

Country Name	Project for Drainage Water Quality Control for Irrigation in Middle Delta
The Arab Republic of Egypt	

I. Project Outline

Background	The main issue of the water resources sector in Egypt was how to effectively utilize the limited water resources. Especially, shortage of irrigation water in the Nile Delta area, located downstream of the Nile River, was very severe, and securing irrigation water was one of the national urgent issues in Egypt. Under such circumstances, it was expected that reuse of drainage water by resolving contamination due to untreated drainage water from industrial factories and households, animal feces and urine, dumping of waste materials, could serve as one of the effective strategies.		
Objectives of the Project	Through verification of the pilot projects, this project aimed to formulate a Master Plan (M/P) of reusing drainage water including the measures for water quality conservation in mid-term (3-5 years) and long-term (around 10 years) in Kafr El Sheikh Governorate, thereby contributing to increase in the available irrigation water in the Central Nile Delta.		
	1. Expected Goals through the proposed plan ¹ : Beneficial area of drainage water reuse for irrigation is increased in Kafr El Sheikh Governorate.		
Activities of the Project	1. Project Site: Central Nile Delta Pilot project Site: Kafr El Sheikh Governorate		
	2. Main Activities: <Phase 1> Draft the master plan for drainage water reuse; Design components of the pilot projects. <Phase 2> Implement the proposed pilot projects based on the draft master plan; Finalize the draft master plan based on the lessons learned through the pilot projects.		
Activities of the Project	3. Inputs (to carry out above activities)		
	Japanese Side	Egyptian Side	
	1) Mission members: 8 persons	1) Staff allocated from Ministry of Water Resources and Irrigation (MWRI)	
	2) Trainees received: 20 persons	2) Land and facilities: Office space	
	3) Equipment for field studies	3) Supply or replacement of machinery, equipment, etc. for project implementation	
	4) Implementation cost of pilot projects		
Project Period	February 2012 - March 2016	Project Cost	(ex-ante) 430 million yen
	(Extended period: January 2015 - March 2016)		(actual) 536 million yen
Implementing Agency	<u>Central level:</u>		
	• The Egyptian Public Authority for Drainage Projects (EPADP) under the Ministry of Water Resources and Irrigation (MWRI)		
Implementing Agency	<u>Regional level:</u>		
	• Kafr El Sheikh Governorate		
Cooperation Agency in Japan	Sanyu Consultants Inc.		

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of Egypt at the Time of Ex-Ante Evaluation and Project Completion></p> <p>At the time of ex-ante evaluation, the project was consistent with the development plan, the “National Water Resources Plan (NWRP) (2007-2017)”. It suggested “intermediate drainage water reuse”, i.e. shifting the reuse of drainage water from larger drains to smaller and less polluted drains in the upper part of streams. At the time of project completion, the NWRP (2007-2017) was still effective.</p> <p><Consistency with the Development Needs of Egypt at the Time of Ex-Ante Evaluation and Project Completion></p> <p>This project was consistent with Egypt’s development needs for sustainable water resources at the time of ex-ante evaluation as described in “Background” above. No information or report indicated the change of such needs up to the time of project completion.</p> <p><Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation></p> <p>According to the “Country Assistance Program for the Arab Republic of Egypt (2008)”, Japanese government committed to the support to three priority areas, including “Poverty Reduction and Improvement of the Living Standard”, which emphasized improvement of public services and social welfare as well as development of agricultural and rural communities on which this project was focused. The Program specifically added that “as Egyptian agriculture depends upon irrigation, it is vital to promote the effective use of water resources in consideration of overall water demand, and to diffuse agricultural technology for effective utilization of the limited cultivated lands”.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>
2 Effectiveness/Impact
<p><Status of Achievement for the Objectives at the time of Project Completion></p> <p>Through verification of the pilot projects, the project achieved its purpose to prepare the M/P of drainage water reuse for irrigation including water quality conservation at the time of project completion. Through preparing the master plan and implementing the pilot</p>

¹The degree of achievement of expected goals is not to be assessed in principle at the time of ex-post evaluation, since it is defined as the medium-to-long-term goals which will be attained as a result of crystallizing the proposed plan (“output” of the project).

projects, the capacity of concerned government organizations such as EPADP/MWRI and Kafr El Sheikh Governorate was strengthened. It was confirmed through the interviews with officials of EPADP/MWRI that the M/P satisfied the needs of the implementing agencies.

<Utilization Status of the Proposed Plan at the time of Ex-post Evaluation>

According to EPADP/MWRI officials, the measures for drainage water reuse for irrigation described in M/P were considered and were reflected on the inter-ministerial water resource policy, namely the “National Water Resource Plan (NWRP) (2017-2037)” (Indicator 1). NWRP Phase 3 (2017-2037) is under discussion in the parliament and not authorized yet, however MWRI and some donors who support MWRI have already started to implement some of important activities under the NWRP (2017-2037). This momentum affects implementation of the M/P. Firstly, based on the M/P, the Irrigation Sector (IS) under MWRI, realized the installation of 93 drainage water reuse pumps in Delta region under the “Project of Drainage Water Reuse”. Secondly, EPADP/MWRI implemented the feasibility study on “the Integrated Depollution of Kitchner Drain²(2016-2017)” with European Union (EU). Based on result of the study, the "Project for the Depollution of Kitchner Drain (2018-2021)” in euro 435-million worth, funded by three donors namely, EU, European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD) has been started. The study also examined the content of M/P and have led the rearrangement of the activity No.2 and No. 3 under the M/P to be included in the above project. Thirdly, EPADP/MWRI has started “National Drainage Program, Phase 3 (2015-2020) (NDP3)” in collaboration with three donors, namely, EU, Kreditanstalt für Wiederaufbau (KfW) and African Development Bank (AFDB). This program is in euro 170- million worth. Since one of the main activities of NDP3 is the establishment of drainage system in middle delta region, there is strong compatibility between the program and the M/P.

<Other Impacts at the time of Ex-post Evaluation>

Some activities related to the project have been identified through the survey of ex-post evaluation even without official approval of the M/P. Based on the idea of the M/P, the MWRI Sharquiya Governorate implemented the projects for drainage water reuse and has planned to transfer the water resources from Delta to Matrouh and North Sinai Governorate for irrigation purposes. As one of activities to promote the effective use of drainage water for crop production, the involvement of women in environmental awareness creation such that the female school teachers served as mediators for environmental campaigns for women and children, had let the people to recognize the importance of conserving water and environment, and thus, the people have started to consider the dumping garbage in the canals as a negative behavior that would harm the environment.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is fair.

Status of Achievement of Utilization Status of the Proposed Plan and Expected Goals through the Proposed Plan

Aim	Indicators	Results										
(Utilization Status of the Proposed Plan) Master Plan for drainage water reuse for irrigation will be utilized by Egypt as the water resource policy, and the short-term or mid-term measures proposed by the Master Plan are implemented by Egypt or donors.	(Indicator 1) The program of actions on drainage water reuse for irrigation in the Master Plan is adopted as one of effective measures for the integrated water resource planning in Egypt.	(Ex-post Evaluation) partially achieved According to EPADP/MWRI officials, the issue of drainage water reuse was adopted to the main pillars of the NWRP (2017-2037) and some components of the M/P were incorporated into the NWRP (2017-2037) which is yet to be approved by the parliament because of the huge gap between the estimated cost for its implementation and the amount possibly be covered by the government budget. With no budget allocated so far, the coordination and cooperation among different ministries have been limited. However, MWRI has started some activities under the NWRP (2017-2037) within the scope of the budget of the ministry.										
	(Indicator 2) The program of actions for the short-term or mid-term measures in the Master Plan is implemented by Egypt or donors.	(Ex-post Evaluation) partially achieved A steering committee to materialize the M/P was once established by the related organizations has not been functioning due to no allocation of funds by the Government of Egypt. It was identified during the ex-post evaluation study that EPADP/MWRI had implemented some components of the M/P by utilizing their own budget or donor fund.										
		<table border="1"> <thead> <tr> <th>Main activities planned under the M/P</th> <th>Activities carried out by EPADP, which are related to each component of the M/P (at the time of ex-post evaluation 2019)</th> </tr> </thead> <tbody> <tr> <td>1.Irrigation Complex Establishment</td> <td>Construction of Irrigation Complexes in Menah village and Belshasha village, instream treatment and solid waste management inside of Tellin Drain. In addition, the installation of 93 reuse pumps in the middle delta region have already been realized by Irrigation Department and Irrigation Sector under MWRI. These pumps support the idea of Irrigation Complex.</td> </tr> <tr> <td>2.Improving Drainage Water Quality for Irrigation in Garbia Drain</td> <td>Study on the Integrated Depollution of Kitchner Drain by EU (2016-2017) Based on the above study, EU, EIB and EBRD has jointly launched the Project for the Depollution of Kitchner Drain (2018-2021)</td> </tr> <tr> <td>3.Large-scale Reuse Pump Installation</td> <td>Together with the above activity No. 2, this activity will be covered under the “Project for the Depollution of Kitchner Drain (2018-2021)” as well.</td> </tr> <tr> <td>4.Renewal of Drain by Box Culvert</td> <td>In Kafr El Sheikh, 330 meters of drains has been covered, and 620 meters of drains are under bidding by EPADP.</td> </tr> </tbody> </table>	Main activities planned under the M/P	Activities carried out by EPADP, which are related to each component of the M/P (at the time of ex-post evaluation 2019)	1.Irrigation Complex Establishment	Construction of Irrigation Complexes in Menah village and Belshasha village, instream treatment and solid waste management inside of Tellin Drain. In addition, the installation of 93 reuse pumps in the middle delta region have already been realized by Irrigation Department and Irrigation Sector under MWRI. These pumps support the idea of Irrigation Complex.	2.Improving Drainage Water Quality for Irrigation in Garbia Drain	Study on the Integrated Depollution of Kitchner Drain by EU (2016-2017) Based on the above study, EU, EIB and EBRD has jointly launched the Project for the Depollution of Kitchner Drain (2018-2021)	3.Large-scale Reuse Pump Installation	Together with the above activity No. 2, this activity will be covered under the “Project for the Depollution of Kitchner Drain (2018-2021)” as well.	4.Renewal of Drain by Box Culvert	In Kafr El Sheikh, 330 meters of drains has been covered, and 620 meters of drains are under bidding by EPADP.
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² “Kitchner Drain” is the former name of “Garbia Drain” with same coverage area.

5.Strengthening Effective Use of Water Quality Monitoring System	No major activities have been done other than general monitoring.
6.Promoting Effective Use of Drainage Water for Crop Production	On-going, such as, promoting the reduction of using chemical fertilizers for the farmers who practice drainage water reuse.

Source : Final Report, Questionnaire and Interview with the implementing agencies

3 Efficiency

Both the project cost and the project period exceeded the plan (ratio against plan: 125% and 139%, respectively). The project was suspended for several months because of Japanese experts' evacuation from Egypt due to the security reasons. The suspension partially affected the progress of other activities, such as progress monitoring. The Outputs of the project were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

NWRP (2017-2037) clearly states the importance of water treatment. The third and the fourth pillars of the NWRP (2017-2037) related to "Improving Water Quality" and "Enhancing Management of Water Use" respectively, state the objectives and the measures for drainage water treatment. In addition, its first pillar, "Improving the enabling environment for MWRI in Planning and Implementation", describes the method and procedure for revising the regulation for drainage water reuse under the item of "Revision and update of Regulatory framework". This is to cope with the drainage water reuse in different treatment levels.

NWRP (2017-2037) is waiting for an approval by the Parliament, and the budget allocation from the government is not yet realized. However, responsible Ministries have already started some part of activities under NWRP (2017-2037) by securing the funds from donors to whom they have appealed the necessity to carry out the specific activities. Coordination among ministries and public institutions of water sector has partially been progressed with the donor's funds. It is expected that the coordination would be enhanced further with the official approval of NWRP (2017-2037).

<Institutional Aspect>

The organizational structure to implement the M/P was once established by involving the Ministry of Agriculture and Land Reclamation, the Egyptian Environmental Affairs Agency, the Ministry of Housing Utilities and Urban Development and the Ministry of Investment and International Cooperation³, but it is inactive at the time of ex-post evaluation as NWRP (2017-2037) is not yet authorized with budget. On the other hand, MWRI has tried their best to maintain the coordination among the relevant ministries with their own funds or within the scope of other donor-funded irrigation projects. In the NWRP (2017-237), drainage water reuse is recognized as to contribute to not only increasing the efficiency in irrigation but also mitigating the water shortage. The M/P has been shared among departments under the ministry, and has been utilized even by the department not involved in the project. One example is the installation of 93 drainage water reuse pump in Delta region.

<Technical Aspect>

According to the interview with officials of EPADP/MWRI, they have maintained the sufficient technical level. Training materials developed by the project have been used after the project completion, and the staff who participated in the project have shared their knowledge to others through on-the-job training (OJT). One of ex-counterparts issued scientific paper based on the knowledge cultivated through the Project.

<Financial Aspect>

Although the NWRP (2017-2037) is not officially passed by the Egyptian Parliament at the time of the ex-post evaluation, MWRI has taken steps to realize some of the components of the M/P by securing the fund separately for each component. One example is the "Project for the Depollution of Kitchener Drain". This was formulated on the bases of the government-funded "Project of Drainage Water Reuse" and "Study on the Integrated Depollution of Kitchener Drain" funded by EU, EIB and EBRD.

MWRI/EPADP is also implementing the "National Drainage Program, Phase 3 (NDP3)", signed in Nov. 2015 by three donors, namely, EU, KFW and AFDB, with a total budget of euro 170-million. One of the main components of the NDP3 is the establishment of drainage system in middle delta region, which would contribute to the achievement of the activity No.1 and No.4 of the M/P.

<Evaluation Result>

In light of the above, the M/P has not been approved yet, however continuous efforts to secure the sustainability on institutional, technical and financial aspects were observed. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The Master Plan of reusing drainage water including the measures for water quality conservation in mid-term and long-term in Kafr El Sheikh Governorate was developed under the project as the proposed plan, and it has been identified part of the M/P has been utilized by the time of ex-post evaluation. As for sustainability, some problems have been observed in terms of institutional, technical and financial aspects. As for efficiency, both the project cost and the project period exceeded the plan.

Considering all of the above points, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

- It is recommended that MWRI continue securing an adequate budget from the state and donors, to implement the M/P developed under the project in order to cope with the upcoming problem of irrigation water scarcity. In this relation, it is also strongly suggested that MWRI raise citizens' awareness on the importance of water reuse.

Lessons Learned for JICA:

- It was observed that not only national budget but also donor funds are utilized well for realization of the M/P. Continuous cooperation

³The Ministry of International Cooperation was merged with the Ministry of Investment in September 2017 and renamed as the Ministry of Investment and International Cooperation.

with donors will facilitate inter-ministerial coordination. Since the Project team did not disclose the idea of the draft M/P during the project period, it took long time until other donors recognized the existence of the M/P after the project completion. In order to propose the affordable and sustainable M/P for the government, it is expected that the project should consider the way to utilize the donor funds in parallel with national budget. The M/P could have been more effective if the intentions of other donors were confirmed to make the M/P more acceptable to them.