



1. Project Data

Project ID

P130801

Project Name

Regional Coordination for Improved Water

Country

Egypt, Arab Republic of

Practice Area(Lead)

Water

L/C/TF Number(s)

TF-12960

Closing Date (Original)

30-Nov-2016

Total Project Cost (USD)

1,050,000.00

Bank Approval Date

17-Jul-2012

Closing Date (Actual)

30-Nov-2017

IBRD/IDA (USD)
Grants (USD)

Original Commitment

1,050,000.00

1,050,000.00

Revised Commitment

1,050,000.00

999,368.57

Actual

1,025,315.85

999,368.57

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2. Project Objectives and Components

a. Objectives

The project development objective (PDO) of the Second Phase of the Multi-country Regional Coordination on Improved Water Resources Management and Capacity Building Program (APL 2) Project in the Project Appraisal Document (paragraph 17) was "to improve water resources and agricultural management and planning in and across Egypt". This is consistent with the Grant Agreement (Schedule 1) which instead uses the Program Development Objective (APL1 and APL2) "to improve water resources and agricultural management and planning within and across the Beneficiary Countries". The achievement of the project's objective was to be "based on quantitative and spatial-based decision making tools". This PDO was the



same as the development objectives of the preceding APL1 in this series which pertained specifically to Lebanon, Jordan, Morocco, the Arab Water Council (AWC) and Regional Center for Remote Sensing of North Africa States (CRTEAN). APL 2 specifically focused on Egypt.

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

No

c. Will a split evaluation be undertaken?

No

d. Components

Component 1: Improved Local Water Resources and Agricultural Management (Estimated allocation for Egypt: US\$745,000, actual disbursement: US\$675,000)

The focus of this component was on improving local water resources and agricultural management. There were two subcomponents. The first was completion of technical studies such as (a) Water Balance Study - Land Information System (LIS) Modeling Study; (b) Ground Water Study; (c) ET Modeling Study; and (d) Crop Mapping and Irrigation Optimization Modeling Study. The second subcomponent was focused on installing and operationalizing Water Information System Platform (WISP) tools in relevant departments. Improved Local Water Resources and Agricultural Management

Component 2: Capacity Building and Project Management (Estimated allocation for Egypt: US\$305,000, actual disbursement: US\$365,000)

This component focused on capacity building and supported various advanced remote sensing technical trainings for national experts from the implementing agency and end user agencies on issues covering groundwater, crop and irrigation optimization, monitoring of evapotranspiration (ETWatch), and Land Information System (LIS) scientific studies.

Component 3: Regional Integration and Cooperation (Estimated allocation for Egypt: US\$0, actual disbursement: US\$10,000)

This component supported the following activities: (a) participation in regional and international workshops, (b) development of a national online portal containing local and national results generated from the use of WISP tools, and (c) regional dissemination of data generated through WISP tools.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Costs: The full cost of the project at appraisal was US\$1.05 million. The actual costs at the time of closing (excluding VAT, Customs, and Non-Resident Income Tax) were US\$1.05 million.

Financing: The project was financed through the Global Environmental Facility (GEF) Trust Fund Grant Number TF012960.



Borrower Contribution: The Government of Egypt as Recipient committed no funds to the project at appraisal or during implementation.

Dates: The project was approved on July 17, 2012, and became effective on August 28, 2012. The midterm review (MTR) was undertaken 13 May 2015. The project's original closing date was 30 November 2016 but actual closing date was 30 Nov 2017.

The project had a level 2 restructuring after the MTR. The two PDO indicators and several intermediate outcome indicators were modified to account for progress on actual investments made and expected results achieved on completion. These changes were adjustments to align the project with a specific country context and focus of the APL 2 on Egypt. In addition, the project was extended for one year following the initial implementation delays (2013-2015) resulting from the temporary change in U.S. Financial Aid Policy to Egypt that led to NASA stopping all TA activities provided to Egypt since October 2013.

3. Relevance of Objectives

Rationale

Water scarcity is the key constraint and limiting factor for sustainable economic development in Egypt. With increasing population growth and rapid urbanization, the pressure to shift water from agriculture (which consumes over 84 percent of the water resources) to domestic and industrial uses has increased across the Middle East and North Africa region, including Egypt. Lack of reliable, low-cost and timely water information systems was conceived as the key challenge in improving water resources management in Egypt and the Middle East region (PAD p.1). The ICR also highlights that the institutions in Egypt depend on manual data collection which is carried out at source and with long intervals and such data tends to be unreliable or incomplete due to the cost of collection and temporal and spatial variability. The lack of accurate and timely data on water resources, alternative uses and changes over time "significantly limits the capacity of decision makers and water managers to institute and operationalize sustainable water resources management" (ICR p. 5).

In order to address these challenges, this project aimed to transfer and operationalize various Water Information System Platform (WISP) tools for water resources management within the National Authority for Remote Sensing and Space Sciences (NARSS) in Egypt. A number of WISP tools which have been developed by commercial entities, academic centers and institutions are available for transfer to Egypt and could significantly enhance the frequency, relevance, consistency and application of water data collection. WISP tools, which include remote sensing equipment (such as satellite receiving stations, digital map analysis software and others), land surface models and land data assimilation systems, can operate without relying on ground based data and thus are not limited by human and technical resources, geographic constraints and political boundaries (PAD p. 2). The transfer and operationalization of the WISP tools in Egypt was expected to enable the following key outputs (ICR paragraph 12): (a) monitoring of changes in



water availability, including surface and groundwater storage, river runoff, and related land use changes retrospectively and in near real-time; (b) prediction of regional hydrological impacts of climate change scenarios; and (c) the creation of a forum for cooperation and data sharing among nations, including coordinated management of transboundary water resources, estimation of recharge rates of oversubscribed shared aquifers, and optimization of the response to droughts and floods, among other advantages. The project PDO is consistent with the Egypt CPF 2015–2019 goals under "Objective 2.4: Enhanced access to improved agriculture and irrigation services." The PDO is specifically relevant to the GOE request to support the Integrated Agricultural Development Program which highlights three specific components: " (i) institution building and capacity enhancement; (ii) sustainable water and land development; (iii) modern agribusiness and related infrastructure; and (iv) knowledge and innovation systems" (CPF p. 33-34). The PDO is also relevant to Egypt's national strategic priorities outlined in the Egypt Sustainable Development Strategy 2030 around two pillars: (1) Economic development priorities which include (i) Water resources development; (ii) Expanding sustainable development program for Nubian sand stone tank; and (iii) Developing groundwater and facing its infringement (p. 17); and (2) Environmental program priorities which include: (i) Strengthening the institutional and legislative structure of water resources management system; (ii) Expanding infrastructure for supporting a sustainable water system; (iii) Adopting fiscal policy reforms to encourage sustainable consumption patterns of water and natural resources; (iv) Raising the awareness to reserve environment and natural resources, providing incentives for more advanced alternatives and technologies for water conservation and natural resources protection (p.33). The PDO is also in line with both (i) the long-term objective of the GEF's International Waters Focal Area: "to foster international, multi-state cooperation on priority water concerns" and (ii) with 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" (PAD p. 3).

Rating
High

4. Achievement of Objectives (Efficacy)

Rationale

The development objective of the Second Phase of the Multi-Country Regional Coordination on Improved Water Resources Management and Capacity Building Program (APL 2) was to "improve water resources and agricultural management and planning in and across Egypt".

The theory of change for achieving this objective outlined in the ICR was that "the project aimed at addressing the challenge by exploring many WISP tools that have been developed by commercial entities, academic centers, and institutions and are able to significantly enhance the frequency, relevance, consistency, and application of water data collection" (paragraph 11). The ICR also asserts that "advanced science technologies and decisionmaking information system will lead to a fully integrated water supply and demand management system, especially to deal with the serious water scarcity issues in Egypt" (paragraph 14).



The outputs, intermediate outcomes and final outcomes, summarized below, were gleaned from Annex 1 and various other parts of the ICR. The output indicators were selected from the intermediate results indicators provided in Annex 1(A2).

Outputs

- **Water Information System Platform (WISP) Hardware Purchased and Installed in implementing agency.** A total of 36 WISP hardware was purchased and installed. This represented 240% of the target value of 15 units revised at restructuring (ICR p. 27). The purchased and installed equipment include High Performance Computing (HPC) Server to run the Land Information System (LIS) software; 72 computing cores; 256 GB memory and 24 TB hard disk; backup and storage system; 4 printers and 2 photocopiers; in-situ measurement devices such as Time Domain Reflectometry (TDR) Soil moisture measurement; Thermal Camera; Crop Analyzer; VLF meters; and ASD Spectroradiometer.
- **Number of remote sensing and stakeholder staff trained on use of WISP tools.** A total of 40 remote sensing and stakeholder staff were trained on use of WISP tools representing 320% of the target number (15) revised at restructuring. The ICR also indicates that overall 128 staff members and stakeholders attended various training programs on technical capacity building, procurement and financial management. These trainings were expected to contribute to strengthening the technical and institutional capacity of Project Management Unit (NARSS) and line ministries.
- **Local stakeholder training workshop.** A total of 7 training workshops were conducted representing 140% of the revised target number and 117% of the original target. No details were provided about the number of participants or the content of the training.
- **Number of international/regional conferences/workshops.** A total of 16 regional and international events were organized to share knowledge and experience with stakeholders. This represents more than a threefold increase from the original target and 106% of the revised target value.
- **Number of participants for the international/regional/local training/conferences/workshops.** A total of 119 people participated in the international/regional/local training/conferences/workshops representing 264% of the revised and original target value.
- **Total number of WISP tools adapted and models operational.** A total of four WISP tools were adapted and operationalized (100% of the revised target and twice (??) the original target) including one each for the Water Balance Study, Groundwater Study, Irrigation Optimization (Crop/irrigation mapping and monitoring study), and the evapotranspiration modeling study.

Intermediate Outcomes

(i) Number of WISP systems operating

- The originally intended Land Information System (LIS), which was considered as the core of the Water Information System Platform (WISP) as designed at appraisal, has been installed and is operational in the NARSS.



- The Evapotranspiration Remote Sensing System (ETWatch) was installed and is operational in the NARSS. The ICR indicates that the system has been able to measure the evapotranspiration (ET) from space and produce maps for excess water usage in agriculture activities. This system has produced the daily, monthly, and yearly ET maps. The data generated in the project area were successfully validated. To maximize the results, the NARSS has worked closely with the Ministry of Water Resources and Irrigation (MWRI) through an agreement with the Water Management Research Institute (WMRI), an MWRI affiliate. This has enabled the decision makers at the MWRI to develop technically informed policies and plans for water conservation and efficient water resource management (ICR, paragraph 36).
- Groundwater monitoring using data from the Gravity Recovery and Climate Experiment (GRACE) is the third WISP system which has been established in the NARSS. The ICR indicates that the system has been used to map the depletion and recharge areas and rates across the National Agricultural Statistics Service (NSAS). The NARSS Ground Water Team successfully processed the GRACE data obtained by using NASA's GRACE satellites. The ICR also indicates that the availability of this satellite-based system in Egypt is expected to benefit the whole region in monitoring the aquifer levels, as the region moves to relying on technological innovations for improved water resource management. In Egypt, the system will inform decisions for reclamation of 1.5 million feddan under the government's strategic development plan (paragraph 36).

(ii) Project portal in operation

The ICR indicates that one regional project data portal was developed and operationalized representing achievement of 100% of the original target. This portal was developed by constructing a documentary page that considered all training materials, reports and publications. The three key agencies, the NARSS, MWRI, and Ministry of Agriculture and Land Reclamation (MALR), agree that this geoportal will be important for several activities including seasonal Land Information System (LIS) forecasting, ETWatch maps, seasonal crop mapping, and monitoring yearly groundwater status (paragraph 39).

(iii) Modeling outcomes reported to end-users

A total of four modeling outcomes were reported to end-users representing 100% of the original and revised target value. The ICR indicates that "All modeling outcomes were comprehensively communicated to relevant stakeholders" (ICR p. 30).

(iv) Technical and policy implementation plans developed by end-users

A total of 2 technical and policy implementation plans were developed by end-users and 100% of the target value was achieved (ICR, Annex 1 (A.2)).

PDO Outcomes

The project's results chain defines three outcome indicators to measure the achievement of the PDO: (a) Number of WISP systems operating within the NARSS; and (b) Number of major water resources decisions made on improved agricultural and land use management taking into consideration outputs of WISP tools; and (c) Project portal in operation. The first and third indicators, however, are outputs and intermediate outcome indicators,



respectively, and have been included in the assessment of outputs and intermediate outcomes above. The second indicator: “improve water resources and agricultural management and planning within and across Egypt” which directly measures the achievement of the PDO has been used to assess the extent to which the project’s objective has been achieved.

Number of major water resources decisions made on improved agricultural and land use management taking into consideration outputs of WISP tools - The ICR (paragraph 38) indicates that the project helped inform two key water resource and agricultural and land use management decisions, which were important project outcomes namely;

- the decision on water management systems taken by the MWRI to scale up the ETWatch System to be used at the national level as the water accounting and allocation tool, and
- the decision by the MWRI to use the findings of the Ground Water (GW) study for the technical design and implementation of the mega national project of reclaiming 1.5 million feddan (about 0.63 million ha).

The first refers to the key policy decision by MWRI to scale up the ETWatch monitoring system to cover the whole country based on demonstrated efficacy and efficiency of the system in the project pilot area of Zankaloun. However, at the time of closing, the ETWatch System has not yet been rolled out for improving or optimizing actual water management decisions beyond the pilot area. In order to support the scaling up process, the ICR indicates that “the MWRI has established a Water Accounting Unit to further improve the application of the system. The MWRI has entered into an agreement with the China World Bank Group Partnership Facility (CGWPF) to enhance the capacity of this unit for scaling up this system at the national level. A formal letter was issued by the Minister of the MWRI to confirm this decision.” (ICR p. 14).

The second refers to the decision by MWRI to use the findings of both groundwater monitoring using Gravity Recovery and Climate Experiment (GRACE) and the mapping of groundwater discharge areas as the primary data and information source for future planning of their land reclamation projects in collaboration with National Authority for Remote Sensing and Space Sciences (NARSS). For this purpose, MWRI fully participated in all training programs and related research activities. The groundwater modeling was customized to accommodate priorities for land reclamation in the Nile Basin with a national goal of reclaiming 1.89 million hectares by 2030. The availability of reliable scientific data on groundwater resources using the GRACE tool in the Nubian Sandstone Aquifer is expected to facilitate the achievement of this goal.

Summary. While the original PDO indicator target value was four “major water resources decisions made on improved agricultural and land use management taking into consideration outputs of WISP tools” (ICR, Annex 1), the formally revised target value after the MTR was reduced to informing just one such decision. Since the project informed two key decisions (outlined above), it can be considered to have achieved its revised PDO target value (ICR, paragraph 38).

Overall Efficacy Rating

Substantial

No information available



5. Efficiency

No project efficiency analysis was undertaken at project appraisal stage. Similar to other technical assistance projects where the full benefits are non-quantifiable ex-ante, it was not possible to apply standard quantifiable rate of return or cost-benefit analysis criteria to determine its expected economic efficiency. Without providing any detailed analysis, the ICR however argues that the benefits from the project "dwarf the very small cost of the project". The following examples were provided in paragraph 42 to demonstrate its efficiency:

- Shared data resources to reduce costs from non-coordinated and duplicate data collection. The project reduces the cost of data collection by multiple agencies through the establishment of the project portal, which will serve as repository "for all water- and irrigation-related data generated through new technologies and will be accessible to end users at the MWRI and MALR".
- Reduced data collection costs. The MWRI spends about 85% of its irrigation budget annually on irrigation and about 10 percent of this amount (LE 121.89 million or about US\$ 8.13 million). This is spent on carrying out terrestrial investigations using SUV caravans across the desert to monitor the few groundwater observation wells, to assess dryness of vegetation, and to assess drought impacts or water usage. The remote sensing tools operationalized through the project are expected to significantly reduce these costs as well as improve accuracy. The ICR estimates that integrated data collection using remote sensing tools would save approximately LE 25 million (about US\$1.67 million) annually.
- Reduced costs for future land reclamation efforts. The findings of the groundwater study are expected to be used for the planning of future reclamation projects that will be prepared under the National Reclamation Program (NRP), which is considered a national priority by the Government of Egypt. The estimated cost of the NRP is about LE 6 billion (about US\$400 million). The program aims to increase agricultural area by an estimated 35 percent through horizontal expansion (goal of the national Agricultural Policy), which in turn is expected to result in major economic benefits for communities in the Nile Basin. The program is also expected to expand the habitable desert area by 20 percent, hence reducing population pressure in the Nile Basin. In summary, considering the small cost of the project at US\$1.05 million, there is a strong case for concluding that there will be significant financial and economic returns in future suggesting substantial efficiency gains from the project's investments. However, the project's operational efficiency was negatively affected by an unexpected administrative delay during implementation, leading to a one-year extension which was necessary to achieve a number of the key outcome targets. The delay was caused by the political unrest in Egypt and the unforeseen change in the U.S. Financial Aid Policy to Egypt, forcing the NASA team to stop all technical assistance activities provided to Egypt from October 2013 up until late 2015.

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 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

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

6. Outcome

The project is rated High for Relevance of Objectives, and Substantial for Efficacy and Efficiency. These results indicate that the project had minor shortcomings and its outcome is therefore rated Satisfactory.

a. Outcome Rating

Satisfactory

7. Risk to Development Outcome

The information provided in the ICR indicates that despite its small size, this technical assistance project has helped Egypt in building capacity, establishing a strong cadre of expertise in Remote Sensing technologies. This was facilitated through collaboration with international experts on practical problems and associated specific technical training needs. This has helped operationalize various WISP tools and validate output data on water availability, agricultural trends, and climate change impacts. The Bank supported this effort with an interest to assist the Government of Egypt in identifying scale-up opportunities for improved management of water resources at national scale.

However, as the ICR notes the national level rollout of WISP tools for enhanced decision making will require a significantly higher level of competence and financial resources than what was made available through this small technical assistance project. This means that the NARSS currently lacks the required capacity and resources for a national level rollout of the WISP system. The NARSS will require substantial financial resources and large-scale capacity enhancement to accomplish this. This was identified as the major risk to sustainability of development outcomes of the project at completion (paragraph 82).

Part of the risk to the development impact originates from the nature of the project which was designed as a small stand-alone GEF grant as a sequel to the APL1. While the technical assistance has produced important results, and has been valued by the client country, the sustainability issue raises questions whether the World Bank should be involved in execution of these small grants without linking them with other major investments. This is important both for rolling out the new technologies and decision support systems to the national level



and to reduce the high administrative and supervision costs (per unit of variable costs). Therefore, as the ICR notes, the challenges of supervision and sustainability of achievements need to be considered in case of the use of small stand-alone grants in a large country without accompanying investment project. The introduction and scaling up of knowledge-intensive technologies should also be addressed through long term strategic programs and partnerships rather than small scale technical assistance projects (ICR p.25).

In an effort to enhance the scaling up challenge, the ICR notes that the NARSS has planned to establish a center of excellence for operationalizing the services based on earth observation. The center of excellence is expected to provide the end users and stakeholders (e.g. MWRI and MALR) with updated information extracted from the remote sensed data. The ETWatch System will be the key to providing monthly and seasonal information on evapotranspiration at the national level while the LIS will also be operationalized and is intended to be used as a seasonal weather forecasting engine. The partnership established with the CAS through the CWPF, is expected to enhance the capacity of the NARSS to sustain the use of technologies introduced by the project. Considering these risks and the limited risk mitigation measures considered in the PAD, the overall risk to the sustainability of the project's outcomes is rated as Substantial.

8. Assessment of Bank Performance

a. Quality-at-Entry

The project was conceived as a follow up to APL 1 which was implemented as a regional activity through the Arab Water Council. The ICR notes that the World Bank appraisal team incorporated some lessons from APL1 in the design of this project and the project's main components were well aligned with APL1 but focused on Egypt. The key strength of the design was the integration of the state-of-the-art technologies and decision support systems for improved management of scarce water resources in Egypt into the project concept and design. This was enabled through the collaboration with international partners including NASA. By mobilizing international and regional expertise required to operationalize various WISP tools and validate output data, the World Bank aimed to assist the Government of Egypt in identifying scale-up opportunities for improved management of water resources.

However, the design had at least two deficiencies. The first was the failure to link the small technical assistance grant with another major investment program to support effective rolling out of the technologies and the WISP system to a national scale. This was critical for enhancing the capacity of the implementing agency (NARSS) both in terms of the required level of specialized expertise and financial resource to support the utilization of the modeling results for decision making by the key ministries (MWRI and MALR). The second shortcoming was the results framework and M&E system for the project. The indicators chosen for monitoring the PDO and intermediate outcomes were inadequate and did not distinguish the outputs from intermediate outcomes and the PDO outcomes. Given the short-term nature of this small grant project, the long-term impacts in terms of changes in water resources, land rehabilitation and livelihoods were not included in the M&E design. Notwithstanding these modest shortcomings, the design is rated Satisfactory.



Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

The ICR notes that the World Bank provided regular supervision and implementation support on fiduciary issues during project implementation. The World Bank's supervision missions ensured that effective mechanisms for quality control and compliance with World Bank requirements were in place (paragraph 80). It provided advice to counterparts on satisfactory compliance with World Bank policies on procurement and financial management. Supervision was carried out by the Bank on an almost regular basis and financial and physical progress reports were requested from the implementing agency (paragraph 68). The aide memoires after supervision missions described the issues encountered and proposed recommendations to address issues which were discussed and agreed with the implementing agencies. Urgent issues were promptly brought to management attention. Project supervision ratings in the Implementation Status and Results Reports (ISRs) were reported by the ICR as candid and ratings of progress toward the PDO remained unsatisfactory for all of 2015. However, the progress toward achievement of the PDO targets reached a Satisfactory rating level at closing in November 2017 (paragraph 79).

The major challenge for the project was the slow initial start and the delay caused by unforeseen external factors. The change in U.S. Development Aid Policy to Egypt led NASA, the key technical partner, stopped all technical assistance activities provided to Egypt for about two years (October 2013 to late 2015). This has halted activities and severely affected implementation as transfer of key software was suspended. This prompted the NARSS to work on finding alternative options to implement project activities and acquire the needed software.

Nevertheless, the Bank team remained proactive during this time, supervision missions continued and recorded the unsatisfactory progress of the project, and the Bank started to reach out to other development partners (paragraph 78). This facilitated the partnership between the NARSS and the Chinese Academy of Sciences. When implementation progressed again from 2016 following the resumption of the strained collaboration with NASA and the transfer of the open-source Water Information System Platform to Egypt, the task team provided timely and effective advice to the counterparts to accelerate implementations. The World Bank also requested a Mid-Term Review, which helped identify the challenges and proposed adjustments required for the project to progressively move towards meeting its objectives (paragraph 78).

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The project was conceived to operationalize an innovative water management approach and management system through applied advanced science and technologies with the idea that real time and accurate



decisionmaking information systems using remote sensing will lead to a fully integrated water supply and demand management system to address the water scarcity issues in Egypt. The project started with relatively clear objectives but the theory of change was not well structured to show how project activities of each component would contribute to achieving the PDO. While a comprehensive M&E framework was set up to keep track of implementation progress of all project activities, there was lack of clarity between outputs, intermediate outcomes and PDO outcomes in the project's design. In the Theory of Change presented in Figure 1 in the ICR, the three PDO outcome indicators for "improved water resources and agricultural management and planning" are at different levels of the results chain with only one of them (number of major water resource decisions made) likely to capture the anticipated outcome. The other two could not capture the PDO outcome and could only be considered part of the intermediate results contributing to the adaptation, validation and development of the decision support tools and systems before their use in water resource management decisions. Similarly, some of the indicators selected for capturing the intermediate outcomes could only be regarded as the initial outputs of the project (e.g. procurement and installation of a specific software or system). The issues in the results framework (RF) seem to have partly been inherited from the past as the project (APL 2) retained the RF for APL 1. This also meant that the PDO indicators were not specified for Egypt, an issue which was resolved at the MTR.

b. M&E Implementation

The project had a relatively simple M&E Implementation framework which did not involve extensive field surveys or impact evaluations. The ICR does not provide sufficient information on how the M&E framework was implemented, including how information on the identified indicators was monitored and captured regularly and to what extent any weaknesses in M&E design, including specification of indicators, were corrected during implementation. However, the ICR indicates that the PDO indicators which were inherited from the Results Framework of APL 1 lacked specific indicators for Egypt and this was only corrected following the MTR (paragraph 68). The ICR also indicates that input data from remote sensing and stakeholder's feedback during the local workshops helped refine and improve the national indicators and tailor the project's activities to meet end user needs (paragraph 69).

c. M&E Utilization

The ICR provides some information indicating that utilization of the M&E results contributed to identifying key implementation issues, recommending adequate remedial actions, and enhancing the physical and the financial implementation progress (paragraph 70). It also indicates that the M&E implementation framework clearly showed that working closely with end users allowed the PMU to know better their needs, assess their weakness and strengths, and identify the gaps and ways for improving capacity building (paragraph 69).

M&E Quality Rating

Modest



10. Other Issues

a. Safeguards

The technical assistance project was categorized as Environmental Category C, and no safeguard policy was triggered as it was not expected to have any environmental impacts. The project did not involve any physical works and was not expected to have any adverse environmental impacts and did not involve any land acquisition or resettlement. The Bank team monitored safeguards compliance during regular supervision missions. When fully rolled out to improve water resource and agricultural management and planning decisions, the project interventions will contribute to better use of water resources and enhance the capacity to adapt to climate change. Over the long term, this can be expected to have positive environmental impacts in Egypt and in the region. Land reclamation and expansion in settlement areas could also improve access to productive land assets for some households but potential negative social impacts for some vulnerable groups (e.g. leading to displacement or loss of resource rights) need to be monitored. Without providing any data, the ICR indicates that the project has started showing some positive social benefits to resource users who depend on reliable water data for irrigation management, drought and flood risk management, among others. Until the interventions are widely rolled out and used for improving water resource and agricultural decisions in Egypt, such benefits from the current technical assistance project will remain limited.

b. Fiduciary Compliance

The ICR indicates that the Financial Management (FM) systems including the Bank Operational Procedures and Policies on auditing arrangements, Procurement and Disbursement were adequately followed and complied with and were satisfactory to the World Bank. The Bank financial management specialists based in the Egypt country office provided timely and efficient support to the PMU on auditing, procurement and disbursement. Supervision of FM arrangements was carried out semi-annually as part of the project supervision missions. All audits were fulfilled according to the World Bank rules and procedures and had unqualified opinions. The ICR also notes that procurement reports were updated and submitted to the Bank after each supervision mission. Procurement supervision was carried out on a timely basis as required by the client. The ICR also indicates that in addition to following the established disbursement policies, almost all the grant funds were fully disbursed by the project closing date (except the unused balance of 5 percent of the total GEF grant largely due to exchange rate fluctuations in Egypt). At project completion, disbursements reached 95 percent of the total grant amount due to the depreciation of the local currency.

c. Unintended impacts (Positive or Negative)

China-World Bank Partnership Facility (CPWF). The ICR notes that given the performance of the two phases of the GEF-World Bank Regional Coordination on Improved Water Resources Management and Capacity Building Program, a follow-up training program (CPWF) was launched in 2017. The new CPWF



brings together the Arab Water Council (AWC), the PMUs/line ministries in the same five NENA/MENA countries along with the Chinese Academy of Science (CAS) to continue the transfer and adaptation of cutting-edge technologies for water management. Through the CWPF project, the NARSS will continue to work closely with the MWRI on ETWatch System's optimal operationalization and related capacity building and support Regional Coordination on Improved Agriculture Water Management by Applying ET Monitoring and Management System. The NARSS has also developed a partnership with the CAS, facilitated by the World Bank, which provided a two-month long hands-on training program in China on ETWatch System for scientists and researchers from the NARSS, MWRI, and MALR. This contributed significantly to institutional development of the NARSS (ICR paragraph 54).

Emergence of NARSS as regional leader. The ICR notes that NARSS has become the premiere capacity building institution on Remote Sensing (RS) in Egypt and across the region. The NARSS will be working closely with the AWC under the CWPF project by providing technical assistance to the council in implementing regional capacity-building activities related to the ETWatch System, which is a major component of the AWC's technical role in that project (ICR paragraph 49).

Center of excellence for climate change. The ICR reports that in order to maximize the use of the LIS and ETWatch System, the NARSS has agreed to host a center of excellence for climate change in collaboration with the Ministry of Environment Affairs. A core funding of US\$1 million has been allocated by the NARSS to host the new center of excellence on climate change.

d. Other

Government performance and commitment. Given the importance of the project to the overall government agenda of improving water resources management (a critical and scarce resource), the commitment and leadership of the Government of Egypt remained high from the beginning and continued throughout project implementation. The ICR notes that this commitment and leadership were evident through the attention the project received at all levels of the government. This contributed to the overall success of the small technical assistance project in transferring technology and building capacity, despite some delays and factors that affected its implementation.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	---
Bank Performance	Satisfactory	Satisfactory	---
Quality of M&E	Substantial	Modest	---
Quality of ICR		Substantial	---

12. Lessons



The ICR listed six lessons. In brief they were: (i) Linking research to practice is key for development effectiveness; (ii) Successful demonstration of innovative technologies ensures sustainability and helps create demand; (iii) Simplicity of design optimizes the impact; (iv) Relevance of the project is imperative to ensure strong political support and government ownership; (v) Technological innovations cannot be sustained without local expertise; and (vi) Viability of small scale grants and standalone projects.

IEG's summary of the main lessons, based in large part on the ICR, were as follows.

Technical and scientific cooperation with advanced institutions can help developing countries build domestic capacity and access modern technologies. This project has enabled the transfer, validation and operationalization of various WISP tools for improved water management and decision making within the NARSS in Egypt. This was made possible through extensive capacity-building program in collaboration with NASA, John Hopkins University, Wisconsin University, and the Institute of Remote Sensing and Digital Earth and Chinese Academy of Sciences (RADI/CAS). NARSS in turn worked directly with the relevant line ministries (including the MWRI, MALR, and Ministry of Environment, among others) to ensure that the data and methodology developed is transferred to these entities for improved water resources and agricultural management. The lesson was that leveraging its convening power, the Bank was able to support the mobilization of international and regional expertise to transfer and operationalize various WISP tools, validate new technologies, and then customize and adapt them for use in Egypt.

International cooperation for technology transfer works better when the technology is sourced from different countries and can be accessed from alternative suppliers. The performance of this project was severely threatened because of a temporary change in U.S. Financial Aid Policy to Egypt that led to NASA stopping all technical assistance activities provided to Egypt for about two years. This resulted in serious delays in all activities related to and depending on the transfer of the Land Information System (LIS) from NASA. This prompted the NARSS to work on finding alternative options to implement project activities and acquire the needed software. The situation only improved in late 2015 when NASA provided the LIS software to the NARSS after agreement with USAID/NASA and NARSS was finally reached in December 2015 following the change in US aid policy. The NARSS was however able to install and operationalize the ETWatch System (independently of LIS) to measure the ET from space and produce maps for excess water usage in agriculture activities. The experience in this project showed that this was made possible through the partnership with the Chinese Academy of Sciences, facilitated by the World Bank, which provided hands-on training programs in China on the ETWatch System for scientists and researchers from the NARSS, MWRI, and MALR.

Anticipated benefits from technology transfer are imperative to ensure strong political support and government ownership. Given the relevance of the project to the government's strategic needs, leaders at all levels of government focused on the project's progress and implementation management, and set up effective interdepartmental, multilevel cooperation mechanisms. This commitment and ownership were important for completing activities despite the two-year delay that affected the progress of the project. This experience confirmed again the need for the World Bank, together with its clients, to take necessary measures at the design stage to clarify the relevance of projects to meet the higher-level government priorities and strategic needs.

Small scale and standalone technical assistance projects cannot ensure sustainability and scaling up of technology transfer. Despite the effectiveness of this small standalone GEF grant for facilitating the transfer of technology and support for capacity building in Egypt, the rollout of the WISP tools at the national level requires substantial financial resources and large-scale capacity enhancement. The lesson is that a small project activity cannot facilitate the scaling up of innovative technologies unless it is linked with follow-up programs or ongoing large-scale investment projects.



13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR presents valuable information but was shallow or inadequate in presenting essential details (e.g. data presented on efficacy and efficiency was incomplete and/or inadequately articulated and discussed). Some of the data on performance indicators presented briefly in Annex 1 was not discussed in the narrative sections to clearly demonstrate and present evidence on the performance of the project. Despite some effort, Annex 1 does not provide an adequate and clear summary of the projects outputs and outcomes under the different components. On the other hand, the narrative in the ICR presentation generally followed a persuasive positive tone rather than a pragmatic evaluative tone to make the self-assessment plausible and credible. The sections on M&E design, implementation and its use were weak and inadequate. The sections provide relevant information on the deficiencies in the design, nor to demonstrate how the results framework was implemented and used to influence project management decisions. The impacts of the project on poverty presented under Other Outcomes and Impacts was speculative. Overall, the quality of the ICR was marginally substantial.

a. Quality of ICR Rating

Substantial