. This output is however dependent on external funding and might be challenged to

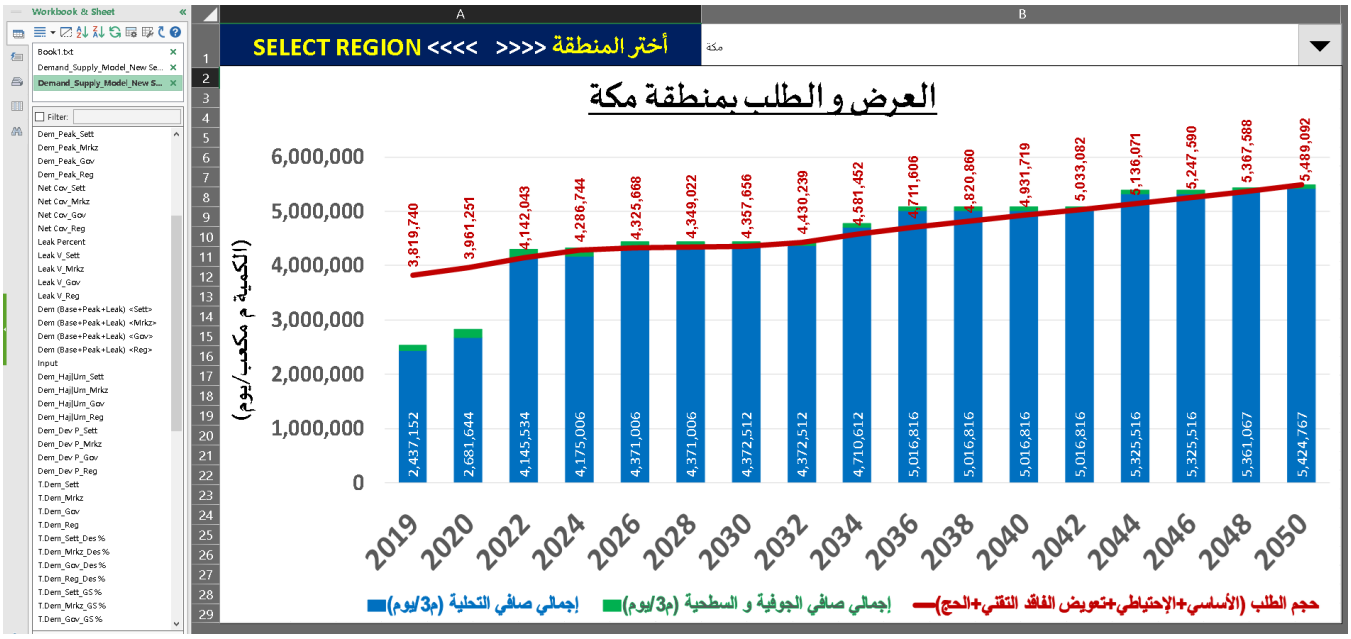
3.4.3 Implementation of enforcement mechanisms for conditions set out in the licenses	Priority was given to 1700 ground water wells that represent more than 80% of the ground water consumption by agricultural, commercial and industrial businesses. The project team has also drafted regulations and licensing criteria for drinking water businesses, which in turns determine the amount of water abstractions. The project is also in process of automating all data sources and communication protocol for licensing and other data bases (SAR 23 million funding from the NTP). Nowadays, licensing drinking water industries happens completely online. 20% of the automation process is estimated to be delivered and the rest is underway. As far as enforcement is concerned, the project started a process of tracking the machinery that dig water well in order to know their whereabouts and control their movements.		secure enough resources to complete the full automation process.
Output 4: Water Extensional Education Center			
4.1. The Center 4.1.1 Design of campaigns to raise awareness about water use efficiency and demand-side-management programs 4.1.2 Development of "Nudges" 4.1.3 Execution of campaigns	The project has developed an overall vision of the campaign and its structure, and is currently in process of engaging a specialized consulting firm to the design the campaigns. In process of establishing the center, the project developed vision, mission and goals statement for	Number of Campaigns Target year1: 2	Limited progress on this output so far, and way behind the schedule. This is may be attributed to the delay in recruiting the manager of the center as being under resourced with

4.1.4 Development of focused information material and educational material for several topics 4.1.5 Organization of temporary and permanent exhibitions topic "Water Cycle" 4.1.6 Media Spokesman (Output Manager)	the center that was approved internally and yet to be approved by Public Institutional Planning and Excellence agency. The center started to partner with, and support, companies that have water awareness-related activities as part of their Corporate Social Responsibility work. The project support included the design of the awareness material and making information available from the MEWA. Recently, the campaign design has been awarded The center team participated in Saudi Water Forum (March 2019), and Saudi Agriculture Exhibition (October 2019).		human resources required to deliver the campaigns. There is a need to define the targeted groups and key messages upfront. The design and execution of the campaigns need to be expedited. Annual target for this indicators has not been achieved.
Output 5: MEWA Capacity Enhanced			
5.1. Capacity Building 5.1.1 Scholarships 5.1.2 Technical and leadership training in-house 5.1.3 Technical and leadership training out-house 5.1.4 On-the-job training	Two scholarships have been awarded to two MEWA staff personnel. These however were funded from the MEWA resources not UNDP project allocations The project is now reaching out to a local university and investigating the possibility of establishing a Diploma program targeting the MEWA staff needs. This is anticipated to replace the scholarship activity. Two training workshops have been conducted by the project experts. The turn ups for the those	4 post graduate scholarships	The scholarship component didn't proceed as previously planned, this is may be attributed to the complexity of the process involved by the ministry. The UNDP project could have established its own guidelines for scholarship to overcome MEWA's demanding process. There is no clear vision of the

	workshops have been challenging though. The project is in process of tendering the capacity needs assessment to assess the personnel technical requirements of the Deputy Ministry and elaborate on a training program for the employees.		alternative, though the initial discussions have already happened with the university. Half of the first year target met only.
	Output 6: National Water Research and Studies Center (**NCWRS)**		
6.1 Establishment of the NCWRS 6.1.1 Operationalizatio n, Business Plan, Research Strategy 6.2 Studies and Research 6.2.1. Execution of new studies on topics of the UNDP Project 6.2.2. Technical studies (field investigations and laboratory analysis) of studies 6.2.3. Cooperations with outside institutions and Centers of Excellence 6.3 Database 6.3.1 Setup of database system with data model and data migration plan 6.3.2 Data migration and update of database with all relevant data 6.4 Environmental Risk 6.4.1 Evaluation of soil and bedrock geology and hydrogeology for	The project team delivered key milestones in establishing the center. The project supported development of regulatory Statutes that legalize and regulates the work under the center. Also an operational and procedural guidelines have been developed for the center. Research priority activites have been defined in line with the MEWA and NWS needs. The center has developed a policy paper for the upcoming G20 summit in KSA titled "Fostering Sustainable and Resilient Water System Globally". It is worth mentioning that it is the only paper, among other 70 accepted by the G20 secretariat, that was developed in house (i.e from within Government). The center team has supported the SDG6 performance assessment. The center team has also developed concept brief for MEWA on "Application of water	No indicators defined	The center is under-resourced. Absolutely no funding to implement research and limited human resources. The center team has been dragged to do much of the management work (including reviewing technical material produced by others) at the expense of delivering the business plan. As a result, there yet no single research produced

nuclear waste disposal sites 6.4.2 Demarcation of nuclear waste disposal sites	economics in KSA" and "Environmental Economy".		
	Output 7: Water Management and Control Center		
7.1 Center for Water Management and Control (CWMC) 7.1.1 Operationalization, Business Plan 7.1.2 Data migration and update of database with all relevant data	The project team has brought together raw data and information from across three software used at MEWA (IPS, info-mat and hydro-manager) into one unified data base available at the intranet. The project has recently secured funding of SAR 900K from the core public funding to start with a small control room that makes live data available. The project has also secured a piece of land next to existing MEWA premise on which the new center will be constructed.	No indicators defined	Some progress have been done here. The project needs to apply rigorous data quality check before being migrated and/or accepted into the new data base.

Figure 05: A snapshot from the model shows supply and demand forecast for Makkah area over the coming 30 years.



5.3 Process

5.3.1 Key evaluation questions

1. *How effective the project governance, stakeholders engagement, delivery mechanisms and decision making processes adopted by the program?*

Process scale

6. Highly Satisfactory (HS)	5. Satisfactory (S)	4. Moderately Satisfactory (MS)	3. Moderately Unsatisfactory (MU)	2. Unsatisfactory (U)	1. Highly Unsatisfactory (HU)
no shortcomings	minor shortcomings	moderate shortcomings	significant shortcomings	major shortcomings	severe shortcomings

Overall conclusions

Evaluation domain	Overall ratings	Findings
Project process	Moderately unsatisfactory	• Limited application of adaptive management approach to capture emerging opportunities and overcome faced barriers. For instance, the project recognized the need to re-design the scope and management arrangements, but had not implemented the review process according to standard project management requirements. • The current management arrangements are ineffective. These are largely the result of ambiguities in the original project design (the

		Project Document) and ad hoc arrangements in the different components of the project. • Six project experts are performing a general director role at MEWA, in a director capacity, the experts' time is dedicated to undertake managerial tasks at the expense of the technical input. In addition, the sustainability risk that this model brings is not addressed in project delivery and monitoring. • The project teams have limited knowledge and experience in project management basics and skills that are intrinsic to the successful project delivery, such as project monitoring, reporting, risk management, and outsourcing consulting services.

5.3.2 Adaptive management

158. Adaptive management are changes made to the project in order to still achieve the outcomes and objective. It is an approach to secure project deliverables while maintaining adherence to the overall project design. Adaptive management enables the project to capture emerging opportunities and overcome faced barriers.

159. The project team realised the need to review project scope early on, this included reviewing the outputs and activities. The project scope has undergone through substantive changes in scope, this includes adding two new outputs, eliminating some activities (hydrothermal component) and rearranging activities under other outputs. The change is fairly justified by the need to better align the project to the MEWA needs, structure and more importantly the newly developed NWS.

160. While these proposed changes fall in the "make sense" basket, however, the project scope review process has not been bound by adequate framework in terms of understanding the implication of the changes on the overall project design including project results framework, project risks log, and costing. Also, there is no governance arrangements agreed to make decisions on the review component. Obviously the project board is not consulted until this point.

161. The project has been able to identify the key barriers faced, an adaptive management needed to identify a problem and act with confidence and speed, something which requires considerable trust and confidence in a complex, multi-partner project. The project management didn't get enough support by all involved in the decision-making process before the they can act. This would have helped the project to be capable of resolving problems and acting intelligently even in the face of uncertainty.

162. A common practice in project management is to go through an inception phase for the first three months of the project lifetime. The inception phase allows to implement the first adaptive management tool and validate the project design prior actual implementation starts. It helps addressing the adaptive management challenges inherent in the project design. An inception phase, and ultimately an inception report, was inevitably needed for this particular project, in fact, it would have allowed for capturing the key issues and resolved them early on.

163. A more structured and explicit approach to addressing an adaptive challenge in the Project Document would have saved time and resources, including human effort, which should not be underestimated as resource critical to the success of this project.

5.3.3 Management approach

164. This project is administered from the Head Office of the Ministry of Environment, Water and Agriculture (MEWA) in addition to the UNDP's Implementation Support Services are provided from the Country Office.

165. As indicated under section 5.3.1, the project has been suffering from poor governance design. The project steering committee was active for some time and then was put on hold, there has been less appetite to participate in the steering committee. The steering committee brings together the project management team and directors of directorate and UNDP quality assurance team. The committee however has no clear mandate, it looks as though more of coordination platform and doesn't involve "steering" as opposed to decision making.

166. The current arrangements are largely the result of ambiguities in the original project design (the Project Document) and ad hoc arrangements in the different components of the project. It is evident that these arrangements have not worked effectively given the chaotic circumstances in the first year and a half of project execution. These arrangements have resulted in inefficiencies.

167. As a result of the poor governance design (section 5.3.1), the decision-making process has been mostly made individually by the project management team members (NPC, PM, CTA) with limited effective participatory decision-making approach. Roles and responsibilities among project management team are not clear enough, it is noted that duties clearly overlap.

168. Project monitoring and reporting function is an example where project management duties overlap, and as a result miss-coordinated, between the project management members. While this function is typically the responsibility of the project manager, however the project document assigns this to the CTA. The project document indicates "A *Chief Technical Advisor will be appointed to manage his/her own component as well as oversee all technical project activities, monitor progress and report to both MEWA and UNDP via quarterly and annually progress reports*". This resulted in deviating the focus of the CTA from technical work into major administrative work.

169. Coordination and engagement in this project are seen at three levels,

a) Technical level: this involves coordination of the project activities level and make sure that project teams are aware of each other's work, identify efficiencies and avoid duplication.

b) At the project operation level: this includes coordination among the members of the project management team (NPC, CTA & PM), this coordination help to achieve participatory decision making.

c) At the strategic level (project board): where seniors of the MEWA and UNDP meet to guide the project strategically and make strategic decisions such as project change of scope, approving work plan and budget, etc.

170. The "steering committee" has facilitated the coordination at the first level (i.e the technical level) for sometime, and there is limited coordination at both second and third levels. Particularly the project board has not been activated at all.

171. The project teams have limited knowledge and experience in project management basics, skills, such as project monitoring, reporting, risk management, and outsourcing consulting services, are intrinsic to the successful project delivery.

172. The UNDP experts fill senior positions at the MEWA, namely 6 out 8 directorates are managed by UNDP experts. While this reflects the significance of UNDP expert's contribution to the project and broader MEWA's work, it, however, creates two legitimate concerns for the project to address.

- A significant deviation from the original technical duties that these experts were meant to deliver on, and doing more managerial work at the expense of utilizing their technical competencies.
- The sustainability of these senior positions beyond the project timeframe, assuming the expert contracts will no longer be extended after the project, which means that 6 directorates will be vacated from the director role with no replacement strategy in place.

173. The review indicates that the day-to-day management of the project was much activity-based as opposed to be more results-based (RBM). This focus on activities has been driven by the design that is much activity-based. As a result, the project technical resources (CTA and experts) have been driven towards more administrative tasks.

174. The project experts are assigned to multiple tasks, often outside their original mandate as defined in their terms of reference, and this potentially causes delay in delivering project activities.

175. There have been some ambiguities concerning the recruiting process of the project experts, such as:

- On what basis the number of experts for each output has been determined
- The extent to which the experts background and experience matches the required tasks
- The terms of reference of the experts are rather generic and leave rooms for subjective interpretations
- The contract modality for experts engagement, full time jobs versus short term assignments.

176. The MEWA senior management is unaware of the UNDP working modality and services that it could provide to the project, including UNDP procurement and recruitment advantages. In fact, it has been noted by interviewees of the MEWA

that UNDP (referring to the country office) had little contribution to the project decision making and daily business.

177. UNDP's comparative advantage must be viewed through the complex nature of the project and the difficulties it has encountered particularly related to the management arrangements and governance and balance the degree of the autonomy and ownership vs quality assurance and support services.

5.3.4 Partnerships

178. The project acknowledges the significance of establishing number of external partnerships for the success of the project, including with the National Water Company (NWC), the National Water Conversion Company (SWCC), the Agricultural Development Fund (ADF), ARAMCO and local universities. These partnerships were not initiated/activated yet.

179. The project indicated that NWC is an integral part of the water-supply chain, as it is responsible for water distribution in the main urban centers. A close cooperation with NWC is an absolute necessity to achieve sustainable water supply for the population. This partnership has not been activated yet despite the genuine opportunities for both parties on a win-win basis. For instance, the are strong opportunity for the Water Extensional Education Center to partner with the National Water Company's awareness program that has been delivering awareness outcomes in water sector for quit lone time, this is a genuine opportunity to benefit from their extensive experience and existing guidelines.

180. There are multiple opportunities for establishing effective partnerships beyond the MEWA boundaries, those partnership would achieve efficiencies, integration and possibly cost sharing.

181. The NCWRS already started to look for partnership opportunities with local universities in Saudi to deliver research of mutual interest and capacity building activities for the MEWA staff. This is particularly helpful given that the centre lacks for opex financial resources to operationalise the research agenda, however none of these partnerships have materialised yet due to lack of resources sharing strategies, and lack of the opex resources to enable cost sharing

5.4 Efficiency

5.4.1 Key evaluation questions

1. How efficiently have the project resources been turned into results?

Efficiency scale

6. Highly Satisfactory (HS)	5. Satisfactory (S)	4. Moderately Satisfactory (MS)	3. Moderately Unsatisfactory (MU)	2. Unsatisfactory (U)	1. Highly Unsatisfactory (HU)
no shortcomings	minor shortcomings	moderate shortcomings	significant shortcomings	major shortcomings	severe shortcomings

Overall conclusions

Evaluation domain	Overall ratings	Findings
Project efficiency	Moderately satisfactory	• The project is largely reliant on external funding sources to implement its activities and no clear resource mobilization plan outlining funding alternatives – should the NTF funding fails. • Key project outputs are under-resourced, mainly the NCWRS and Water Extensional Education Center. • The project failed to obtain the required hardware and software to undertake the highly technical modelling work. • The project is going through s budget deficit of ~$1 mil, mainly due to hiring more experts than originally planned to.

182. This Section presents findings on the efficiency of the project that is a measure of the productivity of the project intervention process. It reviews to what degree achievements derived from an efficient use of financial, human and material resources

183. The total budget for the project was set out in the Project Document and gives a total budget of US$ 24,850,429.00, equivalent to SAR 93,189,108.75. The budget is largely allocated to cover project teams expert cost, with few opex resources available for the Water Extensional Education Center and scholarship program.

184. The opex resources required to operationalise the project activities are to be funded either by MEWA recurrent public funding or by the National Transformation Plan (NTP) under vision 2030. The NTP aims achieving Governmental Operational Excellence, Improving Economic Enablers, and Enhancing Living Standards through:

- Accelerating the implementation of primary and digital infrastructure projects.
- Engaging stakeholders in identifying challenges, co-creating solutions, and contributing to the implementation of the program's initiatives.

185. Particularly output #3 is highly dependent on funding from the NTP. The funding process seems quite challenging and demanding from the project team perspective. So far the project team secured SAR 280 Million from the NTP to implement the "water regulation" initiative. The project is also in process of seeking extra funds from NTP to implement the automation of all data sources and communication protocol for licensing and other data bases (SAR 23 million), of which the project has been successful in securing seed funding to outsource consulting service to develop a full detailed business case and project scope to satisfy the NTP requirements.

186. Some of the project outputs are still largely under-resourced to operationalise its agenda, for example the NWCRS have only 4 personnel assigned to deliver ambitious research agenda with little chances of outsourcing research activities due to lack of funding.

187. The project teams are also challenged to find proper office spaces and equipment. Some of the project experts have been, and some are still, using their personal laptops including the project CTA. Others are struggling to find a convenient office to work at.

188. The project experts were challenged to obtain hardware and software required to undertake the work. Modelling work often requires sophisticated software and hardware with relatively high specifications. The project experts have set up the specifications and handed them over to the procurement at MEWA, unfortunately the specifications were changed prior purchase without experts being consulted.

189. The project developed sets of ToRs for different experts required across different components, however the project ended up recruiting more experts than planned to and more than might be required irrespective to the original budget and allocations. This resulted in budget deficits. The need for hiring full time consultant was not clearly established, some of the assignments could have been done through short term consultancy, and not necessarily needing a full-time job. The distribution of the project experts across the different department will need to achieve the right balance.

190. The project is going through a budget deficit (~USD -1.073.258,00 $ mil) resulted mainly due to hiring more experts than were originally planned as well as deviation of many salaries from the salary range +/- 25% as estimated in the original contract. The project CTA has developed deficit mitigation plan basically by reducing allocations for scholarship grants and carry over left over budget from year 1 and phase 1 of the project.

Table 05: overview of the budget deficit of the first three years in the project.

Budget Balance			
Actual Balance	effective	budgeted	total
year 1	3.189.085,50 $	3.750.000,00 $	560.914,50 $
year 2	3.876.168,50 $	2.454.000,00 $	-1.422.168,50 $
year 3	3.914.004,00 $	3.702.000,00 $	-212.004,00 $
Total			-1.073.258,00 $

5.5 sustainability

5.5.1 Key evaluation questions

2. *What are the probabilities that the project achievements will continue in the long run?*

Sustainability scale

4. Likely (L)	3. Moderately Likely (ML)	2. Moderately Unlikely (MU)	1. Unlikely (U)
Negligible risks to sustainability	Moderate risks	significant risks	severe risks

Overall conclusions

Evaluation domain	Overall ratings	Findings
Project sustainability	Moderately Likely	• There are key concerns over the sustainability of the program results, especially in terms of skills and knowledge transfer from experts to the MEWA staff, and MEWA ability to run the business beyond the project. • The project document has no discussion on sustainability and how it should be secured through project results. • The outcomes of groundwater regulations and enforcement component will likely sustain beyond the project. • The MEWA sees the project valid and relevant and therefore participate in and own the project activities. • The financial sustainability of the project is uncertain in light of the funding dependencies and ambiguities of the project resources gaps and mobilization plan.

191. The Sustainability defined as "is the likelihood of a continuation in the stream of benefits produced by the program after the period of external support has ended. Key factors that impact on the likelihood of sustainability include: (i) ownership by beneficiaries; (ii) policy support/consistency; (iii) appropriate technology; (iv) environment; (v) socio-cultural issues; (vi) gender equity; (vii) institutional management capacity; and (viii) economic and financial viability[10]".

192. The project document has no discussion on sustainability and how it should be secured through project results. However, some elements that could strengthen the project's sustainability could be inferred indirectly, such as: (1) project was designed in relatively close consultation with key stakeholders; (2) it had the support of the participating governments and other key stakeholders; (3) it is linked with major initiative; (4) project results were supposed to be mainstreamed into water planning and management; and (5) emphasis on developing institutional and individual capacity.

193. The elements of the project sustainability are essentially grounded on capacity building, stakeholders participation and support, research infrastructure as well as regulations and their enforcement mechanisms. The evaluation indicates that sustainability of project achievements should be ensured; mostly through the transfer of knowledge and capacity to the MEWA. It was noted in section 5.1.3 of this report that the sustainability strategy of project achievements.

194. The knowledge & skills transfer from recruited experts to the MEWA staff is the cornerstone of capacity building in this project. However, the experts have been too occupied to deliver different tasks with little time left to build the capacity of the MEA staff. There is no clear exit strategy for the project.

[10] UNDP Monitoring end Evaluation guidelines.

195. As discussed in section 5.2, the project has yet not defined the key capacity needs, and no capacity development strategy in place. This generates concerns over the sustainability of the program results in terms of the MEWA ability to run the business beyond the project. Therefore, the sustainability of the capacity building component is seen as **moderately unlikely** in light of the current situation and if no strong action is taken (see recommendation section).

196. The groundwater regulations and enforcement are an important outcome that will continue beyond the project. The automation of the licensing system is another element that will ensure continuity in the enforcement and regulations of ground water wells. The sustainability of this aspect of the project is **likely**.

197. The financial sustainability of the project imposes a key concern that needs to be addressed. The project core activities are dependant on external funding, and some activities have no funding strategy at all. The funding gaps are not clear enough for project management, and accordingly no plans to address these gaps. The outcomes and eventual impact of the project are highly dependent on continued financial investment, and the project teams acknowledge the need to mobilise resources. The financial sustainability is therefore rated as **moderately likely**.

198. During the interviews, MEWA demonstrated commitment to achieve participate in and achieve project activities, MEWA acknowledges that this project is an important and critical to achieve the ministry's NWS. The project stakeholders are actively participating in the implementation of the and developed a good ownership of the programme and of its achievements, despite the miscoordination issues discussed above. The sustainability of stakeholders ownership and participation is rated **likely**.

199. The project had invested in establishing software and hardware assets required for modelling research and related GIS work. As noted under section 5.4, the project experts defined specifications of software and hardware required to undertake the research but the project but unfortunately MEWA purchased software and hardware with specifications way less that required for the modelling work. These assets are essential element of the project sustainability that would continue delivering important services beyond the project. The sustainability of the technology deployment is rated as **moderately likely**.

200. Overall, the sustainability of the project is rated as **Moderately Likely**. This means that moderate risks to the sustainability of the project's results exist.

6. Recommendations

201. Based upon its findings and conclusions the evaluation makes the following recommendations:

Recommendation #1: Undertake a substantive review of the project document.

202. The review of the project would mainly aim at:

- Documenting the change of scope and its subsequent implication on other project aspects such as budgeting.

- Developing a new governance model and management arrangements and address the gaps identified in this evaluation, mainly as related coordination and decision making mechanisms.
- Re-design the M&E framework, including development of new SMART indicators that would obtain a robust evidence for the project intent (i.e capacity building) effectiveness and efficiency.
- Develop a new risk log that identifies emerging risks and mitigation strategies.
- Review the project outputs needs of experts and suggest resources allocations to each output including advice on the contracting modality (e,g full time expert vs short time assignment).

Recommendation #2: Identify capacity needs and develop a capacity building plan

203. Despite the delay, the project team has recently developed a ToR to assess the capacity needs, this is now going through tendering process. It is important that this component is looked through carefully by identify the individual and institutional capacity needs in a systematic approach, and most importantly to be followed by a capacity building strategy that provides wide range of capacity building activities customised to address the priority needs, including means that ensure transfer of skills and knowledge such as mentorship or shadowing happening between recruited experts and MEWA staff.

204. The evaluation indicated that the sustainability of project achievements should be ensured, particularly due to the strong national ownership of these achievements. Most achievements are already institutionalized, which is an excellent first step toward sustainability. However, the project needs to define its exit strategy after the project ends including extension scenarios and how the MEWA would be able to run its business beyond the project.

Recommendation #3: Re-structure the project management unit with an intent to enhance the project management capacity and streamline decision making process.

205. This should include supporting the PMU with strong project management capacities, clarifying project management duties clearly between the PMU members (PM, CTA, and NPC), and enabling the deputy minister to perform higher strategic role in the project decision making and governance.

206. In order to fill the project management gap, it might be feasible to create a new position of a National Project Director (NPD) who reports directly to the deputy minister (the NPC) and directly manage the project manager and the CTA. The project director will need to be highly competent in applying UNDP project management framework and strong coordination and communication skills, the project director will have an overall responsibility for project-managing the entire project, implementing governance arrangements and coordinate the project delivery across the project teams and UNDP. This creates a hierarchical reporting

lines in the project and enables the CTA and other technical experts to be more dedicated towards the technical aspects. This suggestion needs, however, to be investigated prior adoption, and after the understanding of the budget implications.

207. Coordination and engagement in this project are seen at three levels,

d) Technical level: this involves coordination of the project activities level and make sure that project teams are aware of each other's work, identify efficiencies and avoid duplication.

e) At the project operation level: this includes coordination among the members of the project management team (NPC, CTA & PM), this coordination helps to achieve participatory decision making at the operational level.

f) At the strategic level (project board): where seniors of the MEWA and UNDP meet to guide the project strategically and make strategic decisions such as project change of scope, approving work plan and budget, etc.

Recommendation #4: Re-activate the project board and project coordination group (currently called steering committee)

208. This project board is critically crucial in influencing the strategic directions of the project. The board is a strong governance platform to make on consensus-based management decisions for a project, provide strategic guidance and help to overcome risks. It is important to convene the project board with the same composition as described in the project document, at least, twice a year. The project board is particularly needed to oversee the implementation of the recommendation in this evaluation.

209. It is also recommended that the project steering committee ToR is reviewed with an intent to make this a coordination platform only and no decision making, this may require to call it as Project Coordination Group (PCG) for technical coordination, harmonization, communication and linkages. The PCG should meet, at least, on a monthly basis to ensure proper coordination happening.

Recommendation #5: UNDP to support the project with communication expertise.

210. It is obvious that there is inadequate communication of project achievements to MEWA decision makers and broader stakeholders. It is understood that UNDP CO has recently established a communication capacity to support various programs, and it is highly recommended that a communication specialist supports the PMU to communicate the project achievements appropriately and effectively.

Recommendation #6: Upgrade the software and hardware assets to meet the modelling technical requirements

211. The project failed to obtain the required hardware and software to undertake the highly technical modelling work, as this is essential to undertake the modelling work on ongoing basis, it is recommended to invest in such a foundational basis to deliver high quality product and upgrade the already purchased software and hardware, and if required, buy a new ones.

Recommendation #7: assess the project financial needs and develop a resource mobilisation plan

212. As noted in the evaluation, the project offers relatively limited resources comparing to the scale of the activities. The project is highly dependent on external funding, in some cases, non-recurrent public funding. It is recommended to assess the funding gaps, map funding opportunities and develop resource mobilisation plan including scenarios for securing the required funding.

Recommendation #8: review the project resourcing strategy and ToRs of all experts and address the deficit

213. It is recommended to undertake a holistic review of all experts ToRs to be more driven by the needs under each output, and balance the experts allocations to different outputs as well as review the expert engagement modality including short-term assignment in case if the sought deliverables don't necessarily need a full time-job.

214. In light of these proposed changes in experts engagement modalities and other changes in resourcing strategy, the budget deficit need to be addressed as well.

Recommendation #9: Design fit-for-purpose reporting templates with a greater focus on the M&E framework – including the performance indicators.

215. The monitoring template used by the project includes a long list of questions - in addition to the reporting on performance indicators - that need to be answered to complete a semi-annual monitoring report. It is too time consuming, cumbersome to complete and the result is that it does not provide accurate and timely information on how the project is progressing. There is a need to review the reporting template, to shorten it and focus on the performance framework with the set of indicators as the central part to measure how well the project is progressing toward the achievement of its expected outputs and outcomes.

216. On that front, it is important to guide the project management to deliver fit-for-purpose reporting. For example, developing **a 1-page dashboard reporting template** targeting decision makers.

7. Lessons

217. This evaluation has highlighted a number of good practices as well as problems encountered that provide potentially useful lessons for other projects implemented by UNDP CO. Based on the review of project documents, interviews and meetings with key informants, and the analysis of this information, the Evaluator collated several lessons learned that are presented below:

- **Adaptive management and the project cycle should be clearly understood**. Absence of adaptive and agile project management approach leads to further complicate the barriers and missing the change opportunities. The inception phase is the first opportunity to review the current status of the project and to determine whether circumstances have changed against the assumptions made in the

Project Document. The inception phase should have the confidence and authority to significantly challenge the project's design and not to accept it as a fait accompli. The role of an inception phase that could have been utilised to allow for validating the project design prior actual implementation starts. It would have helped addressing the deficiencies in the project design. Such a project needed a defined inception phase at start up to review the design elements, engage stakeholders. Any changes to the programme strategy, management arrangements, monitoring framework and participation of stakeholders should be documented in an inception report, which should be endorsed by the management committee overseeing the development of the programme/project.

- **Project governance and management arrangements are critical to the successful outcome of a project**. Much of the confusion surrounding the management arrangements in the project appear to have stemmed from imprecise instructions in the Project Document. Deficiencies in project governance design lead to severe delivery risks. This was evidently the case with this project where governance was largely ineffective and highly influenced the decision making and day to day business.
- **Projects need to balance the focus on activities versus the developmental results**. Generating high quality products and services may not be enough, unless achieving the ultimate intended outcome (i.e capacity building). In case of this project, there are significant achievement mainly studies, analyses, information, and training events. There are indispensable deliverables but they also remain as information products, unless stakeholders uptake these information, used it and build the capacity, the long-term impact of the project will be limited.

Annexes

Annex 1: Evaluation Terms of reference

Sustainable Development and Integrated Water Management - Annual Project Evaluation

Location :	Riyadh, SAUDI ARABIA
Application Deadline :	15-Jun-19 **(Midnight New York, USA)**
Type of Contract :	Individual Contract
Post Level :	International Consultant
Languages Required :	Arabic English
Starting Date : (date when the selected candidate is expected to start)	01-Jul-2019
Duration of Initial Contract :	2 months

1. Background and context

With a rapidly growing population of presently close to 32 million, the Kingdom of Saudi Arabia faces a number of challenges including growing urbanization and environmental change. While urbanization poses great pressure on regional water and sewage infrastructure and bears pollution risks, environmental challenges include depletion of aquifers and increasing torrential flood risks. Earning relatively high annual revenues from natural resources, Saudi Arabia has invested heavily in development and upgrading infrastructure during the past few decades, including in water and sewage infrastructure, road networks, housing, hospitals, and schools.

Due to Ministry of Environment, Water and Agriculture's (MEWA) 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.

Nevertheless, a set of bolstering measures towards sustainable water supply even in stress and emergency situations and minimizing the climatically induced environmental risks needs to be formulated. These actions or interventions simultaneously should target the supply side; curtail water demands in various productive sectors; and mitigate the environmental risks.

However, to make a transition from the current patterns of water administration to sound water management mode, ***two prerequisites are required***. First, there is strong need to strengthen the technical and organizational capacities of the MEWA to deal

with the triple challenge of water exploitation and distribution (operational side), research for additional resources and cutting-edge technologies to satisfy the increasing demand (research side), and rigid control and administration of all water-related aspects (control side). Second, a sound information base covering data on groundwater availability, quality, withdrawal, and usage is about to be put in place.

The transformation of this information into an all-encompassing water resources management requires sustained long-term efforts, especially since the MEWA has limited capacity and experience in this field. 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.

To this effect MEWA partnered with UNDP Country Office to address challenges being faced in capacity development and strengthening institutional role of the Ministry. The project has been designed to initiate a systematic process of capacity development to help in sustainable development of water resources and management of water-related affairs in the Kingdom to ensure permanent and sufficient supply.

Annual evaluations are set within this project document to ensure targets are met and course of action corrected when needed during the lifetime of the project. This 2019 annual evaluation, the first since the start of the project, is meant to gauge the progress of all outcomes, in terms of delivery and also in how far the indicators are being met and to recommend the changes needed.

This intervention requires working with all heads of departments involved with the various outcomes as well as all consultants on the project and other relevant project and ministry staff.

The evaluation will take place in Riyadh, within the offices of MEWA but may require meetings with various national stakeholders .

Basic Project information can also be included in table format as follows:

PROJECT/OUTCOME INFORMATION		
Project/outcome title	Sustainable Development and Integrated Water Management	
Atlas ID	SAU10/107888	
Corporate outcome and output	National Capacities Developed for Better Management of Non-oil Natural Resources	
Country	Saudi Arabia	
Region	RBAS	
Date project document signed	20/02/2018	
Project dates	**Start**	**Planned end**
	01/03/2018	28/02/2022

Project budget	**$24,859,429**
Project expenditure at the time of evaluation	
Funding source	**Government Cost-Sharing**
Implementing party[11]	**Ministry of Environment, Water and Agriculture**

2. Evaluation purpose, scope and objectives

This first evaluation is being conducted at the end of the first year of the lifecycle of this project to ensure outputs are well planned and will achieve intended targets within the timeframe intended. The evaluation will also advise on future direction of the project. The project management will, accordingly, take into consideration the findings to change the course of the project, if needed, in terms of revising outputs, changing timeframes, altering human resources and/or budgeting.

Scope and objectives of the evaluation:

- This evaluation will cover all outcomes of the project documents. It will delve into the details of the achievements this far attained, how these feed into the final target (or fail to do so) and how best to change the course, if need be, to produce the results required. An impact assessment of the work done thus far is needed to justify continuing some or all components of the project as they stand or changing the design of one or more components for better results.
- Some concerns regarding delays in the delivery of one or more components of the project have arisen and a strong concern with regard to budgeting is being discussed
- Coordination amongst all project components has also been a matter of concern
- This evaluation will cover all activities held during the first year of the project and highlight issues and recommendations in all aspects (technical, financial, management, structural and operational), including the effective use f of resources and delivery outputs in the signed project document and workplan
- The evaluation will suggest way forward for better planning to achieve the intended results

Issues relate directly to the questions the evaluation must answer so that users will have the information they need for pending decisions or action. An issue may concern the relevance, efficiency, effectiveness or sustainability of the intervention. The direct and indirect impacts are to be highlighted. In addition, UNDP evaluations must address how the intervention sought to strengthen the application of the rights-based approach and mainstream gender in development efforts.

3. Evaluation criteria and key guiding questions

Evaluation questions define the information that the evaluation will generate. This section proposes the questions that, when answered, will give intended users of the evaluation the information they seek in order to make decisions, take action or add to knowledge. Questions should be grouped according to the four OECD-DAC evaluation criteria: (a) relevance; (b) effectiveness; (c) efficiency; and (d) sustainability (and/or other criteria used).

The mainstream definitions of the OECD-DAC criteria are neutral in terms of human rights and gender dimensions and these dimensions need to be added into the evaluation criteria chosen (see page 77, table 10 of Integrating Human Rights and Gender Equality in Evaluations).

Project evaluation questions

Relevance:

- To what extent was the project in line with the national development priorities (VISION 2030 and NTP 2020), the country programme's outputs and outcomes, the UNDP Strategic Plan and the SDGs?
- To what extent does the project contribute to the theory of change for the relevant country programme outcome?
- To what extent were lessons learned from the previous project considered in the project's design?
- To what extent were perspectives of those who could affect the outcomes, and those who could contribute information or other resources to the attainment of stated results, taken into account during the project design processes?
- To what extent does the project contribute to gender equality, the empowerment of women and the human rights-based approach?
- To what extent has the project been appropriately responsive to political, legal, economic, institutional, etc., changes in the country?

Effectiveness

- To what extent did the project contribute to the country programme outcomes and outputs, the SDGs, the UNDP Strategic Plan and national development priorities?
- To what extent were the project outputs achieved? (Please list concrete impact)
- What factors have contributed to achieving or not achieving intended outputs and outcomes?
- To what extent has the UNDP partnership strategy been appropriate and effective?
- What factors contributed to effectiveness or ineffectiveness?
- In which areas does the project have the greatest achievements? Why and what have been the supporting factors? How can the project build on or expand these achievements?
- In which areas does the project have the fewest achievements? What have been the constraining factors and why? How can or could they be overcome?
- What, if any, alternative strategies would have been more effective in achieving the project's objectives?
- Are the projects objectives and outputs clear, practical and feasible within its frame?
- To what extent have stakeholders been involved in project implementation?
- To what extent are project management and implementation participatory and is this participation contributing towards achievement of the project objectives?
- To what extent has the project been appropriately responsive to the needs of the national constituents and changing partner priorities?
- To what extent has the project contributed to gender equality, the empowerment of women and the realization of human rights?

Efficiency

- To what extent was the project management structure as outlined in the project document efficient in generating the expected results?

- To what extent have the UNDP project implementation strategy and execution been efficient and cost-effective?
- To what extent has there been an economical use of financial and human resources? Have resources (funds, human resources, time, expertise, etc.) been allocated strategically to achieve outcomes?
- To what extent have resources been used efficiently? Have activities supporting the strategy been cost-effective?
- To what extent have project funds and activities been delivered in a timely manner?
- To what extent do the M&E systems utilized by UNDP ensure effective and efficient project management?

Sustainability

- Are there any financial risks that may jeopardize the sustainability of project outputs?
- To what extent will financial and economic resources be available to sustain the benefits achieved by the project?
- Are there any social or political risks that may jeopardize sustainability of project outputs and the project's contributions to country programme outputs and outcomes?
- Do the legal frameworks, policies and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?
- To what extent did UNDP actions pose an environmental threat to the sustainability of project outputs?
- What is the risk that the level of stakeholders' ownership will be sufficient to allow for the project benefits to be sustained?
- To what extent do mechanisms, procedures and policies exist to allow primary stakeholders to carry forward the results attained on gender equality, empowerment of women, human rights and human development?
- To what extent do stakeholders support the project's long-term objectives?
- To what extent are lessons learned being documented by the project team on a continual basis and shared with appropriate parties who could learn from the project?
- To what extent do UNDP interventions have well-designed and well-planned exit strategies?
- What could be done to strengthen exit strategies and sustainability?

Evaluation cross-cutting issues questions

Human rights

- To what extent have poor, indigenous and physically challenged, women and other disadvantaged and marginalized groups benefited from the work of UNDP in the country?

Gender equality

- To what extent have gender equality and the empowerment of women been addressed in the design, implementation and monitoring of the project?
- Is the gender marker data assigned to this project representative of reality?
- To what extent has the project promoted positive changes in gender equality and the empowerment of women? Were there any unintended effects?

4. Methodology

Methodological approaches:

- Evaluation should employ a combination of both qualitative and quantitative evaluation methods and instruments.
- **Document review of all relevant documentation.** This would include a review of inter alia
    - Project document (contribution agreement).
    - Theory of change and results framework.
    - Programme and project quality assurance reports.
    - Annual workplans.
    - Activity designs.
    - Consolidated quarterly and annual reports.
    - Results-oriented monitoring report.
    - Highlights of project board meetings.
    - Technical/financial monitoring reports.
- **Semi-structured interviews** with key stakeholders
    - **Development of evaluation questions** around relevance, effectiveness, efficiency and sustainability and designed for different stakeholders to be interviewed.
    - Key informant and focus group discussions with men and women, beneficiaries and stakeholders.
    - All interviews should be undertaken in full confidence and anonymity. The final evaluation report should not assign specific comments to individuals.
- **Surveys and questionnaires** when relevant or meetings not possible
- **Field visits** and on-site validation of key tangible outputs and interventions.
- The evaluator is expected to follow a participatory and consultative approach that ensures close engagement with the evaluation managers, implementing partners and direct beneficiaries.
- **Other methods** such as outcome mapping, observational visits, group discussions, etc.
- **Data review and analysis** of monitoring and other data sources and methods.
    - Ensure maximum validity, reliability of data (quality) and promote use; the evaluation team will ensure triangulation of the various data sources.

The final methodological approach including interview schedule, field visits and data to be used in the evaluation should be clearly outlined in the inception report and be fully discussed and agreed between UNDP, stakeholders and the evaluators.

5. Evaluation products (deliverables)

- **Evaluation inception report (10 pages max).** The inception report should be carried out following and based on preliminary discussions with UNDP after the desk review, and should be produced before the evaluation starts (before any formal evaluation interviews, survey distribution or field visits) and prior to the country visit in the case of international evaluators.
- **Evaluation debriefings.** Immediately following the evaluation, UNDP expects a preliminary debriefing and findings.

- **Draft evaluation report (within an agreed length).**[12] The programme unit and key stakeholders in the evaluation will review the draft evaluation report and provide an amalgamated set of comments to the evaluator within two weeks of receiving draft, addressing the content required (as agreed in the TOR and inception report) and quality criteria as outlined in these guidelines.
- **Evaluation report audit trail.** Comments and changes by the evaluator in response to the draft report should be retained by the evaluator to show how they have addressed comments.
- **Final evaluation report.**
- **Presentations to stakeholders and/or the evaluation reference group** (if requested in the TOR).
- **Evaluation brief and other knowledge products** or participation in knowledge-sharing events, if relevant.
- **One-page evaluation summary to be presented to HE the Minister.** The one pager is to highlight key achievements of the project and their impact.

6. Evaluation team composition and required competencies

- **Required qualifications:** PHD degree in relevant discipline, minimum 10 years' experience in evaluations, preferable in the field of Water Resources Management, knowledge of Saudi, region or similar context, a plus.
- **Technical competencies:** Evaluation skills and experience, technical knowledge.
- **Language skills required:** Fluent English, knowledge of Arabic considered an asset

The applicant evaluator should be independent from any organizations that have been involved in designing, executing or advising any aspect of the intervention that is the subject of the evaluation

7. Evaluation ethics

Evaluations in UNDP will be conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation'.[13]

This evaluation will be conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation'. The consultant must safeguard the rights and confidentiality of information providers, interviewees and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The consultant must also ensure security of collected information before and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The information knowledge and data gathered in the evaluation process must also be solely used for the evaluation and not for other uses with the express authorization of UNDP and partners.

8. Implementation arrangements

[12] A length of 40 to 60 pages including executive summary is suggested.
[13] UNEG, 'Ethical Guidelines for Evaluation', June 2008. Available at http://www.uneval.org/search/index.jsp?q=ethical+guidelines.

The evaluator will meet with UNDP as well as the National Project Coordinator. She/he will work directly with the CTA and Project manager and meet with all project personnel as deemed necessary as well as stakeholders.

Reporting will be done via the M&E Focal point at UNDP

The evaluator is independent and will not be dictated recommendations by any party

9. Time frame for the evaluation process (over a period of two months)

- Desk review and Finalizing the evaluation design and methods and preparing the detailed inception report: five working days (within two weeks from signature of contract)
- Briefings of evaluator: 1 working day (first day on location)
- In-country data collection and analysis (visits to the field, interviews, questionnaires): 10 working days (within six week of contract signing)
- Presentation of preliminary findings: 1 working day (day 12)
- Preparing the draft report: home based, maximum two weeks after mission on location has ended
- Stakeholders' review of the draft report (for quality assurance): within two weeks of receiving report
- Incorporating comments and finalizing the evaluation report: three days after receiving comments

In addition, the evaluator may be expected to support UNDP efforts in knowledge-sharing and dissemination. Required formats for the inception reports, evaluation reports and other deliverables will be included in the annexes of the TORs

working day allocation and schedule for an evaluation

ACTIVITY	ESTIMATED # OF DAYS	DATE OF COMPLETION	PLACE	RESPONSIBLE PARTY
Phase One: Desk review and inception report				
Meeting briefing with UNDP (programme managers and project staff as needed)	-	At the time of contract signing	remote	Evaluation manager and commissioner
Sharing of the relevant documentation with the evaluation team	-	Within 2 days of contract signing	Via email	Evaluation manager
Desk review and Finalizing the evaluation design and methods and preparing the detailed inception report	5 days	Within two weeks of contract signing	Home-based	Evaluator
Comments and approval of inception report	-	Within one week of submission of the inception report	UNDP	Evaluation manager
Briefing meeting with UNDP and partners	1 day	First day on the job	UNDP/MEWA	UNDP/MEWA
Phase Two: Data-collection mission				
Consultations and field visits, in-depth interviews and focus groups	10 days	Within six weeks of contract signing	In country	UNDP to organize with local project partners, project staff, local authorities etc.
Debriefing to UNDP, MEWA and key stakeholders	1 day	End of mission (day 12)	In country	Evaluation team
Phase Three: Evaluation report writing				
Preparation of draft evaluation report (50 pages maximum excluding annexes), executive summary (5 pages)	5 days	Within two weeks of the completion of the field mission	Home-based	Evaluator
Draft report submission	-			Evaluator
Consolidated UNDP and stakeholder comments to the draft report	-	Within two weeks of submission of the draft evaluation report	UNDP	UNDP/MEWA
Debriefing with UNDP	1 day	Within one week of receipt of comments	Remotely UNDP	UNDP, MEWA and evaluator
Finalization of the evaluation report incorporating additions and comments provided by project staff and UNDP country office	3 days	Within one week of final debriefing	Home-based	Evaluation team
Submission of the final evaluation report to UNDP country office (50 pages maximum excluding executive summary and annexes)	-	Within one week of final debriefing	Home-based	Evaluation team
Estimated total days for the evaluation	**26**			

10. TOR annexes

Annexes can be used to provide additional detail about evaluation background and requirements to facilitate the work of evaluators. Some examples include:

- **Intervention results framework and theory of change.** Provides more detailed information on the intervention being evaluated.
- **Key stakeholders and partners.** A list of key stakeholders and other individuals who should be consulted, together with an indication of their affiliation and relevance for the evaluation and their contact information. This annex can also suggest sites to be visited.
- **Documents to be consulted.** A list of important documents and web pages that the evaluators should read at the outset of the evaluation and before finalizing the evaluation design and the inception report. This should be limited to the critical information that the evaluation team needs. Data sources and documents may include:
    - Vision 2030
    - National Transformation Plan
    - Project Document and Budget Revisions
    - Partnership arrangements (e.g., agreements of cooperation with Governments or partners).
    - Minutes of all meetings
    - National Water Strategy

- **Evaluation matrix** (suggested as a deliverable to be included in the inception report). The evaluation matrix is a tool that evaluators create as map and reference in planning and conducting an evaluation. It also serves as a useful tool for summarizing and visually presenting the evaluation design and methodology for discussions with stakeholders. It details evaluation questions that the evaluation will answer, data sources, data collection, analysis tools or methods appropriate for each data source, and the standard or measure by which each question will be evaluated.

Table 1. Sample evaluation matrix

Relevant evaluation criteria	Key questions	Specific sub questions	Data sources	Data-collection methods/tools	Indicators/ success standard	Methods for data analysis

- **Schedule of tasks, milestones and deliverables.** Based on the time frame specified in the TOR, the evaluators present the detailed schedule.
- **Required format for the evaluation report.** The final report must include, but not necessarily be limited to, the elements outlined in the quality criteria for evaluation reports (see annex 7).

- **Code of conduct.** UNDP programme units should request each member of the evaluation team to read carefully, understand and sign the 'Code of Conduct for Evaluators in the United Nations system', which may be made available as an attachment to the evaluation report.

Annex 2: List of interviewees interviewed during the evaluation mission

Name	Position	Date
Dr. Abdulaziz Shaibani	A/ Deputy Minister & A/National Project Coordinator	8 October, 2019 14 October, 2019
Martin Keller	Chief Technical Advisor (CTA)	Multiple meetings throughout the mission
Mayssam W. Tamim	Assistant Resident Representative UNDP	8 October, 2019
Asim Salah	Senior programme associate	8 October, 2019
Dr. Abdulaziz Alshuaibi	General Director of water regulations	9 October, 2019
Dr. Ayman Abdulrahman	Ground water expert	9 October, 2019
Dr. Mohammad Jumaah	Hydro-chemistry expert	9 October, 2019
Eng. Zakaria Mahmoud	GIS and remote sending expert	9 October, 2019
Eng. Nedal Khalifah	GIS and Hydrogeology expert	10 October, 2019
Dr. Omar Ouda	Water Management Expert	10 October, 2019
Dr. Abdulhamed Alzeraa	Project Manager, head of projects follow up office, and lead of output 4.	10 October, 2019
Mohammad Rasheeduddin	Technical advisor, National Center for Water Research and Studies	10 October, 2019
Prof. Dr. Abdulaziz M. Al Bassam	Director General of the National Center for Water Research and Studies	10 October, 2019
Dr. Mohammad Abdulaziz	Expert Water transmission lines	13 October, 2019
Dr.Abdulaziz Al-Qarawi	Expert water management and planning	13 October, 2019
Eng. Mazen Alwshi	Expert water planning	13 October, 2019
Dr. Yahya Alotibi	Manager of the WAEC	14 October, 2019
Prof. Dr. Mansour Al-Garni	Vice General Director of the NCWRS	14 October, 2019
Eng. Metib Alqahtani	Director General of Water Resources Department	14 October, 2019

Tajj Eldien	Expert IT programmer	14 October, 2019
Eng. Aref Alkalali	General Director of Center for Water Management and Control	14 October, 2019
Dr. Soud Bin Marshad	Director General of Water Planning	15 October, 2019
Eng. Hussien Elyami	Director General of the communication and support services	15 October, 2019
Eng. Soliman Al-Shalan	Expert Surface water resources	15 October, 2019
Dr. Mohammad Jamil	Surface Water Expert	16 October, 2019
Dr. Yosri Matar	Dams expert	16 October, 2019
Eng. Abdullah Khan	GIS Analyst	16 October, 2019
Debriefing meeting to UNDP senior management		16 October, 2019

Annex 3 Evaluation Consultant Code of Conduct Agreement Form

Evaluation Consultant Agreement Form[14]

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Mohammad Alatoom

Name of Consultancy Organization (where relevant)**:** N/A

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Riyadh* on *7. October. 2019.*

Signature: _____

[14]www.unevaluation.org/unegcodeofconduct