



**New Partnership for  
Africa's Development (NEPAD)  
Comprehensive Africa Agriculture  
Development Programme (CAADP)**



**Food and Agriculture Organization  
of the United Nations  
Investment Centre Division**

## **GOVERNMENT OF THE ARAB REPUBLIC OF EGYPT**

### **SUPPORT TO NEPAD–CAADP IMPLEMENTATION**

**TCP/EGY/2905 (I)  
(NEPAD Ref. 05/29 E)**

**Volume III of V**

### **BANKABLE INVESTMENT PROJECT PROFILE**

**Saad Armant Irrigation Improvement Project for 4,300 Feddans**

*December 2005*



**EGYPT: Support to NEPAD–CAADP Implementation**

**Volume I: National Medium–Term Investment Programme (NMTIP)**

*Bankable Investment Project Profiles (BIPPs)*

**Volume II: Enhancing Export Competitiveness of Egyptian Horticultural Crops**

**Volume III: Saad Armant Irrigation Improvement Project for 4,300 feddans**

**Volume IV: Improving Range–Livestock Productivity in the North–Western Desert of Egypt**

**Volume V: Integrated Water Management for Community Settlement in Farafra Oasis**



## NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

**Country:** Egypt

**Sector of Activities:** Irrigation

**Proposed Project Name:** **Saad Armant Irrigation Improvement Project for 4,300 Feddans**

**Project Area:** Total command area is 4,300 feddans in Saad Armant El Gabal area at Ihnasia district, in Beni Suef governorate

**Duration of Project:** 2 years

**Estimated Cost:** Foreign Exchange ..... US\$3.42 million  
Local Cost..... US\$1.47 million  
**Total ..... US\$4.89 million**

**Suggested Financing:**

<i>Source</i>	<i>US\$ million</i>	<i>% of total</i>
<i>Government</i>	1.47	30
<i>Financing institution(s)</i>	3.42	70
<i>Beneficiaries</i>	–	–
<i>Private sector</i>	–	–
<b><i>Total</i></b>	<b><i>4.89</i></b>	<b><i>100</i></b>

Note: US\$1 = LE5.84



**ARAB REPUBLIC OF EGYPT:**  
**NEPAD–CAADP Bankable Investment Project Profile**  
*“Saad Armant Irrigation Improvement Project for 4,300 Feddans”*

---

**Table of Contents**

<b>I.</b>	<b>PROJECT BACKGROUND.....</b>	<b>1</b>
<b>A.</b>	<b>Project Origin .....</b>	<b>1</b>
<b>B.</b>	<b>General Information.....</b>	<b>2</b>
<b>II.</b>	<b>PROJECT AREA.....</b>	<b>3</b>
<b>III.</b>	<b>PROJECT RATIONALE.....</b>	<b>4</b>
<b>IV.</b>	<b>PROJECT OBJECTIVES.....</b>	<b>5</b>
<b>V.</b>	<b>PROJECT DESCRIPTION .....</b>	<b>5</b>
<b>VI.</b>	<b>ESTIMATED PROJECT COSTS.....</b>	<b>6</b>





## I. PROJECT BACKGROUND

### A. Project Origin

I.1. Since, the beginning of the XXI<sup>st</sup> century, the government of Egypt represented by the *Ministry of Water Resources and Irrigation* (MWRI) has been doing its best developing its national water strategies and policies to face the expected water crisis due to the limited water resources, whereas the water demand would increase because of the rapid increase of population, the agricultural development, and the industrial growth.

I.2. The MWRI prepared its plan to encounter its water resources problems as follows:

- ***Optimal use of available water resources*** through:
  - Minimization of water losses;
  - Irrigation improvement projects;
  - Cost recovery;
  - Cropping pattern reform;
  - Groundwater development strategies;
  - Reuse of agricultural drainage water;
  - Reuse of sewage water.
- ***Water resources development*** through:
  - Increasing the Egypt’s share of the Nile water (Upper Nile projects such as Jonglei Canal);
  - Desalination of brackish groundwater;
  - Harvesting rainfall and flash flood water.
- ***Water quality management*** through:
  - Separating domestic and industrial sewage from agricultural drainage;
  - Treatment of domestic sewage;
  - Enforcement of water quality law to industrial facilities;
  - Reducing fertilizer and pesticide usage in cultivation;
  - Monitoring surface water and groundwater quality.

I.3. Implementing *Irrigation Improvement Projects* (IIP) in Egypt has been given a great priority as one of the procedures that would help to achieve the best efficient use of water in the field of cultivation and the maximum agricultural productivity per feddan and at the same time would overcome the water distribution problems among farmers

I.4. Comprehensive studies were made followed by the implementation of the IIP projects in some pilot areas using a grant offered by the USAID. The results were very optimistic showing technical and economic soundness of the project which encouraged Egypt to sustain the IIP projects. The World Bank and the German Bank for Investment offered Egypt a loan for carrying out the IIP

projects in an area of 250,000 feddans in El Behira and Kafr Elsheikh governorates, but there is still an area of about 6 million feddans that need to be improved.

I.5. The MWRI aims at rapid implementation of the rehabilitation and improvement of the existing water distribution systems covering the left 6 million feddans in old lands, and has a schedule for 1 million feddans within the next Five Year Plan. This will need 30 years, if a progress will be so, to improve all irrigation systems in old lands. The MWRI desires to increase the speed of execution for such rehabilitation and improvement projects receiving the engineering and financial cooperation to be extended from international agencies and developed countries by bilateral basis. Improving the infrastructure of the irrigation network at Ihnasia district on the boundary between El Fayoum and Beni Suef governorates served by El Maasra and Miana Canal both on the left bank of Bahr Youssef with a total command area of 4,300 feddans is suggested to be the next IIP project where rehabilitation and improvement would be executed as soon as possible after receiving cooperation from the donor countries.

## **B. General Information**

I.6. Water is considered to be a commodity of great strategic importance, it plays an important role in the different fields of development. Egypt is one of the developing countries that face great challenges, due to its limited water resources represented mainly by its fixed share of the Nile River water which equals about 55 billion cubic meters (BCM) per year, out of which nearly 10 percent is lost in the sea. Due to the rapid increase of population, social changes, and the agricultural and industrial growth, it is expected that demand on water would increase. As the agricultural sector is the major user of water in Egypt with a share amounting to 85% of the total demand of water, and in view of the expected increase in water demand from the other sectors such as municipal and industrial sector, the development of Egypt's economy strongly depends upon its ability to conserve, manage its water resources, find ways to improve performance and produce more crop per each drop of water.

I.7. Egypt covers an extremely arid region of North Africa. Egypt's main water resources are the River Nile and a very limited amount of non-renewable groundwater in the Eastern and Western deserts and in Sinai Peninsula. Rainfall in Egypt is very rare except in a narrow strip on the northern coast where a significant rain-fed agriculture is experienced. The per capita share of water currently stands at less than 1,000 (about 900) m<sup>3</sup>/capita/year, a figure that according to the international standards is equal to the water poverty limit for a country, which may drop to 600 m<sup>3</sup>/capita/year in 2025.

I.8. The availability of water in the very good conditions of Egypt governs the demographic distribution of population. People lived since the dawn of civilization on the banks of the river and within the reach water can go. The situation continued over thousands of centuries till very recently and as a result the majority of population (more than 70 million) is concentrated in less than 4% of the area of the country. The total agricultural area is around 8 million feddans.

I.9. Egypt has a major food security problem because agricultural production is less than the food requirements of the population especially in oil crops and grains (wheat, maize, etc.). Efficient use of all water resources in Egypt requires the formulation and implementation of appropriate water policies. The MWRI is formulating the national water policy for the XXI<sup>st</sup> century to face the challenge of water scarcity. The policy's overall objective is to utilize the available conventional and non-conventional water resources to meet the socio-economic and environmental needs of the country.

I.10. The formulated policy focuses on the following major aspects:

- Demand management;
- Resources development;
- Environmental conservation.

I.11. The MWRI and the *Ministry of Agriculture and Land Reclamation* (MALR) have been planning and working together to increase the agricultural production in Egypt in two directions:

- ***The Vertical Expansion*** to increase the productivity of lands by using seeds of high productivity, modern methods of cultivation and by improving the irrigation and drainage conditions in old cultivated lands. This would be achieved through the implementation of the Improvement Irrigation Projects, main drainage systems and the installation of subsurface drainage.
- ***The Horizontal Expansion*** to increase the area of the cultivated land by reclaiming the deserts beside the Nile Valley and the Delta, and in Sinai Peninsula. This will require great amounts of water to be saved from our limited water resources at an acceptable level of quality.

## II. PROJECT AREA

II.1. The project area is located between Bahr Youssef at the east and Gabal Sediment at the west with a total area of 4,300 feddans. This area is irrigated by two canals that are fed by Bahr Youssef. These canals are: El-Maasra canal at km 270 left bank of Bahr Youssef with a total length of 10.5 km and a total command area of 2,300 feddans, and Miana canal at km 270.75 left bank of Bahr Youssef with a length of 4.7 km serving an area of 2,000 feddans. The project area is considered to be lying on the boundary between El Fayoum and Beni Suef governorates.

II.2. The proposed project area is chosen because it is a drought-prone and a densely populated one. People there are suffering from water shortage especially at the tails of the meskas<sup>1</sup> due to unfair distribution of water. This affects their land agricultural productivity leading to low farmer income. Great areas are found to be damaged due to salt accumulation in the project area.

II.3. The climate in the project area is distinguished to be desert or Saharan climate, sunny all over the year, with very low humidity and almost no rainfall. The major economic activity is based on the agricultural sector. Some people depend upon fishing from Bahr Youssef to earn their livings, others work in mining or in trading.

II.4. Concerning the social activities, two types of cooperatives are found in the project area, one is established by governmental instruction (local society development association) and the other is set up by the farmers as a special cooperative (national association). The organization of the cooperative can be divided into three levels, national, governorate and district, in principle each village has one cooperative in which a farmer has to be a member as a duty.

II.5. Until now, no *Water User Associations* (WUAs) are found on the canals and meskas serving the project area. But, one of the main activities of the IIP is building up WUAs to improve water

---

<sup>1</sup> Egyptian tertiary irrigation canal.

delivery and on-farm water use and this activity would start immediately upon receiving financial cooperation from international agencies and developed countries.

II.6. With regard to the present agriculture in the area of the project, maize is considered to be the dominant crop in summer. Some kinds of vegetables are also cultivated in the summer season, whereas berseem and wheat predominate in winter cropping. Cotton represents an important export crop whose share in crop composition is relatively high

II.7. The irrigation rotation system at principal and main canals flow for 24 continuous hours. Branch canals, which branch off from the main canal (Bahr Youssef canal in the project area), have a continuous flow system that is applied in El Fayoum governorate where the gravity irrigation method is used, three turn rotation system (5 days on, 10 days off) is used. However, considering governorate-basis cropping area provided by MALR, quantity of distribution water from the Nile River to the principal canal is annually/ monthly and/ or 10-days basis estimated based on the unit water requirement provided by the Irrigation Department of MWRI. Reused drainage water, groundwater use, drinking use and industry use are also taken into consideration.

II.8. Since, there is almost no rainfall in the project area as mentioned before, drainage problem caused by rainfall is not found. The salt accumulation on top soil, which is brought by high groundwater tables known as water logging caused by irrigation water, however results, reducing production of the farm output and increasing uncultivable area. MWRI and MALR have implemented tile drainage projects and improvement of drainage canals projects in order to control groundwater table. The tile drainage network there pours in the two open drains (Mazoura and Sediment drains). The drainage water is one of the valuable water resources in Egypt. Farmers individually lift drainage water to their fields during water shortage period in summer. Since the farmers can not mix drainage water with fresh water, some damaged areas due to salt accumulation are found in the project area.

II.9. According to what is mentioned above, we can conclude the problems found in the project area in the following points:

- Frequent occurrence of water shortage at the tails of canals and meskas due to water conveyance losses especially in peak periods resulted from inequitable water distribution among farmers between the head and the tail of the branches;
- Low irrigation efficiency caused by the applied rotation system;
- High annual operation and maintenance costs of meskas;
- Bad condition of the existing irrigation structures;
- Bad condition of meskas due to growth of weeds;
- Bad condition of soil due to water logging.

### III. PROJECT RATIONALE

III.1. Agricultural sector is the most important sector in Egypt supplying foods and employment opportunity and contributing to earning foreign currency by export. However, small agricultural holdings, occupying about 6 million feddans are the major constraint for the Egyptian agriculture. Agriculture in Egypt depends upon irrigation by the limited water resources of Lake Nasser supplied through Nile River. Available annual water resources of 55.5 BCM is allocated to Egypt by 1959

*Water Agreement*, however, due to prolonged Sahelian drought, inflows to Lake Nasser will be reduced and it will be difficult to receive the allocated water resources to Egypt.

III.2. *Rehabilitation and Improvement Project* at Ihnasia district in Beni Suef governorate aims at removing the present problems and constraints of the existing delivery water system on equitable water supply, improving the overall efficiency of water use by reduction of water losses, and improving irrigation application for the achievement of optimum crop production and contribution in revitalizing the regional economy and also sharing a part of the national strategy on the adjustment of economic structure of the country.

#### IV. PROJECT OBJECTIVES

IV.1. The project of Improvement of Irrigation in the command area of El Maasra and Miana canal left bank of Bahr Youssef is formulated in order to fulfil the people requirements in the project area, solve the problems they are suffering from, and to satisfy the following objectives:

- The increase of the agricultural productivity and food security due to the adequate distribution of water among farmers in the proposed command area and saving lands by using PVC pipe meskas;
- Improving the irrigation system efficiency by applying continuous flow instead of the rotation system;
- Increasing the water conveyance efficiency and reducing the water losses and solving the problems of on-farm management;
- Increasing the acceptance and the popularity of irrigation improvement on the long run by involving the users in operating and maintaining the branch canals;
- Improving the production and farmer’s income and reducing operation and maintenance costs.

#### V. PROJECT DESCRIPTION

V.1. The project is formulated and its components are defined to satisfy its objectives considering the targets for increasing system efficiency, increasing the agricultural productivity and saving water by using the following means:

- Land levelling using laser techniques;
- Upgrading canals cross-sections, intakes, outlets and related hydraulic structures;
- Making use of water resources available within the set hydraulic catchment area (surface, underground and agriculture drainage water reuse);
- Applying continuous flow instead of rotation systems;
- Using one point lifting at the intake of tertiary canals;
- Involve water users in operation and maintenance through *Water User Associations* (WUAs).

V.2. The project comprises the improvement of the existing control structures, application methods of land levelling, rehabilitation of main branch canals (by lining the canals and rehabilitating its control structures such as gates and weirs), rehabilitation of ditches (meskas) (by using elevated lined ditches or low pressure pipes), and the establishment of the WUAs.

V.3. The estimated water saving of this project equals about 0.5 BCM, expected to reach 3.0 BCM/year by the year 2017 after applying it to all old lands. The project is expected to be executed during two years. The required technical and ordinary manpower is available in the project area.

## **VI. ESTIMATED PROJECT COSTS**

VI.1. The cost of the project components including improving the main irrigation network and the on farm irrigation one is estimated to be LE28.57 million. A percentage of 70% (about LE20m or US\$3.42m) would be a foreign grant, whereas the 30% (about LE8.57m or US\$1.47m) would be a local government participation.