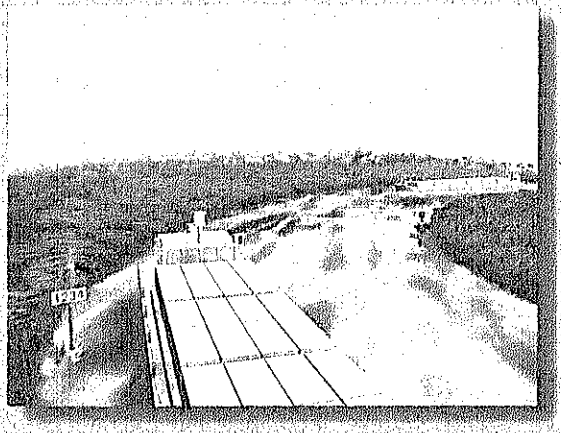
社会開発調査部報告書

Japan International Cooperation Agency (JICA)
River Transport Authority (RTA)

FINAL REPORT

EXECUTIVE SUMMARY

THE DEVELOPMENT STUDY ON THE INLAND WATERWAY SYSTEM IN THE ARAB REPUBLIC OF EGYPT



March 2003

The Overseas Coastal Area Development Institute of Japan (OCDI)
Pacific Consultants International (PCI)

Executive Summary

The Development Study on the Inland Waterway System in the Arab Republic of Egypt

(December, 2001 through March, 2003)

Main Conclusions and Recommendations

1. In recent years, inland waterway transport (IWT) sector has been in decline while road transport has been rapidly increasing. With road congestion becoming an increasingly serious problem, the Egyptian government intends to develop or revive IWT to ease road traffic and take advantage of IWT's advantages of "economical" and "environment-friendly" nature.

2. To materialize the above governmental policy, the Study aimed at proposing ways to promote IWT in order that Egyptian transport sector will successfully improve as a whole. In the Delta area, the Study concluded that IWT system should put great emphasis on the efficient link with major seaports, in order to meet the increase in overseas trade cargoes and to improve the transportation between seaports and Greater Cairo Region (GCR) as the industrial arteries of the country.

3. The Study formulated the short term plan with a target year of 2010, on the basis of the master plan for 2020. In the short-term plan, the following projects should be launched as the first-phase program in Alexandria/Cairo IW (inland waterway) in order to facilitate the modal shift from road to IW.

- **The dredging & bank protection works in Nobaria/Beheiry canal** (Alexandra/Cairo IW)
  To make transport by existing barges safer and more reliable, it is recommended to dredge and improve unsafe spots in Alexandra/Cairo IW immediately.
- **The installation of navigation aids in Alexandra/Cairo IW**
  To enhance the time-competitiveness of IWT, it is recommended to provide navigation aids for assisting night navigation along this IW as soon as possible.
- **The construction of Ather El Nabi river port**
  To make IWT more active, it is necessary to cultivate new markets such as container and general cargo. It is recommended to construct a new public river port for handling both commodities at Ather El Nabi.
- **The extension work of the Small Maritime Lock at Alexandria Port**
  To further enhance the transportation efficiency, cost competitiveness of IWT, the study proposed the introduction of "large-sized single-unit" barges. It is recommended to extend the Small Maritime Lock, in order that new barges will pass the lock safely.

4. All the infrastructure projects are considered to be economically feasible from the viewpoint of the national economy of Egypt, as well as the criteria of the funding/assistance schemes from overseas countries or international aid agencies.

5. "Large-sized single-unit" barges will be introduced by the private sector. In terms of the viability of barge business, it is expected to bring in sufficient returns on investment in barge building due to its shipbuilding price and greater cost-competitiveness.

1. Background of the Study

Egypt has been the economic center of Mediterranean Arab countries from ancient times. To achieve future economic growth, the Egyptian government is making an attempt to promote trade liberalization and expansion by fully utilizing its strategic location.

In the Nile Delta area, major seaports are playing paramount roles in coping with such growth in overseas trade. Under these circumstances, the most important task of inland transport is to provide economical and efficient accessibility from/to major seaports. Therefore, it is vitally important for the government of Egypt to prepare/implement appropriate strategies for improving the IWs between the GCR and major seaports, as well as making use of these IWs for cargo transportation.

Although Egyptian government has gradually strengthened IWT sector by utilizing its advantages, the cargo volumes and modal share of IWT have been declining.

In this regards, the Government of the Arab Republic of Egypt requested the government of Japan to elaborate the development plan to the promotion of IWT. In response, the Japan International Cooperation Agency organized the Study Team and carried out the Study to formulate the Development Plan of the Inland Waterway System.

2. Main Objectives of the Study

- To formulate a conceptual development plan with a target year of 2020
- To formulate a master plan in the Delta area with a target year of 2020
- To formulate a short term development plan and to implement a feasibility study in the Delta area with a target year of 2010

3. Basic Strategies

To solve existing problems in IWT sector, the following strategies are taken up in the IWT development plan.

No. 1	**To avoid excessive investment in the improvement of IW facilities** **-To prioritize IWs (inland waterways)-**
No. 2	**To target specific commodities as the cargo to be transported by barges**
No. 3	**To improve related infrastructures by public sector**
	(1) To strengthen accessibility to seaports: **-To improve IWs' facilities-, -To establish the night navigation system-**
	(2) To develop a new connection IW
	(3) To develop a public river port in GCR
No. 4	**To enlarge the size of barges to the maximum extent that the physical conditions of improved IW facilities will permit** **-To increase the loading capacity-, -To enable barges navigate in the open sea area between El Dekheila and Alexandria ports**
No. 5	**To improve management and operation in IWT**
	(1) To provide government programs to support IWT
	(2) To improve the managerial and operational system of RTA

4. IWT Development Plan in the Delta Area (Master Plan & Short-term Development Plan)

4.1 To improve related infrastructures by public sector

It is recommended to improve or develop the following IWT infrastructures in the Delta area:

1) Improvement works in Alexandria/Cairo IW, 2) Construction work of a public river port in GCR and 3) Construction work of new Bolin connection canal

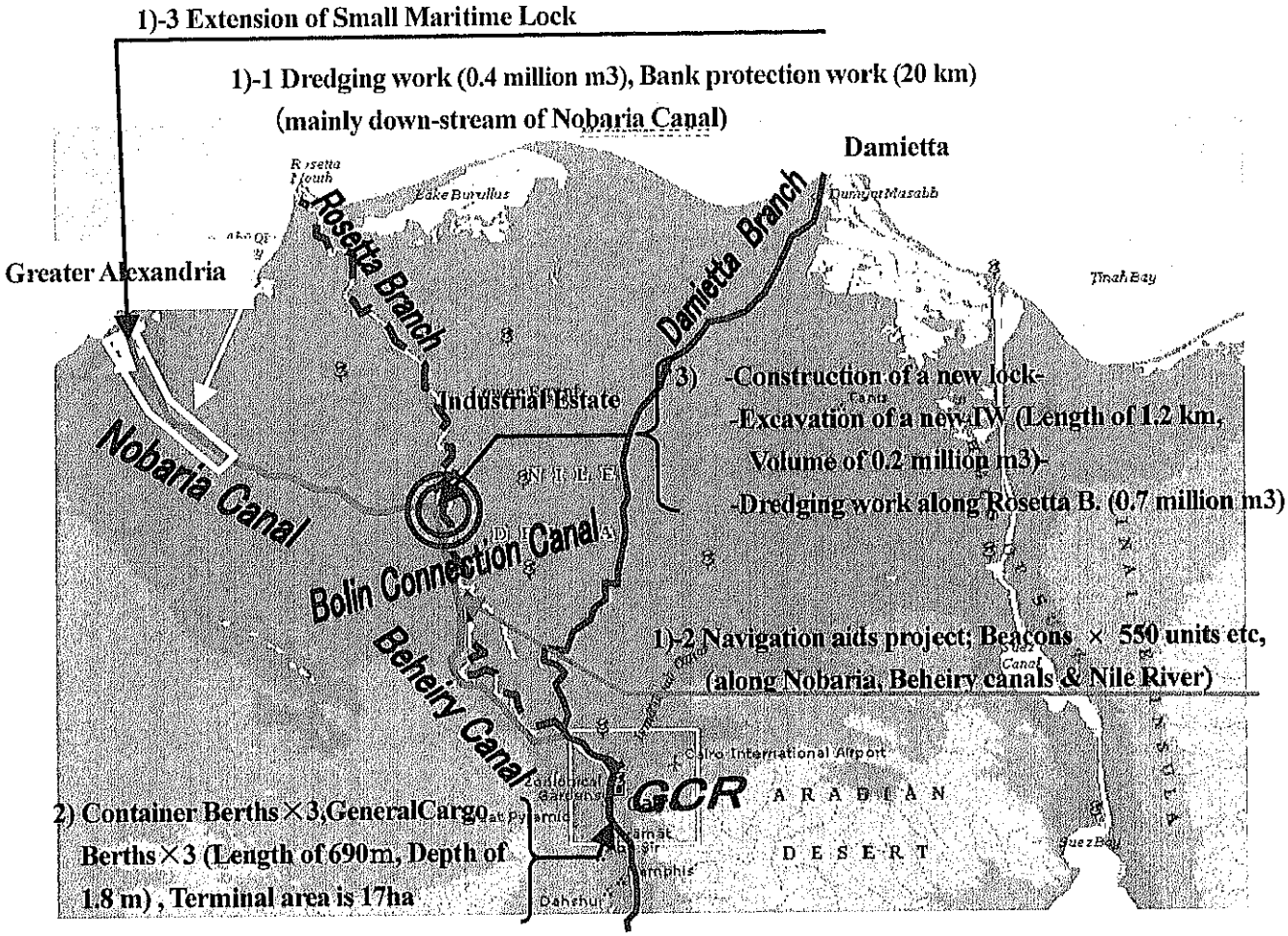


Figure S-1 Location Map of Proposed Projects in Master Plan for 2020

1) Improvement works in Alexandria/Cairo IW

1)-1 Dredging Work & Bank Protection Work

Purpose: It is proposed to dredge Alexandria/Cairo IW in order to secure safe and smooth navigation. It is necessary to conduct this project within the target year of 2010 in the Short-term plan.

- **Dredging and appurtenant works:** Alexandria/Cairo IW has not been improved since its commencement in the mid-70s, except for some minor maintenance works. At present, unsafe spots with insufficient width or depth in this IW can hinder existing barges from safe navigation. Therefore, to enable both existing barges and proposed larger barges to navigate safely and smoothly, this IW should have a **Design Depth of 2.0 m, and a Design Width of 36 m**.
  Required dredging work will focus on an approximately 60 km stretch, the downstream of Nobaria Canal.

Dredging volume and required length of bank protection are estimated at 355 thousand m3, and 21 km respectively.

1)-2 Installation of navigation aids along Alexandria/Cairo IW

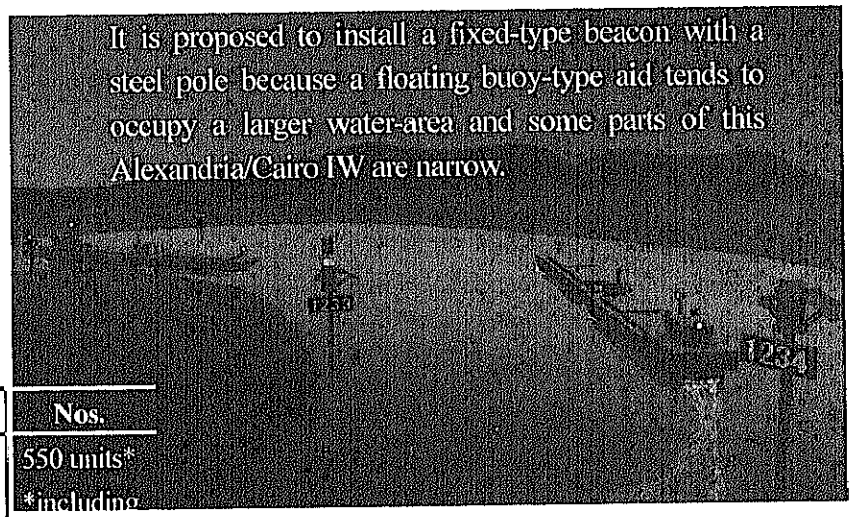
Purpose: It is proposed to install navigation aids along Alexandria/Cairo IW in order to improve time-competitiveness for both day and night operations. It is necessary to conduct both projects within the target year of 2010 in the Short-term plan.

➢ **Installation of navigation aids:**

There are no navigation aid facilities for assisting night navigation along this IW.

It is vital to provide adequate navigation aid system as soon as possible to secure 24 hour operation as well as safe and sound navigation.

The number of main aids are as follows:



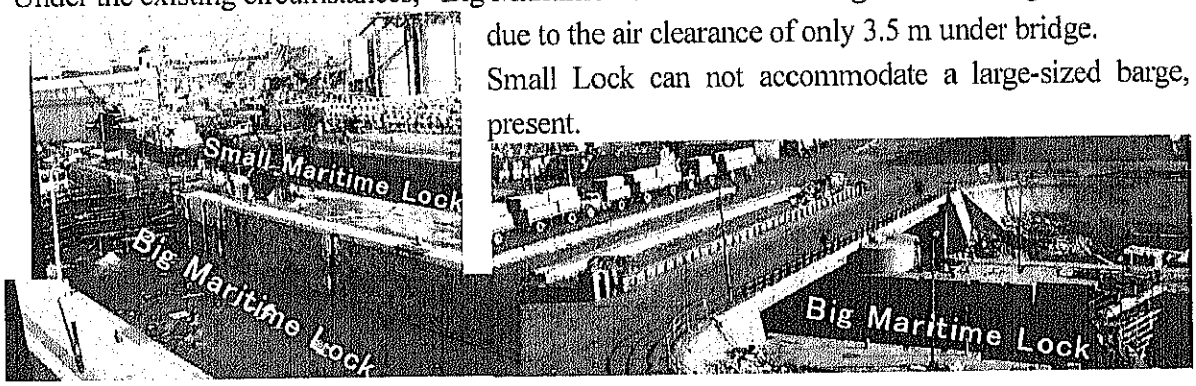
Item	Nos.
Interval of Fixed-beacon	550 units*
-Straight section- 500 m	*including
-Meandering section- 250 m	spares

1)-3 Extension of Small Maritime Lock at Alexandria Port

Purpose: It is proposed that "Small Maritime Lock" be extended offshore in order that a container barge can be free from the existing limitation of air clearance under bridge when the lock is filled with water. It is recommended to execute its extension project within the target year of 2010.

Under the existing circumstances, "Big Maritime Lock" can hinder high stacked barge from entering, due to the air clearance of only 3.5 m under bridge.

Small Lock can not accommodate a large-sized barge, at present.



Chamber size to be extended: When the extension is carried out, new extended lock will have a length of 120 m, width of 16 m and air clearance of 6 m under bridge.

2) Development of a public river port in GCR

- It is forecasted that IWT can gain a 23 % share of the target cargo flow between GCR and Alexandria or Damietta ports in 2020, which is equivalent to a cargo volume of 6.6 mil. MT (4.2 mil. MT flows between Alex. and Cairo, and the remainder 2.2 million MT is carried between Damietta/Cairo)

Among others, **container cargo** and **general cargo** are estimated at **428 thousand TEUs** and **555 thousand ton** respectively. Both commodities should be handled at a public river port which should be constructed by RTA.

- The required facilities and equipment for 2020 are summarized in the following table.
- It is proposed that the public river port be developed at Ather El Nabi because this site has advantages in terms of access to main roads in the core of Cairo City, and ease of establishing a customs area. In addition, the site area is owned by RTA.

Table S-1 Required facilities of public river port for 2020

Container Terminal (Terminal Area;14.5ha)
3 Berths (length of 345 m , depth of 1.8m), Movable Crane [4]
General Cargo Terminal (Terminal Area;2.5ha)
3 Berths (length of 345 m , depth of 1.8m), Truck Crane [4]

- In the year 2010, it is forecasted that **138 thousand TEUs** of **container cargo** and **263 thousand ton** of **general cargo** will be handled at at Ather El Nabi port.
- The required facilities and equipment for 2010 are summarized in the following table.

Table S-2 Required facilities of public river port in 2010

Container Terminal (Terminal Area;5ha)
2 Berths (length of 230 m , depth of 1.8m), Movable Crane [2]
General Cargo Terminal (Terminal Area;1.5ha)
2 Berths (length of 230 m , depth of 1.8m), Truck Crane [4]

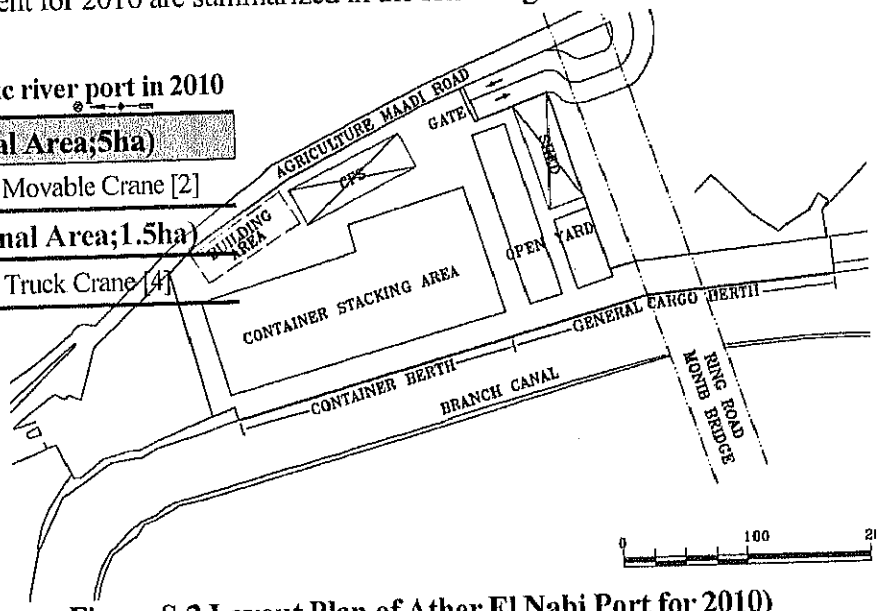


Figure S-2 Layout Plan of Ather El Nabi Port for 2010)

3) Bolin new connection canal

(direct connection between the Central Delta and Upper Nile or Alex.)

Purpose: It is proposed to excavate the existing spillway from Beheiry canal to Rosetta Branch, to provide new connection IW route for the Central Delta such as the industrial estate. The purpose of this new IW is to transport new cargo from Upper Egypt to the Central Delta as well as directly connect the Central Delta and Alexandra Port.

3)-1Construction of new lock & new barrage:

The purpose is to control the differential water-level of approx. 6.5 m between Beheiry canal and

Rosetta Branch.

Chamber size of a new lock: Length of more than 102m, width of 17m.

3)-2 New connection IW:

Design depth of 2.3m, Design width of 2.3 m and excavated volume is 0.2 million m3.

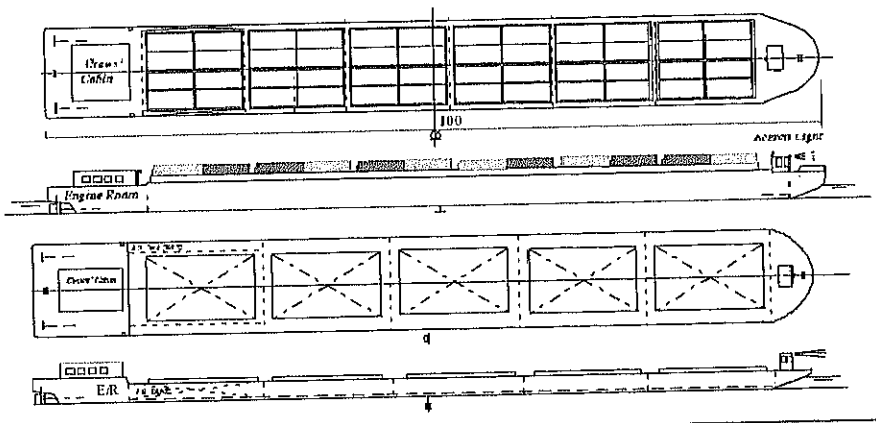
3)-3 Dredging work in a part of Rosetta Branch:

Required dredging volume is estimated at 0.7 million m3 approximately.

4.2 To enlarge the size of barges to the maximum extent that the physical conditions of improved IW facilities will permit by barge operators

It is proposed that "large-sized single-unit" type barges be introduced by private operators, major advantages of proposed barge are as follows:

1) Maximum Size of New Barge in IWT: Length of 100 m × Width of 12 m × Draft of 1.6 m, and Air Draft of 4.45 m are determined as the maximum dimensions of the new barge. The new barge will have double the loading capacity of the present standard type.



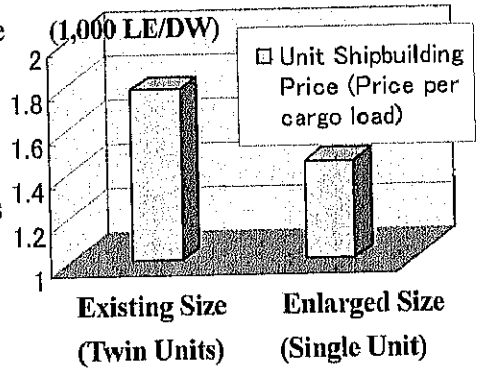
Dimensions
Length 100 m × Width 12 m × Draft 1.6 m,
Depth 2.3 m (Depth 3.8 m*),
1,450 DW (1,260 DW*),
Loading Capacity is 96TEU

*Dimension/Capacity of coastal-going barge within short-range

2) Major Advantages of New Type Barge over existing one

- **To materialize container transport:** The new barge can compete favorably with road and railway from the viewpoint of transport cost per container. Moreover, it is possible to carry containers from/to El Dekheila Port with coastal-going performance (within only short-range).

- **To cultivate new IWT market by improvement of cost-competitiveness:**
  It is vital for bulk transportation to enlarge size of barges because Large-sized single unit enables IWT to gain new market of bulk cargoes by taking advantage of greater cost-competitiveness. Comparing shipbuilding prices between small-sized and new large-sized barges, the latter is expected to bring in larger returns on investment in barge building .



- **To allow navigation even during the low-discharge period**
  This type of barge has shallow draft of 1.6 m despite its increased loading capacity. This new barge can navigate fully loaded even during the low-discharge period. This results in the improvement of its cost-competitiveness against trucks.

4.3 To improve management and operation in IWT

It is recommended that the government introduce several programs to facilitate modal-shift to river transport, and RTA also should improve its managerial and operational system to support IWT market activities. It is essential to introduce such a program in order to successfully materialize and manage proposed infrastructure projects.

1) Government's inducement measures for promotion of modal-shift

1)-1 Establishment of soft-loan program to support IWT

It is recommended that the government set up **"IWT Promotion Fund"** and offer soft loans (low-interest loans) to operators who wish to build new barges. When this fund is established, there is a strong possibility that barge operators will invest in shipbuilding even under the recession of the IWT market.

1)-2 Establishment of coordination/cooperation system with related organizations

It is recommended that the government establish some kind of committee to coordinate the interests of related organizations. An "**IWT Promotion Coordination Committee**" is expected to adjust both navigational use and other utilization of water resources at the stages of policy/planning, decision making and implementation.

This committee should include the following members; **RTA** (River Transport Authority), **MOT** (Ministry of Transport), **MWRI** (Ministry of Water Resources and Irrigation), **MWRC** (National Water Research Center), **NRI** (Nile Research Institute) and **Ministry of Tourism** -

It is recommended to set up **"IWT Promotion Association"** composed of IWT related business groups. This association is expected to assist in public relations, finding a new market and other business promotion activities.

In addition, it is recommended that the government accelerate the privatization of barge operators and related business groups in order to enhance the market principle in the IWT sector. Moreover, it is recommend improving the administration system of road traffic in order to control the increase in the number of vehicles.

2) Improvement Plan of Managerial and Operational System of RTA

2)-1 Twenty-four (24) hour operation of locks

To gain new commodities among target cargo, it is proposed that IWT sector introduce night operation in order to overcome its lower time-competitiveness as much as possible:

- It is proposed to operate 11 locks in Alexandria/Cairo IW and Damieta/Cairo IW on the basis of 24 hour operation, and RTA should give the commencement of its 24-hour operation of both IWs the highest priority.
- Among the 11 locks, three are controlled by MWRI. To manage two prioritized IWs in a uniform manner, it is recommended that the 3 locks now operated by MWRI be placed under the control of RTA.

2)-2 Strengthening Branch functions by transferring Headquarter authority

It is proposed that partial authority be transferred from Headquarter to Branch offices step by step in

order to strengthen Branch functions.

2)-3 Introduction of Management Information System (MIS)

It is proposed to introduce "MIS" system which will be necessary for RTA to record and analyses data of IW facilities, statistics of arrival/departure of barges.

2)-4 Establishment of Tariff System

It is desirable that RTA secure enough revenue to at least cover ordinary expenses. It is recommended that RTA examine the following tariff system to increase their revenue:
-Land lease tariff-, **-Canal entrance dues-** and **-Navigation aids charge -**

2)-5 Capability Building Program for RTA

RTA has not enough capabilities to manage proposed projects successfully. It is recommended to make up a capability building program for RTA immediately. Its program will indicate which of the fields is being focused by the overseas aids, how the technical assistance is being implemented for RTA including Regional Institute for River Transport.

5. Project Cost

The estimated cost of each component project in short- term plan for 2010 is indicated in Table S-3.

Table S-3 Project Cost	Short term project Up to 2010
1) Alexandria/Cairo IW project	116.6 million LE
2) Ather El Nabi port project	97.5 million LE
3) New Bolin Connection Canal project	81.2 million LE

6. Economic and Financial Evaluation

6.1Economic Evaluation (EIRR) of the short-term plan

A comparison between the "Without" case and "With" case was carried out to evaluate the economic feasibility of the following projects from the viewpoint of the national economy of Egypt:

The results of the calculation of EIRR are as follows.

1) Alexandria/Cairo IW project	19.0%
2) Ather El Nabi port project	10.5 %
3) New Bolin Connection Canal project	17.7 %

Consequently, all projects are considered to be economically feasible from the viewpoint of the national economy of Egypt. In addition, annual benefits brought about by above short term projects are estimated at 8 million USD in consideration of only the saving in transportation costs.

6.2 Financial Evaluation (FIRR)

Regarding the Ather El Nabi port project, the result of the calculations of FIRR of RTA is 6.2 %.
FIRR of RTA exceeds the average rate of 4.9 % under a soft loan and the projects are thus financially feasible.