



## 1. Project Data

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|--|---|--|
| Project ID<br>P117170  | Project Name<br>5M-GEF Coordination&Capacity Bldg. NASA |  |
| Country<br>Middle East and North Africa                          | Practice Area(Lead)<br>Water                            |  |
| L/C/TF Number(s)<br>TF-10251,TF-10252,TF-10253,TF-10254,TF-10263 | Closing Date (Original)<br>31-May-2015                  | Total Project Cost (USD)<br>5,644,545.00 |
| Bank Approval Date<br>09-Jun-2011                                | Closing Date (Actual)<br>31-May-2015                    |  |
|  | IBRD/IDA (USD)  | Grants (USD)                             |
| Original Commitment  | 0.00  | 4,594,545.00                             |
| Revised Commitment   | 0.00  | 4,470,278.36                             |
| Actual   | 0.00  | 4,470,278.36                             |

Sector(s)  
Irrigation and drainage(79%):Public administration- Agriculture, fishing and forestry(21%)

Theme(s)  
Water resource management(50%):Rural services and infrastructure(46%):Regional integration(4%)

|  |                                  |  |                         |
|--|----------------------------------|--|-------------------------|
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|--|----------------------------------|--|-------------------------|

## 2. Project Objectives and Components

### a. Objectives

The project was financed by the Global Environment Facility (GEF) Trust Fund. The project development objective as stated in the GEF Grant Agreement (Schedule 1, page 6) and in the Project Appraisal Document (PAD) was:

**“To improve water resources and agricultural management and planning within and across the Beneficiary countries based on quantitative and spatial-based decision making tools.”**

The GEO of the project was to better manage local and regional water resources and reduce the threat of land degradation and climate change to vulnerable agricultural production systems and water resources in and across the project areas while developing options to address land-based pollution affecting the Mediterranean Sea.



Following IEG procedures, this ICR Review is based upon IEG's assessment of the achievement of the project objective as formulated in the GEF's Grant Agreement and it does not rate the achievement of GEF's Global Environment Objective.

This project with four countries – Jordan, Lebanon, Morocco and *Centre Regional De Teledetection Des Etats D'Afrique Du Nord* (CRETAN) for Tunisia – and the Arab Water Council (AWC) - was the first phase of a horizontal Adaptable Program Loan (APL-1). (The AWC is an established partner of the Arab League's Ministerial Council for Water and other regional institutions across countries in the Middle East and North Africa Region (hereafter referred to as MENA) and a regional non-profit organization. The second phase of the project (APL-II) was to trigger Egypt once it had fulfilled its effectiveness conditions.

- b. Were the project objectives/key associated outcome targets revised during implementation?

No

- c. Components

**Component 1. Improved Water Resources and Agricultural Management.** Appraisal estimate US\$2.45 million. Revised estimate US\$2.58 million. Actual cost US\$2.62 million. Sub-component activities included: (a) the purchase, installation and implementation of Water Information System Platform (hereafter referred to as WISP) tools and related ancillary equipment in the participating countries. (The WISP tools include remote sensing equipment, land surface models and land data assimilation systems that could be operated without relying on ground-based data and hence were not bound by geographical constraints and political boundaries). (b) Applying WISP tools to pertinent research issues in local and regional water resources (such as identifying drought and flood prone areas, estimating groundwater fluxes and evapotranspiration, monitoring climate change impacts and crop yield estimates).

**Component 2. Capacity Building and Project Management.** Appraisal estimate US\$1.75 million. Revised estimate US\$1.62 million. Actual cost US\$1.47 million. Sub-component activities included: (i) Capacity building for implementing WISP on local levels. (ii) Local workshops to share results with stakeholders. (iii) Participating in international conferences and study tours on environmental remote sensing. (iv) Funding graduate fellowships. (v) Developing a national online portal to share data across stakeholder institutions.(iv) Project management.

**Component 3. Regional Integration and Cooperation.** Appraisal estimate US\$0.39 million. Revised estimate US\$0.39 million: Actual cost US\$0.39 million. Sub-component activities included: (a) Organizing quarterly workshops with regional stakeholders. (b) Developing an online portal to share regional results, and (c) Generating yearly regional reports on applications of regional significance (such as estimating the recharge rates of regional oversubscribed shared aquifers, formulating response to droughts and floods at the regional level and encouraging a more coordinated approach to managing transboundary water resources).

- d. Comments on Project Cost, Financing, Borrower Contribution, and Dates

**Project Cost.** Appraisal estimate US\$4.59 million. Actual cost US\$4.48 million. The difference between the appraisal estimate and actual cost was due to exchange rate changes between the local currencies and the US\$.

**Project Financing:** The project was financed by a GEF Trust Fund. Appraisal estimate US\$4.59 million. Amount disbursed US\$4.48 million. The difference between the appraisal estimate and amount disbursed was due to changes in exchange rate changes.

There was co-financing from the United States Agency for International Development (USAID) for complementary activities such as making available the open-source Water Information System Platform (WISP) and technical assistance to the participating countries from the National Aeronautics and Space Administration (NASA).

**Borrower Contribution.** Although Borrower Contribution was not planned at appraisal, the participating countries contributed about US\$0.64 million at closure.

**Dates:** The second phase (APL II), which triggered on August 28, 2012, is still under implementation and expected to close by November 30, 2016.

The first phase was restructured on June 19, 2014, following the recommendations of the Mid Term Review on April 5, 2014. Although the project development objective remained unchanged, following the restructuring, the results framework was revised and monitoring indicators were scaled up for the three project development indicators, new intermediate indicators were added for measuring the specific outcomes for each sub-component and for monitoring the outcomes of the capacity building activities to the end-user agencies. There was also reallocation of funding between activities. The first phase of the project closed as per schedule on May 31, 2015.



### 3. Relevance of Objectives & Design

#### a. Relevance of Objectives

At appraisal, fourteen of the twenty MENA countries were classified as being in water deficit - defined as less than 500 cubic meters of renewable water supply per capita per year. Further, the Intergovernmental Panel on Climate Change reported an expected precipitation decrease over the next century by over 20 percent, a likely increase in the frequency and severity of droughts and a reduction in groundwater recharge rates in large parts of the region. The need for regional cooperation was reinforced, given that 60 percent of the region's water supply flowed across international borders.

At appraisal, the project development objectives were consistent with the national priorities and the Bank strategy for the regional countries. The priorities of the participating countries identified the need for improving the sustainability of water resources management. At appraisal, the development objective was consistent with the focus areas of the Country Assistance Strategies (CAS) of the participating countries. The program was part of the Bank's Arab World Initiative, which emphasized the need for cooperative regional solutions to major challenges such as water resource management, food security and climate change. The project development objective was also consistent with the Bank's "Water Resources Sector Strategy – Sustaining Water All in a Changing Climate.", particularly with respect to improving the client countries' access to technologies and dissemination of information for results-based decision making.

The project development objective was in line with the "MENA Regional Water Security Initiative", initiated recently by the Bank's Water Global Practice. While the first pillar of this initiative identified the need for enhancing technical capacity and sharing information, the second pillar supported the development of a regional geospatial water database.

The development objective was consistent with both the GEF's (i) Long-term objective of GEF's International Waters Focal Area to "foster international, multi-state cooperation on priority water concern." And (ii) the GEF's Strategic Program for International Waters "to balance overuse and conflicting uses of water resources in surface and groundwater basins that are transboundary in nature."

Rating

High

#### b. Relevance of Design

The statement of the project development objective is clear and the causal links between project activities, their outputs and their outcomes were logical. and the intended outcomes were measurable. The combination of component one activities (installation of Water Information System Platform tools and applying these tools to water sector issues at the national and regional levels and component two activities (capacity building activities through academic education, working with international experts on project problems and project training) and component three activities aimed at regional cooperation can be expected to contribute to improving the management of water resources and agricultural management and planning both within and across the participating countries. Given the scarcity of water resources in the MENA region, the project design appropriately focused on regional cooperation to realize the economies of scale associated with installing low-cost techniques for measuring the presence and usage of water in the participating countries.

Rating

Substantial

### 4. Achievement of Objectives (Efficacy)

#### Objective 1

Objective



To improve water resources and agricultural management and planning within and across beneficiary countries, based on quantitative and spatial-based decision tools.

#### Rationale

Despite a Level 2 restructuring that included changes to the key associated outcome targets (revised upward), IEG has chosen not to undertake a split evaluation as the changes would not make a material difference to the achievement of the project against the Project Development Objective.

#### Outputs

- 52 Water Information System Platform (WISP) tools were installed as compared to the original and revised targets of two and 50 respectively.
- 23 WISP tools were made operational at project closure. This exceeded the revised target of 19.
- 32 modeling outcomes were reported to end user agencies in the local and regional remote sensing institutions and the ministries of natural resources, environment, water resources, agriculture and disaster management, at project closure. This exceeded the revised target of nine.
- 14 technical and policy plans were developed by end users at closure as compared to the revised target of six.
- 439 stakeholder staff were trained on use of WISP tools as compared to the original and revised targets of 15 and 252 respectively.
- 24 scholarships for advanced study/work experience in environmental remote sensing and other appropriate fields were provided in each participating country as compared to the original and revised targets of four and 17 respectively.
- 35 stakeholder training workshops were held by project closure as compared to the original and revised targets of six and 31 respectively. 28 regional/international workshops and conferences were held by project closure. This exceeded the revised target of 20.
- Seven regional workshops were held by the Arab Water Council (AWC) as compared to the original and revised targets of five and six respectively.
- Seven regional reports on impact of climate change on regional water resources was published as compared to the target of four.

#### Outcomes

- Seven WISP tools were operational in total (including one in Lebanon and two each in Jordan, Morocco and Tunisia respectively), at project closure. This exceeded both the original and revised targets of two and four respectively. The WISP tools included both: (i) common application areas in all countries (such as identification of flood and drought prone areas and related forecasting and monitoring, crop and irrigation mapping, climate change impact estimates to aid in water and agriculture management decisions. And (ii) addressing special country priorities, such as Lebanon using the project as the basis for developing disaster management programs and focusing on using the project data for forest fire and flood forecasting, Morocco using the data for guiding locust survey teams and Tunisia using the data to forecast floods and work on estimation of groundwater fluxes.
- Ten major water resources decisions were made in total on improved agricultural and land use management across beneficiary countries, based on the recommendations of the technical assistance activities at project closure. This exceeded the original and revised targets of four and eight respectively. The decisions included:
  - Four water sector decisions in Morocco. (i) The real time monitoring data from the draught study was used by the Ministry of Agriculture and Marine Fisheries for conducting Morocco's compensation program for draught affected farmers. (2) Morocco's National Center for Combatting Locust launched a prevention plan in areas prone to locusts based on the conclusions of the locust study. (3). The Ministry of Water and Agriculture used the recommendations of the e climate change component study for implementing the national plan for climate adaptation. (4) The Ministry of Water and Agriculture used the water balance study for drawing a national water strategies plan.
  - Two decisions in Jordan. (1) An amendment to the groundwater law was enacted by Parliament following the recommendations of the Ministry of Water and Irrigation, based on the research results of the crop mapping component for selected pilot. (2) The Water Information System Platform installed through this project was used by the Ministry of Water and Irrigation for research studies on irrigation optimizations and water resource management..
  - Two decisions in Lebanon: (1) The Sustainable Management of Natural Resources and Early Warning Platform (SuNaR) developed for providing real time forecasting and monitoring information and maps showing hot spots for flood risk and forests fire prevention was launched in Septemeber 2014, by the Ministry of Agriculuture for the National Response Plan. (2) The Ministry of Water and Energy started the process of standardizing, harmonizing and sharing policy in climatic and hydrological data..
  - Two decisions in Tunisia: (1) The project outputs on climate change was used by the Ministry of Water and Agriculture in developing



mitigation actions to adapt olive production to future changes. (2) The results of the simulations models for flood forecasting was used for the Floodplain Management Plan in October 2015.

- Five regional and country project data portal to the end user agencies in the agriculture and water sectors to improve the existing development strategy, policy and planning was developed and operational at project closure, as per the revised target. This exceeded the original target of three.

Rating  
Substantial

## 5. Efficiency

There was no formal economic or financial analysis both at appraisal and at completion. The ICR discusses potential savings that could result from the project investments. For instance, while past locust outbreaks are estimated to have cost Moroccan agriculture from US\$50 – US\$100 million, the project financing for the locust control activity in Morocco was about US\$300,000. Similar comparisons of benefits relative to costs were discussed for flood forecasting in Tunisia and Lebanon, cessation of groundwater overdraft in Jordan, and improved forest fire mitigation in Lebanon. There are grounds to assume that the remote sensing technology supported under the project allowed better performance results in terms of efficiency compared with the use of traditional methods.

**Administrative and Operational issues.** There were initial implementation days in the first 18 months due to a combination of factors, including unclear responsibilities of the different project related agencies, lack of clear incentives and activities for end user to participate in project implementation, the limited knowledge and capacity on Bank’s implementation procedures and policies and lack of needed technical capacity for innovative activities. However, these were rectified over the course of project implementation through targeted training and international technical assistance where consultants worked side-by-side with local staff. Despite the slow start of implementation, all main components and activities were fully implemented and completed as per schedule and with full disbursement in the participating countries in the first phase of the program.

Efficiency Rating  
Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

|              | Rate Available? | Point value (%) | *Coverage/Scope (%)                          |
|--------------|-----------------|-----------------|--|
| Appraisal    |                 | 0               | 0<br><input type="checkbox"/> Not Applicable |
| ICR Estimate |                 | 0               | 0<br><input type="checkbox"/> Not Applicable |

\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome



The project development objective was highly relevant to the participating countries, in the regional context, to the Bank strategy for the region and to the GEF objectives. Relevance of Design was rated Substantial. Efficacy was rated Substantial: all intended outcomes were either realized or surpassed. Efficiency was assessed as Substantial, due to cost effectiveness and completion of all the activities by project closure.

- a. Outcome Rating  
Satisfactory

## 7. Rationale for Risk to Development Outcome Rating

**Technical Risk.** The risk associated with the weak technical capacity is rated as Modest. At completion, the participating countries had a good cadre of staff knowledgeable in remote sensing technologies and their applications in various aspects and new developments in the field due to a combination of factors including, training provided as part of this project and general rise in higher education standards in the countries involved and the return of people from higher study abroad.

- a. Risk to Development Outcome Rating  
Modest

## 8. Assessment of Bank Performance

- a. Quality-at-Entry

The project was prepared in collaboration with country stakeholders, international donors, implementation partners and in close collaboration with National Aeronautics and Space Administration (NASA) scientists and affiliated academic partners. NASA provided the Water Information System Platform and technical assistance to participant countries. Several risks were identified including risks associated with slow cooperation among the various stakeholders in sharing hydrological information. Risk mitigation measures were incorporated and the overall risk of the project was rated as Medium. Appropriate measures were included for ensuring compliance with financial management and procurement management issues (discussed in Section 11). The indicators chosen for monitoring were appropriate (discussed in section 10a).

The project had a complex project implementation design, covering several thematic areas in several disconnected countries in the Region and in coordination with other development partners (including the US Government, USAID and NASA). The project intended to introduce highly sophisticated, customized models and scientific tools for timely decision making. Most of the participating countries were at different levels of capacities for adopting such technologies based on their specific priorities. This caused unnecessary delays in the initial years of the project. These issues were rectified during implementation through both targeted training and international technical assistance with consultants working alongside local staff.

At preparation, there were no detailed implementation plans such as an operational manual with associated annual detailed investment, procurement and disbursement plans and annual physical and financial targets and a detailed training plan for each modeling study. This resulted in initial implementation delays.

Quality-at-Entry Rating  
Moderately Satisfactory

- b. Quality of supervision

Seven Implementation Status Reports (ISRs) were filed over a five year period. The supervision team was proactive and responsive to the national needs (Borrower's ICR, page 51) and worked closely with the NASA team, the Project Management Unit and end-users and this aided in tailoring the project activities to the priorities of the participating countries. Following the recommendations of the Mid Term Review, key indicators were appropriated revised and targets were revised upwards to reflect the final adjusted and agreed activities and additional indicators were included to monitor the outcomes of capacity building activities and training programs. This aided in instilling wider project ownership and cooperative work within the countries.



Quality of Supervision Rating  
Satisfactory

Overall Bank Performance Rating  
Moderately Satisfactory

## 9. Assessment of Borrower Performance

### a. Government Performance

The government's of the respective countries were highly committed to the project and the Ministry of Finance in all countries provided complete support during the design and the implementation phase. The Project Management Units in each participating country was sufficiently staffed and there was sufficient counterpart budget allocation. At Bank's suggestion, all the Project Management Units' signed Memorandum of Understanding (MOU) with relevant line ministries and end users for the application of the remote sensing studies and this aided in appropriate collaboration with the Bank and other development partners.

Government Performance Rating  
Satisfactory

### b. Implementing Agency Performance

There were five implementing agencies: The Conseil National de la Recherche Scientific for Lebanon, the Ministry of Water and Irrigation for Jordan, the Centre Royal de Teledetection Spatiale for Morocco, the National Authority for Remote Sensing and Space Sciences for Egypt, the Centre Regional De Teledetection Des Etats D'Afrique Du Nord for Tunisia and a regional coordination agency - the Arab Water Council (AWC). The AWC had national and regional links and was able to ensure efficient coordination and help in knowledge sharing and exchange at the regional level. The implementing agencies actively participated in the project through the execution phase. Workshops and conferences held under the supervision of AWC aided in project progress and its implementation. The initial project delays were due to the lack of knowldeg of the Bank's procurement and financial procedures.

Implementing Agency Performance Rating  
Satisfactory

Overall Borrower Performance Rating  
Satisfactory

## 10. M&E Design, Implementation, & Utilization

### a. M&E Design

The three key outcome indicators – implementation of WISP tools in the implementing agencies, number of major water resources decision made using WISP tools and development of regional project data portal – were appropriate. The implementing agencies were required to submit information on physical and financial progress to a regional coordination office of the AWC.

### b. M&E Implementation

Following the recommendation of the Mid Term Review, the indicators were revised upwards and additional indicators were added for monitoring capacity building activities. The input data from remote sensing and stakeholder's feedback during the local workshops helped in fine tuning the national indicators and tailoring the project activities to meet the end users demands.



c. M&E Utilization

The M&E results were utilized for identifying key implementation issues and recommending adequate remedial actions and monitoring implementation progress.

M&E Quality Rating  
Substantial

## 11. Other Issues

a. Safeguards

The project was classified as a Category C project and no safeguard policies were triggered. The ICR (page 7) notes that there was compliance with safeguards during implementation.

b. Fiduciary Compliance

**Financial Management and Procurement.** The Bank Financial and procurement specialists were located in the country offices of the respective countries and this aided in providing timely support to the Project Management Units in addressing financial management and procurement issues. The ICR (page 7) notes the audits were unqualified and procurement planning and procedures were in compliance with Bank policies.

c. Unintended impacts (Positive or Negative)

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d. Other

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## 12. Ratings

| Ratings | ICR                     | IEG          | Reason for Disagreements/Comment  |
|---------|-------------------------|--------------|---|
| Outcome | Moderately Satisfactory | Satisfactory | IEG agrees with the project outcome rating of Satisfactory as outlined in the actual ICR document. The 'Moderately Satisfactory' rating provided here electronically is a system generated error and should be corrected by OPCS. |



|                             |              |                         |  |
|-----------------------------|--------------|-------------------------|--|
| Risk to Development Outcome | Modest       | Modest                  | ---  |
| Bank Performance            | Satisfactory | Moderately Satisfactory | IEG agrees with the actual ICR's rating of Bank Performance as Moderately Satisfactory, due to moderate weaknesses in Quality at Entry. The 'Satisfactory' rating listed here in this section is a system generated error. |
| Borrower Performance        | Satisfactory | Satisfactory            | ---  |
| Quality of ICR              |              | Substantial             | ---  |

**Note**

When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.

The "Reason for Disagreement/Comments" column could cross-reference other sections of the ICR Review, as appropriate.

### 13. Lessons

The ICR draws the following main lessons from implementing this project.

- 1 A regional operation can help when there are common problems across several countries. In the case of this project, countries excelled in various aspects of the project and hence could learn from each other. This aided in assimilating new technologies. Workshops and training courses were also more efficient with the participation of four countries.
- 2 Detailed project implementation plans are necessary even for technical assistance projects. In the case of this project, lack of detailed implementation plans delayed implementation in the initial years of the project. The marked improvement in project performance highlighted the importance of applying Bank protocols during project preparation even for technical assistance projects, so that the project starts well and quickly.
- 3 A good coordinating body can be extremely useful, particularly for a regional project. In the case of this project, the regional coordinating agency – the Arab Water Council - played a crucial role in coordinating with all participating countries and this aided in the implementation of the project by the Project Coordination Units in each country.

### 14. Assessment Recommended?

No

### 15. Comments on Quality of ICR

The ICR is well written and provides a reasonably good description of the project. It is also clear on how issues were resolved following the recommendations of the Mid Term Review. Lessons are derived from the project experience. The ICR could have provided deeper insights and details into the important implementation issues for a project with a regional dimension that are complex by nature. On a minor note, the ICR could have provided a glossary of terms used at several places in the text.

- a. Quality of ICR Rating  
Substantial