

Country Name	The Project for Rehabilitation of Floating Pump Stations in Upper Egypt (Phase IV)
Arab Republic of Egypt	

**I. Project Outline**

Project Cost	E/N Grant Limit: 740 million yen	Contract Amount: 673 million yen
E/N Date	(Phase I) December 2006, (Phase II) July 2007	
Completion Date	March 2009	
Implementing Agency	Mechanical and Electrical Department (MED), Ministry of Water Resources and Irrigation (MWRI)	
Related Studies	Basic Design Study: February - August 2006	
Contracted Agencies	Consultant	Sanyu Consultants Inc.
	Contractor	-
	Suppliers	(Phase I) Sojitz Corporation, (Phase II) Kubota Corporation
Related Projects	Project for Rehabilitation of Floating Pump Stations in Upper Egypt Phase I (1991-93), Phase II (1996-98), and Phase III (2003-04) (Grant Aid, Government of Japan)	
Background	<p>The agricultural sector of Egypt played the major role in the national economy by creating employment opportunities and acquiring foreign currency as well as securing food supply to the county. The sector accounts for 16% of the total GDP in 2003, which placed the third following the service sector (50%) and the industrial sector (34%). There were 103 irrigation pump stations along the River Nile in Upper Egypt, and out of them 45 stations are designed as floating type pump stations, which could no longer function properly due to deterioration. In response to the above situation, the Japan's Grant Aid Project, Project for Rehabilitation of Floating Pump Stations in Upper Egypt (Phase I, II, III) from 1991 to 2004 rehabilitated 26 floating pump stations.</p>	
Project Objectives	<p><b>Outcome</b></p> <p>To promote the stable water supply to farmers in Upper Egypt by supplying pump equipment for improvement of eight (8) pump stations.</p>	
	<p><b>Outputs(s)</b></p> <p>Japanese Side:</p> <p>a) Rehabilitation of 8 pump station at following locations:</p> <ul style="list-style-type: none"> <li>- No. 27: Gezeret El-Kobania Kebly (floating)</li> <li>- No. 29: Sahel El-Akab Bahary (floating)</li> <li>- No. 30: Gezeret Meneha (floating)</li> <li>- No. 31: El-Sarag (floating)</li> <li>- No. 32: Gezeret El-Fawaza El-Kebliya (floating)</li> <li>- No. 33: Middle Fawaza (fixed)</li> <li>- No. 34: Gezeret Abo Arafa (floating)</li> <li>- No. 35: El-Hegs El-Mostagda (floating)</li> </ul> <p>Egypt Side:</p> <p>a) New construction and rehabilitation of water tower, discharge pipe and discharge canal</p> <p>b) Replacement of transformer and electric cable</p> <p>c) Dismantlement of current pump station</p> <p>d) Installation of floating pump</p>	

**II. Result of the Evaluation**

Summary of the Evaluation
<p>Between 1991 and 2004, 26 floating pump stations along the River Nile in Upper Egypt were rehabilitated by the Japan's Grant Aid Projects. However, there still remained 19 floating pump stations that needed rehabilitation. Particularly eight (8) floating pump stations, which were targets of this project, seriously declined their functions and caused shortage of irrigation water in their service area.</p> <p>The project has largely achieved its objectives of the improvement of total water discharge (increase by around 40% since 2006), pump efficiency (from 30-40% in 2006 to 77% in 2012), crop production in the service area of the project (increase by 25% since 2006), and reduction of operation and maintenance (O&amp;M) cost (as a result of reduced operating time of pump stations). Also the project has positive impacts on increase in number of livestock and income of farmers.</p> <p>As for sustainability, there was no problem observed in terms of structural, technical and financial aspects and current status of O&amp;M of the implementing agency. For relevance, the project has been highly relevant with Egypt's development policy, development needs, as well as Japan's ODA policy at the time of both ex-ante and ex-post evaluation. For efficiency, the project period slightly exceeded the plan.</p> <p>In the light of above, this project is evaluated to be highly satisfactory.</p>

**1 Relevance**

This project has been highly relevant with Egypt's development policy ("to raise food self-sufficiency and to improve water
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resources” in the long-term socio-economic development plan titled “Egypt 21st Century 1997/98-2017/18”), development needs (“to maintain the irrigated agriculture in Upper Egypt”), as well as Japan’s ODA policy “the Japan’s Country Assistance Program for Egypt” with priority area of poverty alleviation and improvement of living standards at the time of both ex-ante and ex-post evaluations. Therefore, relevance of this project is high.

## 2 Effectiveness/Impact

The project has largely achieved its objectives of the improvement of total water discharge, pump efficiency, crop production in the service area of the project, and reduction of operation and maintenance (O&M) cost per unit volume of supply water. The total water discharge volume of target 8 pump stations improved by at least 41% in 2009 and 40% in 2012 since 2006 (before the project). the average pump efficiency<sup>(Note 2)</sup> of 8 pump stations improved from 30-40% in 2006 to 80% in 2009 and 77% in 2012, which achieved its target. The reason for slightly lower pump efficiency in 2012 than that in 2009 was due to minor adjustments of the suction and discharge water level of the pump stations. The crop production in the service area of the project increase from 19,500 t/year in 2006 to 24,765 t/year in 2009 (27% growth) and 24,375 t/year in 2012 (25% growth), which also met the target. The production volume has been increased in most of the crop area<sup>(Note 3)</sup>. This is because the productivity of crop production in the target area has improved by provision of sufficient volume of water with appropriate scheduled timing after the project. In addition, the irrigation service area has been expanded by average of 25% after the project due to increase of irrigation water supply, which also contributed to increase of crop production. According to the results of interview survey to 50 farmers in 5 villages in the target area, it was confirmed that improvement of electro-mechanical efficiency of pumping machine reduced O&M cost per unit volume of supply water by pump stations and outage hours of operations.

The project has positive impacts on increase in number of livestock of farmers. According to the interview survey results to farmers, most of farmers increased the number of their livestock because they were able to increase the production of livestock feed such as clover and berseem. Also farmers’ income was increased by a certain extent after the project due to increase of crop productivity. No negative environmental impact was observed and no land acquisition as well as no resettlement of people was conducted.

Therefore, effectiveness/impact of this project is high.

### Quantitative Effects

Indicator	baseline value (2006)	target value (2009 or later)	actual value (2009)	actual value (2012)
<b>Indicator 1</b> <sup>(Note 1)</sup> Total water discharge of 8 pump stations (PS)	28,600,000 m <sup>3</sup> /year	App. 35,500,000 m <sup>3</sup> /year (Increase by 24%)	40,407,000 m <sup>3</sup> /year (Increase by 41%)	40,174,000 m <sup>3</sup> /year (Increase by 40%)
<b>Indicator 2</b> <sup>(Note 2)</sup> Pump efficiency of 8 PS	30-40 %	80%	80%	77%
<b>Indicator 3</b> <sup>(Note 3)</sup> Crop production in the service area <sup>(Note 4)</sup> of the project	19,500 t/year	App. 24,765 t/year (Increase by 27%)	App. 24,765 t/year (Increase by 27%)	App. 24,375 t/year (Increase by 25%)

Source: Mechanical and Electrical Department (MED), Ministry of Water Resources and Irrigation (MWRI)

(Note 1) The part of the discharge volume at Station No.33 in 2012 was not available.

(Note 2) Pump efficiency = Water power outputs (kW) / Electrical power input (kW) x 100.

(Note 3) The major types of crops produced in Upper Egypt as follows: (i) in the winter season (from October to April): wheat, clover, berseem, onion and vegetables; (ii) in the summer season (from May to September): sugarcane, maize, bananas, soybean and sesame, and (iii) in the Nile season (from June to August, the term once the Nile river flooded before Aswan High Dam): vegetable, fruits and berseem. It usually depends on water availability whether farmers cultivate the summer season crops or the Nile season crops.

(Note 4) Actual values of indicator 3 in 2009 and 2012 are calculated based on the improved percentage estimated by the implementing agency (MED/MWRI).

(Note 5) Total service area of the project is 2,255 feddan (=947 ha) (1 feddan = 0.4 ha) which is supplied with water from the eight pump stations.

### Impact: Change in Average Number of Livestock (unit: No. of head/household)

Type of animals	Before the Project	After the Project
Cattle	2	3
Donkey	2	4
Sheep	10	12
Chicken	28	32

Source: The result of interview survey to 50 farmers in 5 villages in the target area.

## 3 Efficiency

Although the project cost was within the plan (91%), the project period slightly exceeded the plan (112%) due to the delay of equipment transportation (Bad weather hampered shipment to pass through sluice gate). Outputs were produced mostly as planned. Therefore, efficiency of this project is fair.

## 4 Sustainability

The target 8 pump stations are maintained by the Mechanical and Electrical Department (MED), Ministry of Water Resources and Irrigation (MWRI). Currently MED holds 10 supervisors, 30 mechanics/electricians, and 25 operators /guardians, who carried out the O&M of pump stations in the filed level including the target 8 pump stations. MED has a good experience in O&M of floating pumping stations, and they conduct the required schedule maintenance activities based on the O&M manual including preventive maintenance such as supplying lubrication oil and checking status of certain parts.

MED also provides training for the staff working for the floating pump stations, which covers basic O&M techniques of pumping stations including electro-mechanical equipment. Examining the maintenance budgets for MED in the past three years, it is supposed that MED has not experienced difficulties in allocation of O&M budget for the project facilities. All of the targeted 8 pump stations have been fully functioning without defects since their installation, and this could suggest that maintenance has been appropriately done so far.

This project has no problem in structural, technical and financial aspects of the implementing agency. Therefore, sustainability of this project is high.

### III. Lessons Learned

#### Lessons learned for JICA

In this ex-post evaluation, it took a long time to obtain data such as water discharge volume of each pump station and maintenance costs because the data are not arranged in the readily available manner. It is suggested that JICA requests an implementing agency to build a database during/after the project implementation phase, so that it has easy access to necessary data for checking facilities' conditions.



Floating Pump Station



Discharge Pipe