

Republic of Iraq
General Company for Ports of Iraq (GCPI)
Ministry of Transport (MOT)

DATA COLLECTION SURVEY
ON
PORT SECTOR DEVELOPMENT PLAN
IN
IRAQ

FINAL REPORT
SUMMARY

June 2012

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Nippon Koei Co., Ltd. (NK)
Oriental Consultants Co., Ltd. (OC)

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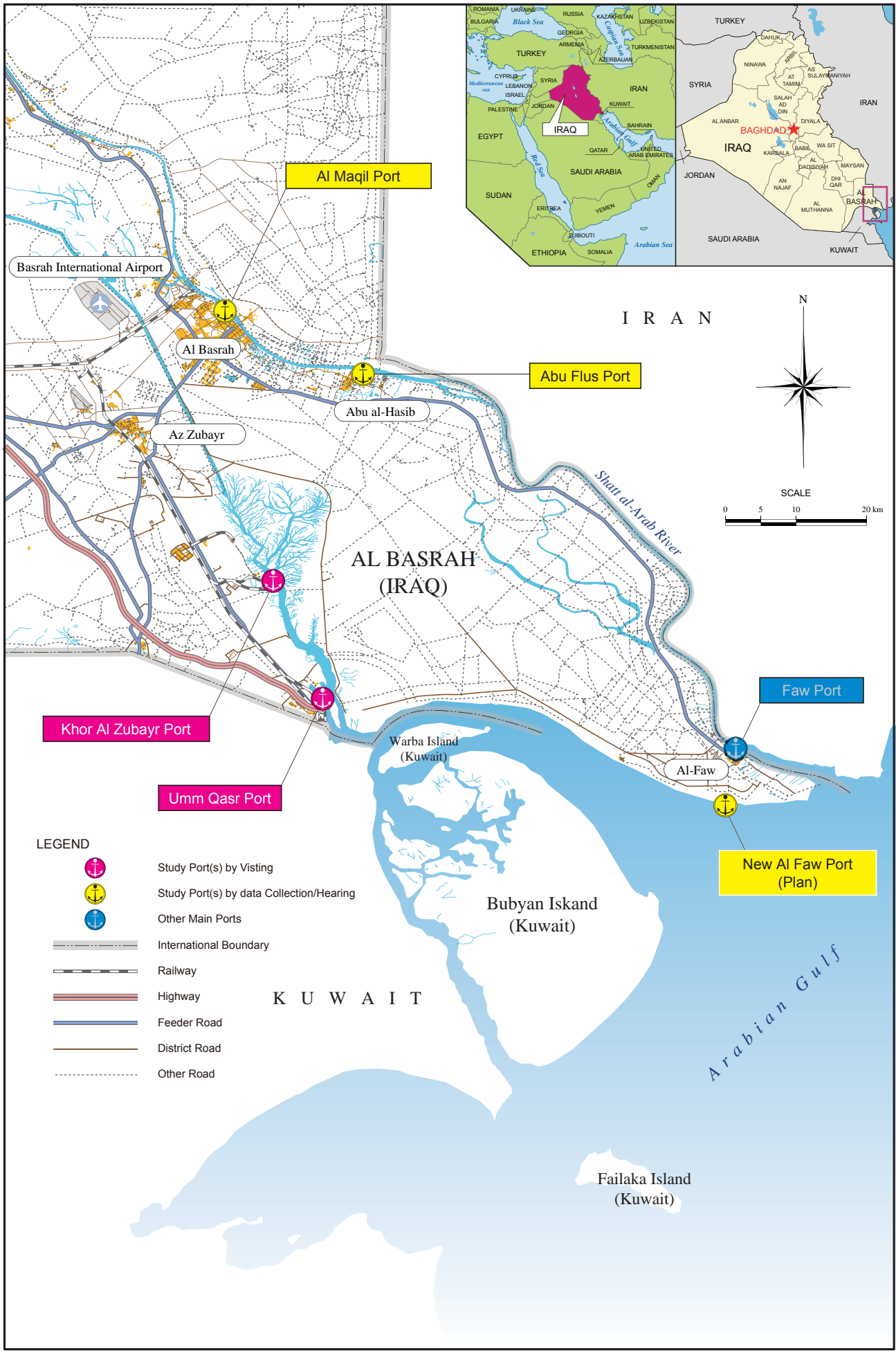
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LOCATION MAP OF STUDY AREA

Data Collection Survey on Port Sector Development Plan in Iraq

Summary

Location Map of Study Area

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1. BACKGROUND AND OBJECTIVES OF THE STUDY

1.1. BACKGROUND OF THE STUDY

Iraq has a short coastline of about 48 km lying between the national boundaries of Iran and Kuwait, with all its ports situated within Al Basra Province. As a physical distribution base, ports are key infrastructure necessary for the recovery of Iraq's national economy. The port facilities in Iraq have plummeted in efficiency because of the long-term war, and suspension of new investment/maintenance due to economic sanctions. As a result, more than 70% of imported commodities rely heavily on inland transportation through neighboring countries. The National Development Plan (2010~2014) issued in 2010 aims at the restoration of port facilities from their severe condition, and to increase the port's competitiveness through rehabilitation of existing channels and port facilities.

The Umm Qasr Port (UQP) is the biggest foreign trade port in Iraq, and its development is in progress through the Iraq Port Sector Rehabilitation Project Phase I under the Japanese Official Development Assistance (ODA) loan, which aims to recover port operation functions and increase the port's efficiency. As a result of this project, the handling capacities of cargos will be improved. Also, counterpart trainings for persons concerned in the General Company for Ports of Iraq (GCPI) will be simultaneously conducted in order to improve port operations and their management capability.

On the other hand, it is expected that the volume of cargoes in Iraq will increase greatly, and the enhancement of cargo handling capacity at ports would be urgently solved. The Khor Al Zubayr Port (KZP), which is the second largest international trading port in Iraq, has not been functioning well and its handling capacity does not meet the cargo demand. In addition, there are several issues on its port operations and management system such as ship dispatch control, customs clearance, and efficiency of terminal operation system.

Based on the above background, this Data Collection Survey (herewith referred as the Study) is carried out to collect information that are important for the enhancement of port operations and management capability. The collected information are then organized and utilized for the port development plan prepared by the Government of Iraq. The Study for Development of Southern Ports in Iraq Post Phase I Development Plan prepared under the Iraq Port Sector Rehabilitation Project Phase I is referred in the Study.

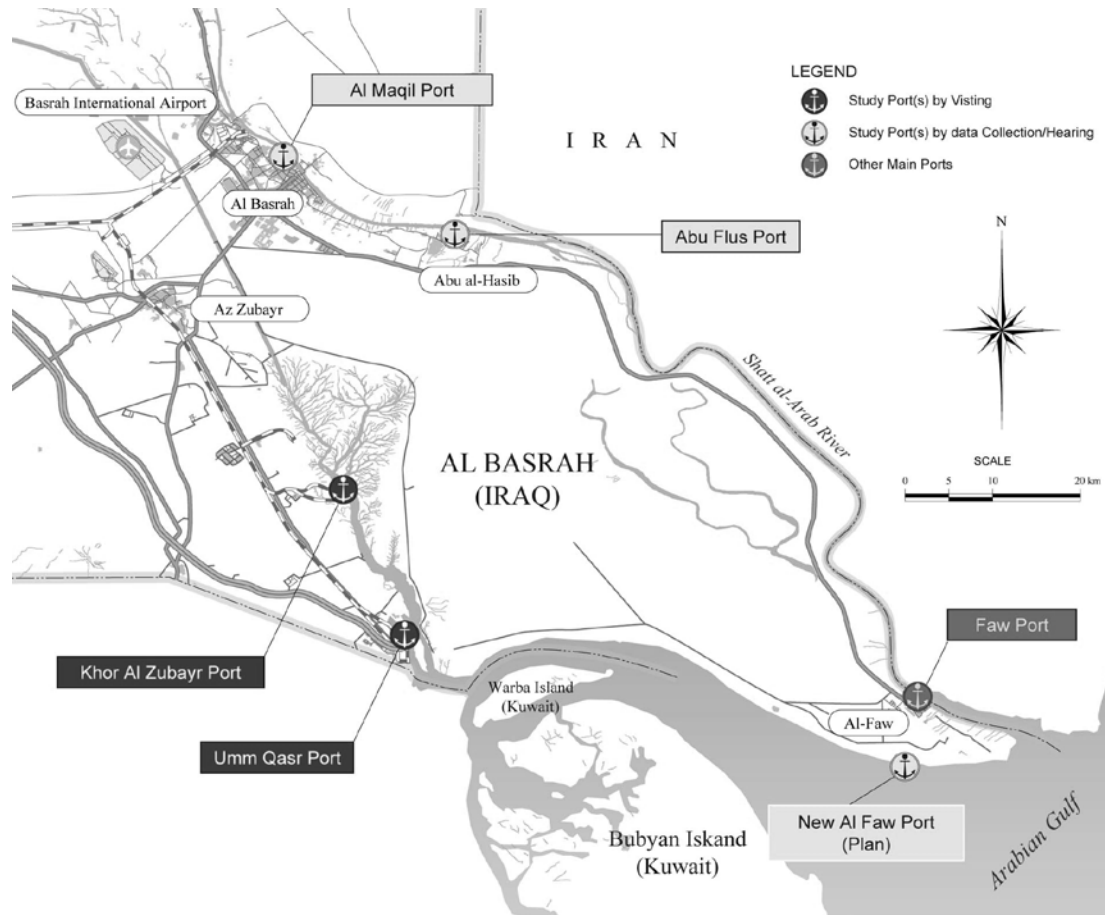
1.2. OBJECTIVES OF THE STUDY

The main objectives of the Study are to collect information for the enhancement of port operations and management capability, and arrange them in order to support the port development plan prepared by the Government of Iraq. The following points are focused on:

- To collect information on the present situation of the port sector in Iraq and review them.
- To have a understanding of the operation and management system of the GCPI, and examine the issues on the system.
- To recommend an improvement plan for the enhancement of port operations and management capability.
- To review the KZP restoration plan proposed in the Study for Development of Southern Ports in Iraq Post Phase I Development Plan, and conduct supplementary survey for the formation of the next restoration step.

As shown in Figure 1.1, the Study covers the ports in Iraq, mainly UQP, KZP, Al Maqil Port, and the new Al-Faw Port, which is under planning. The Faw Port was excluded from the main ports because it will be

replaced by the new Al-Faw Port.



Source: JICA Study Team

Figure 1.1 Survey Area

The Study has been carried out in three phases as discussed below.

Phase-1: Data Collection and Preliminary Examination on:

- Port development plans;
- Physical distribution, maritime transportation and demand forecast;
- Port operations and management plan;
- Preliminary design of port facilities;
- Procurement and cost estimates; and
- Environmental considerations.

Phase-2: Review on Present Port Operations/Management System and Restoration Plan for KZP

- Issues on present port operations and management system;
- Issues on port services, customs clearance and logistics; and
- Review of the restoration plan for KZP, demand forecast, design of port facilities, project cost, and environmental considerations.

Phase-3: Proposal on Port Operations/Management System and Restoration Plan for KZP

- Recommendations on issues on the present port operations and management system;

- Examination on issues on port services, customs clearance, and logistics; and
- Preparation of the restoration plan for KZP including rough estimate of the project cost, procurement methods, and environmental issues.

The report in the Study consists of;

Part 1: Background and Present Situation of Ports In Iraq

1. Background and Objectives of The Study
2. Current Conditions of Iraq
3. Present Situation of Ports In Iraq
4. Trends of Marine Transport and Cargoes

Part 2: Cargo Traffic Forecast and Conceptual Plan of Ports Development

5. Prospects of Cargo Traffic Demand
6. Current Port Development Plans
7. Conceptual Plan of Ports Development

Part 3: Port Management and Operation

8. Present Situation on Port Management & Operation
9. Improvement Plan on Port Management & Operation
10. Capacity Building Plan

Part 4: Review of KZP Development Plan

11. Review of Long Term Development Plan for KZP
12. Urgent Development Plan
13. Project Cost and Implementation Schedule
14. Environmental Consideration on Urgent Development Plan

Part 5: Recommendation on Step Forward

15. Recommendation on Step Forward

2. CURRENT CONDITIONS OF IRAQ

2.1. SOCIOECONOMIC CONDITIONS

(1) Population

The average annual growth rate of population between 1995 and 2000 was 3.30% per year, while the growth rate for ten years between 2000 and 2010 was 2.87% per year. The population in 2010 was estimated at 31.7 million. The number of population per region in 2009 is shown in Table 2.1

Table 2.1 Distribution of Population in Iraq in 2009

Region of Iraq	States and Provinces	Number of Population in 2009 (x 1000)	Percentage of the Total Population (%)
North	Three states	5,678	17.7
Middle	Baghdad City	7,181	22.4
	Wasit	1,158	3.6
	Dijala	1,371	4.3
	Al Anbar	1,452	4.5
	Others	4,101	12.8
South	Basra state and other states	11,164	34.7
Total		32,105	100.0

Source: Central Organization for Statistics and Information Technology (web)

(2) Gross Domestic Product (GDP)

According to the JICA study report entitled the Basic Study on the Program Formulation for Reconstruction and Rehabilitation of Infrastructures in Iraq (Project Study Phase I), the International Monetary Fund (IMF) data and statistics, and the World Bank, the GDP and social economic index in Iraq from 1995 to 2010 are as shown in Table 2.2 below.

Iraq's GDP increased at a rate of about 34.5% from 1995 to 2000, but then fluctuated from 2000 to 2010 at an annual growth rate of -0.9%.

Table 2.2 Trend of Economic Index in Iraq from 1995 to 2010

Item	1995	2000	2005	2010
Population (million)	20.54	23.86	27.36	31.67
Annual growth rate (%/year)	NA	3.04	2.78	2.97
GDP per capita (USD)	1,063	1,389	1,124	2,531
Rate of increase (%)	NA	30.7	-19.1	225
GDP (USD million)	48,657	25,857	19,014	23,583
Annual growth rate (%)	NA	-11.88	-5.96	4.40

Source: Basic Study on the Program Formulation for Reconstruction and Rehabilitation of Infrastructures in Iraq, JICA (Project Study Phase I), IMF Data and Statistics, and the World Bank.

2.2. TRANSPORT SECTOR

(1) Transport Policy and Plan

The main transportation axes in Iraq run from northwest to southeast, from Mosul via Kirkuk to Baghdad, and then south to Basra and the Arabian Gulf. According to the National Development Strategy for 2005-2007 prepared by the Ministry of Planning and Development Cooperation of Iraq, the social and economic reforms for the reconstruction and economic development, the development policies of the transportation sector were proposed as stated below.

The transport sectors in Iraq are composed of roads with a total length of 40,690 km, two international and three major domestic airports, six seaports, two oil terminals, and railways with a total length of 2,456 km. Though the road network accommodates about 70% of all traffic in Iraq, its existing facilities are under undeveloped conditions. The transportation and communication networks in Iraq should be modernized and expanded with domestic and international connections. The Ministry of Transportation (MOT) planned to implement the following policies on transportation with a development program for the privatization of some activities in the sector, particularly in the field of communications, and the different modes of transportation include land, sea, and air.

Port Sector

- Continue ongoing restoration and rehabilitation projects in and around UQP and KZP,
- Remove wreckages in the Shatt Al Arab channel and UQP with the most environmentally sound way possible, and
- Develop a master plan to increase efficiency and optimize the institutional arrangement of ports and inland waterways.

Land Transportation

- Explore the potentials of developing a bus rapid transit system and dedicated bus lanes.

Railway Sector

- Rehabilitate key railway stations, refurbish rolling stocks, and maintain equipment,
- Modernize the railway training center in order to develop the skills of railway staff, and
- Prepare a railway strategy to assess the merits for restructuring the present system to permit for greater private sector participation into the delivery of services.

Airport Sector

- Develop airport and civil aviation strategies coupled with a master plan which should include a rehabilitation plan of facilities and future institutional arrangement with the possibility of outsourcing airport management to private operators, and
- Retrain supervisory and operational staff, particularly in the area of suspended activities, previously such as aviation and maritime fields.

(2) Major Routes of Import Cargoes to Iraq

Iraq has been historically and geographically connected with its neighboring countries through transportation infrastructure. Goods have been traded and people have travelled among countries. Transportation infrastructure such as roads and railways have been developed and have formed network connections between Iraq and its neighboring countries.

The following three routes for transporting imported cargoes to Iraq were considered as the main routes to distribute them to the corners of the entire nation:

Route 1: Syria and Turkish Corridors

- For the central to the northern regions, imported cargoes were transported mainly from ports in Syria and Turkey. Majority of imported cargoes to the northern region were transported from ports in Turkey (Mersin Port) and in Syria (Tartous and Latakia Ports).

Route 2: Aqaba Port in Jordan

- For the northern part of Baghdad City and the central region, imported cargoes were transported by land transportation from Aqaba Port in Jordan as well as the ports in Syria and Turkey.

Route 3: Ports in Iraq, primarily UQP

- For the southern parts of the country and eight states in the southern region, imported cargo depended on the ports in Basra Province, which have not yet recovered to their full capacity. Some areas of this region relied upon imported cargoes from Aqaba Port in Jordan and from ports in Kuwait.

(3) The Latest Transport Survey on Trucks

Table 2.3 shows the number of containers from Jordan and Turkey to Iraq, and those handled at ports in Iraq. The number of containers from Aqaba Port in Jordan to Iraq from 2009 to 2011 was referred to the transport survey data on trucks by NAFITH. NAFITH developed and is presently operating the truck control system (TCS) in Aqaba Port which consists of a regulatory framework, physical infrastructure, and IT systems to manage the movement of commercial trucks entering the Aqaba Special Economic Zone, and to provide a platform for coordinating such activities between freight agents, trucking companies, and truck drivers in a deregulated environment.

Table 2.3 Number of Containers from Jordan and Turkey to Iraq, and those Handled at Ports in Iraq

Year	2004	2009	2010	2011
Number of containers from Jordan (BOX)	40,000	51,525	39,046	54,567
Share (%)	(35%)	(24%)	(16%)	(21%)
Number of containers from Turkey (BOX)	57,000	71,168	74,399	77,777
Share (%)	(49%)	(33%)	(30%)	(30%)
Containers handled at ports in Iraq (BOX)	18,000	90,525	133,508	124,934
Share (%)	(16%)	(43%)	(54%)	(49%)

Source: NAFITH and the Consultants' estimate based on GCPI data

The above table indicates that the proportion of container cargo volume handled at ports to the total imported container volume in Iraq has increased from 16% in 2004 to nearly 50% in 2011, while the proportion of container cargo volume from Jordan and Turkey has dropped sharply, from 35% in 2004 to 21% in 2011, and from 49% in 2004 to 30% in 2011, respectively. It is expected that once operations of the planned container terminals in UQP and the new Al Faw Port has commenced, the proportion of container volumes handled at the ports in Iraq would increase remarkably, say nearly 70% in 2015 and over 80% in 2025 and 2035.

Table 2.4 shows the average numbers of trucks per month by cargo type from Aqaba Port to Iraq between 2006 and 2011. It should be noted that the number of trucks shown in the table is only those registered in Iraq, and does not represent the total number of trucks transporting cargoes to Iraq.

Table 2.4 Average Number of Trucks per Month by Cargo Type from Aqaba Port to Iraq

(Unit: no. of trucks per month)

Year	2006	2007	2008	2009	2010	2011
Containers	679	468	369	386	649	884
General Cargoes	504	414	456	465	555	698
Others	340	506	615	820	1,269	1,492
Total	1,523	1,388	1,441	1,671	2,473	3,073

Source: NAFITH

According to Table 2.4 the total number of trucks from Aqaba Port to Iraq has increased sharply in 2011, and it was the highest at 3,073 trucks. The growth rate of containers and general cargoes are 5.4% and 6.7% per year, respectively. These rates are quite low compared to the growth rate of the total number of trucks which is 15.1% per year.

Considering the growth rate of container handling volume at ports in Iraq, which was more than 35% per year from 2006 to 2010, it is quite clear that the proportion of handling cargo volume to the total import/export volume at ports in Iraq has grown remarkably especially for container cargoes.

Imported cargoes from Kuwait are being transported by trucks through the Kuwaiti border. According to the records of NAFITH, the total number of trucks from Kuwait was 194,156 in 2010, and 128,400 in 2011. The average number of trucks per day was 532 in 2010 and 352 in 2011. The reason why the number in 2011 was less than that in 2010 was due to the Iraqi's government announcement on the sudden change of law in June 2011. After that, there were no trucks transporting to Iraq. The number of trucks has recovered up to 200 trucks per day in October 2011. The imported cargo volume from Kuwait to Iraq in 2010 was nearly 5.5 million tons with the assumption that one truck bears a load of about 28 tons.

3. PRESENT SITUATION OF PORTS IN IRAQ

3.1. BASIC POLICY OF MARITIME TRANSPORT IN IRAQ

The channel and basin to UQP from the entrance of the channel in Arab Bay was dredged and the wreckages of sunken ships were removed from the channel to make it navigable for 50,000 DWT vessels. It was intended by the Government of Iraq through Japan's ODA loan that the UQP would be restored to its original design capacity and to secure accommodations for ships of adequate size.

In consideration of the recovery of the Iraqi economy, there is a very strong demand to utilize the existing port facilities of KZP in a maximum effective way as well as the restoration of UQP.

After the United Nations Development Programme (UNDP) carried out dredging works and the removal of sunken ships at UQP, it is expected that the cargo handling volume at the port will increase due to the economic reconstruction in Iraq, and subsequently the present cargo handling capability of these ports will become sufficient. Therefore, KZP as well as UQP should be restored to function as the center of the import/export trade distribution system. The access channel to these ports should also be restored so that plenty of urgent goods necessary for Iraq's economic reconstruction can be transported by larger vessels through these ports.

The Iraqi government has expected that the new port facility will be started by channel dredging, removal of wreckages, procurement of necessary equipment and working vessels, and rehabilitation of port facilities. Such works should be done in order to recover the original function of port operations that would handle the urgent aid cargoes necessary for the economic reconstruction.

As a result, the restoration project will bring the efficiency of port operations back to pre-conflict levels in 2003, and establish a framework and mechanisms to enable ports to effectively accommodate future growth and expansion.

In October 2004 at the Tokyo Conference, the Iraqi government officially presented the National Development Strategy (NDS) and reconstruction strategy for the transportation sector, as follows:

- The restoration projects for UQP and KZP were proposed as the highest priorities among all urgent infrastructure development projects in Iraq.
- The restoration projects for KZP as well as for UQP should be prioritized because of their critical role in the recovery and reconstruction of the country.
- Both UQP and KZP are the most important ports in Iraq and have the potential to be major cargo handling facilities in the region. It means that a considerable number of job opportunities would be created in the region due to port activities.
- The 2003 needs assessment stated the necessity of an integrated master plan for port development in the southern region, and private sector participation in port operations.
- The Iraqi government (Ministry of Planning and MOT) had submitted the official requests for technical and financial assistance from the Japanese government since November 2003, and followed up the requests at the bilateral meeting held in Amman in September 2005 between both countries.
- The following projects were carried out by the United States Agency for International Development (USAID), UNDP and Japanese ODA:

- Immediate dredging works at the basin of the north port as part of the Umm Qasr Seaport Project by USAID in 2003;
- Dredging works at the Umm Qasr approach channel by UNDP, and emergency dredging works at UQP by Japanese ODA in order to provide a 12 m draft for 50,000 DWT vessels in 2004-2005; and
- The Iraq Port Sector Rehabilitation Project Phase I for UQP by Japanese ODA in 2009-2012 (ongoing).

In the National Development Plan for 2010-2014, the general objectives of the port development plan are stated as follows, and show quantitative plans for target years 2014, 2018, and 2038 as short-, middle- and long-term plans, respectively:

- Increase the capacity of existing ports and shipping lanes.
- Utilize the available unused capacities of existing ports, which total about three million tons annually, and reduce reliance on ports of neighboring and nearby countries for Iraq's trade by increasing the capacity of the current Iraqi ports.
- Transition to constructing major ports capable of receiving the largest ships; reduce transport costs to make Iraqi ports competitive with alternative ports; and equip one of them with the requirements necessary to act as a dry channel.
- Strengthen the private sector's role in implementing port operations and providing port services.
- Increase the design capacity of Iraqi port docks to target levels of 2014.

The detail objective of port sector development in National Development Plan is described in Chapter 6.

3.2. PORTS OF IRAQ

3.2.1 OVERVIEW

The waterfront in Iraq is limited between the national boundary of Iran and Kuwait, while Iraq's coastline is short at about 48 km. There are five major cargo ports in Iraq such as UQP, KZP, Al Maqil Port, Abu Flus Port, and Al Faw Port, which are located along Khor Al Zubayr channel or the Shatt Al Arab channel in the southern part of Basra Province. Those ports are managing and operating by the GCPI. Apart from these cargo ports, two oil terminals for exporting crude oil such as Al Bakr and Al Amaya are located in the Arab Bay of the Gulf.

Excluding crude oil, the container shipping business is the most strategic sector for future development of national trade in Iraq. The present infrastructure for container sea transport is underdeveloped far below international standards. The container terminals of ports in the Gulf region have a low capacity, particularly lacking a terminal operation/management system and connection system with the global networks.

Port activities were curtailed severely in the 1980s due to the Iraq-Iran war. Before shipping could resume operations, explosives, wreckages, and sedimentation at the bottom of the river of Shatt al-Arab had to be cleared, which will take many years to accomplish. The geographic location of the Iraqi ports supports the idea of Iraq functioning as a gateway or "land bridge" for container transport between countries in East Asia and Eastern Europe.

3.2.2 UQP

UQP is the biggest Iraqi foreign trade cargo port in Iraq and the only port facing the Arab Bay of the Arabian Gulf. UQP is the most multifunctional primary port in Iraq. The port is located close to the border of Kuwait near the entrance of the Arabian Gulf on the west bank of the Khor Al Zubayr River, approximately 90 km upstream from the northwest edge of the Arabian Gulf, and the port is located at a distance of 75 km from the southern entrance in the city of Basra.

Since the completion of the urgent dredging project by UNDP in 2003, 50,000 DWT size vessels have been able to enter UQP during high-tide levels and the function of the port was recovered to a limited extent. However, the required water depth was not achieved for the entire area of the channel and port basin, and consequently, the utilization of cargo handling operations was only 50% of the port sector's former capability.

Siltation in the 50 nautical mile approach channel, with an average depth of 11-11.5 m allowing ships up to 50,000 DWT, was a problem even though UNDP and Japan assisted in dredging and wreckage removal in 2009-2012. The Port of Dubai has also helped to reestablish procedures for passenger and cargo transport.

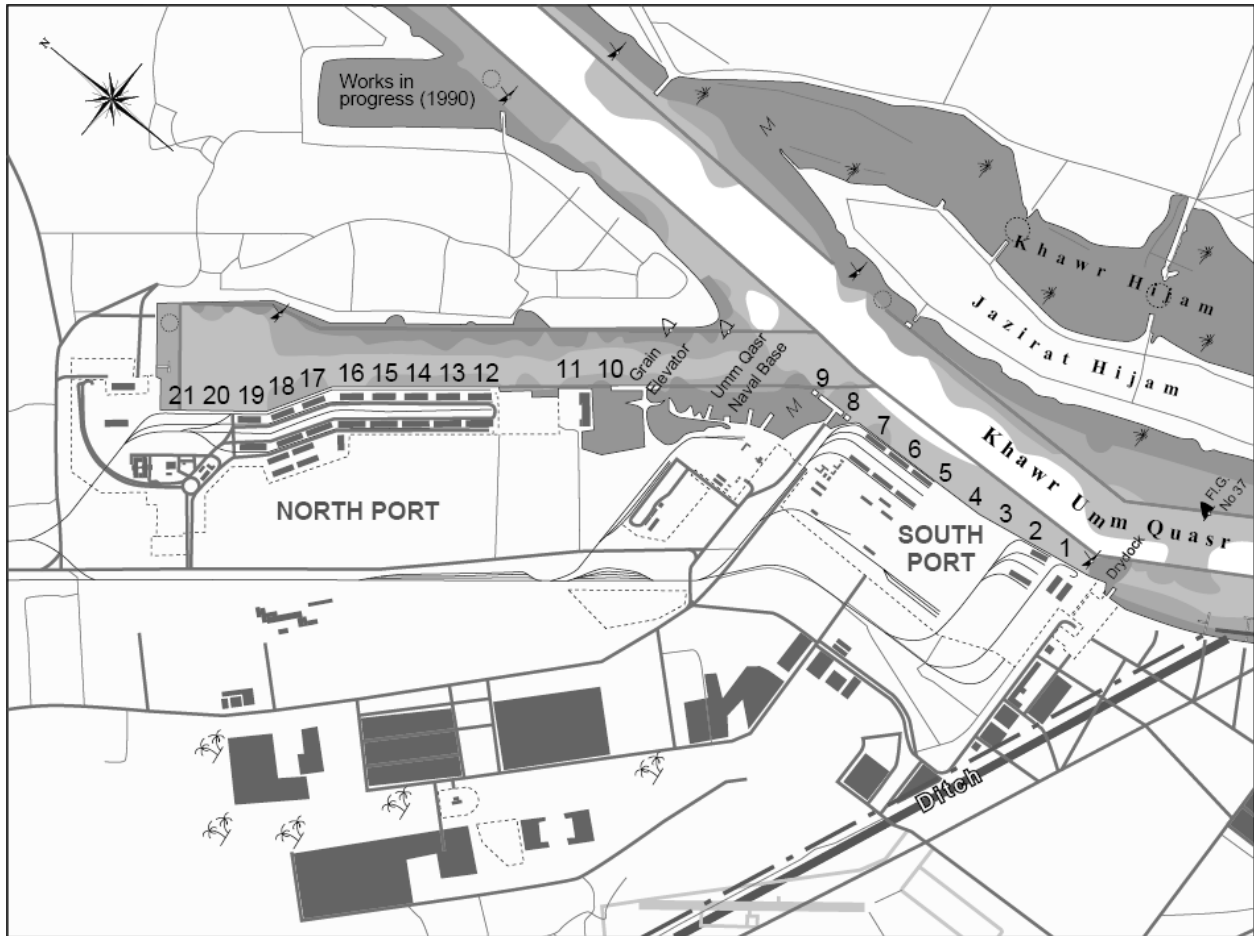


Figure 3.1 Layout of UQP

UQP is now divided into two ports, namely, the South Port and the North Port. The South Port includes ten berths for ordinary goods with container terminal. The GCPI would like to make the South Port as a dedicated port for containers.

Rehabilitation works at berth nos. 4 and 5 have been done. Fender rehabilitation has been completed at berth no. 2. Berth nos. 2 to 4 has been used for general cargo and GCPI has an idea to convert these berths into the container terminal. Concession contracts for berth nos. 4, 5 and 8 have been made.

The North Port has 13 multipurpose berths for commercial use including equipment, transportation links, offices, and warehouses. The berths will include regular cargo berths, container berths and ro-ro berths. The total berth length is 4 km and the length of each berth is 200-250 m. The concession contract of berth nos. 11a and 11b was made with Gulftainer, and the container terminal is under construction.

Water depth at the berth front and the channel of the North Port is maintained at a certain level with yearly maintenance dredging, but the berth front water depth at the South Port remains shallow due to the hard soil condition at the bottom which makes dredging operations unworkable. The planned water depth for the North Port is -12.5 m. Significant sedimentation occurs at the mouth of River 1.

According to a Japanese shipping company, several navigational problems were reported recently due to the shallow water depth and lack of accurate information on the water depths at berth nos. 8, 11, and 13 of UQP.

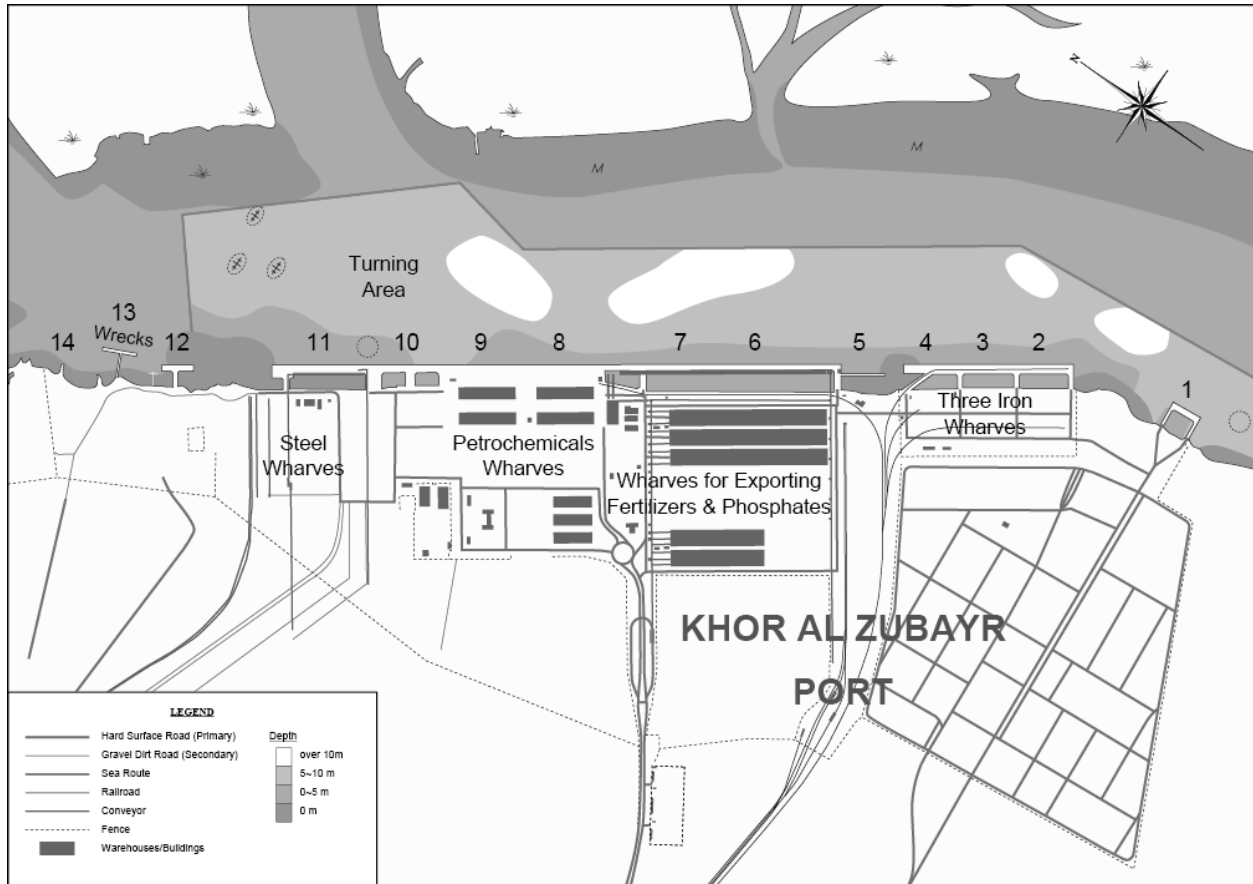
Cargo handling operations for the berth operated by GCPI is supposed to be for 24 hours a day, but currently the operational hours are from 8:00 a.m. to 4:00 p.m. and from 6:00 p.m. to 1:00 a.m. No data were officially obtained from the concessionaire.

Two gantry cranes (G/Cs) made by the Chinese were introduced in 1997 at berth no. 20 for container handling. Another two G/Cs made by Germans were introduced in 2004 at berth nos. 19 to 21 for container handling. Most of the quay cranes (Q/Cs) were installed in 1980 and many of them were no longer in working conditions. The container yard of berth no. 20 is now under rehabilitation as the Phase I Project by Japanese ODA.

3.2.3 KZP

The KZP is located 60 km from the center of Basra City, 105 km from the northern end of the Arabian Gulf, and 12 nautical miles from UQP. Constructed from 1975 to 1980, KZP operated as a free trade zone and industrial port supporting industrial developments in Basrah and its vicinity. Soon after the end of the war in 2003, the general cargo berths were operated by Maersk Sealand Line for two years. Management of port operations was handover to GCPI on March 3, 2005. In 2010 a joint operating contract for berth no. 8 was made with the German company, Marlog.

KZP was designed to handle general cargo and bulk cargoes such as wheat, fertilizer, phosphate and petrochemicals imports/exports, as well as sponge iron and iron ore imports. The port's facilities extend beyond the Q/Cs and warehouses. Bulk handling facilities include conveyors and shiploaders for fertilizer exports and ship unloaders for iron ore imports. The iron ore handling facilities comprise open stockyards located within the port complex, equipped with belt conveyors, stackers, and bucket wheel stackers/reclaimers.



Source: JICA Study Team

Figure 3.2 Layout of KZP

The berth structure was constructed as a detached type on the typical type of river port due to soft layer below existing surface) in order to obtain a river depth of -12 m and minimize maintenance dredging. The berth and land is connected with access bridges. These structures were supported by steel piles which were driven up to -32 m (N value more than 40).

Under the present situation of worn-out and damaged cargo handling equipment, damaged berthing facilities, insufficient communication equipment, and insufficient and damaged water supply facilities, and electric power supply substations, the port would have difficulty in providing effective services and efficient operations.

The port management office of KZP is also short of working vessels like dredgers, tug boats, pilot boats, and suitable cargo handling equipment for bulk cargo and containers. In this regard, the port management office cannot provide efficient service to port users.

The channel between UQP and KZP was developed by dredging to a depth of -12 m. Since then, maintenance dredging has not been carried out for the last ten years, except for partial maintenance dredging which was carried out in this channel by GCPI using their own dredgers from 1998 to 2002. According to the latest survey conducted in 2006 by the Japan External Trade Organization (JETRO), the channel between UQP and KZP, the upstream of the channel has shallow depths from around -8.2 to -8.5 m, and a ship size of 20,000 DWT can be navigated up to KZP. The port basin of KZP is as shallow at around -8.2 m. Six small and large sunken ships are scattered along the existing berthing and basin areas.

3.2.4 ABU FLUS PORT

The Abu Flus Port is rather a relatively small port, consisting of three berths for general cargo. This port started construction in 1974 and completed in 1975 in order to reduce the concentration and overcrowding of the existing ports. The facilities of Abu Flus Port suffers from severe damages caused during the Iraq-Iran war (1980~1988), and successive economic sanctions prohibit the recovery of the port's functions. Full-scale port rehabilitation has been implemented since 2008 and is still in progress.

Rehabilitation of berth no. 1 has not yet been implemented. Rehabilitation of berth no. 2 and a part of berth no. 3 have been finished and are now in service for port operations. Rehabilitation works are still in progress, but partial berth operation has been ongoing in the completed area. Steel pipe piles supported structures with steel plate decks were employed. Steel sheet pile structures were employed as earth retaining walls. The steel piles, steel plate decks, etc. were imported from Turkey either by land transport or ocean shipping. No. 5, which would be used as a container yard, is now under construction and will be completed within 2012. The port is planned for expansion at both sides of the existing berths.

There are six Q/Cs, of which four are non-operational, one is under repair, and only one is in working condition. The one operational Q/C together with mobile cranes or ship gears are used for loading/unloading operations. The port's major imported cargo is containers from Dubai which are serviced five times a week. In 2011, 570,000 tons of cargoes were imported, but only very few cargoes were exported.

3.2.5 AL MAQIL PORT

The Al Maqil Port was founded in 1919 as the first port in Iraq. It is located on the banks of Shatt al-Arab, and is as 135 km away from the northern end of the Arabian Gulf.

There are eight sunken ships along the berth front, and 32 sunken ships along the channel of Shatt al-Arab. There is a floating bridge at the downstream of Shatt Al-Arab, and open/close operations of the gate has to be done when ships would pass.

The port has a total of 15 berths. There are 47 Q/Cs installed at seven berths, but only two Q/Cs are operational. Most of the Q/Cs were introduced from 1970 to 1980, and maintenance works have not been done since then due to the war and lack of materials/equipment for maintenance. Water depth at the berth front is around -9 m ACD.

Berth operations recently resumed at berth nos. 2 and 6 to 15 with the use of mobile cranes and ship gears. Total volume of cargo is small compared with other ports, and according to records in 2011, import through this port was about 500,000 tons/year and export was of a very small amount.

3.2.6 AL FAW PORT

The Government of Iraq has planned for a new Al Faw Port, which would replace the existing Al Faw Port, on the Faw Peninsula where the Shatt Al-Arab meets the Gulf. The intended location has the capacity to be developed into a major international port that would link the Gulf States and Northern Indian Ocean with Central Asia, as well as Europe by rail through Syria or Turkey. Al Faw Port is currently operated by GCPI, which is the operator of all the five commercial ports of Iraq.

3.2.7 NAVIGATIONAL CHANNELS

At several locations in Khawr Abd Allah, sections were shallower and narrower than as planned due to the existence of shipwrecks. The connecting area between the first UNDP dredging project and the second project has been left undredged, thus causing a smaller channel section than was originally designed. Dredging works have not yet been carried out for Khor Al Zubayr. In order to start dredging the

blocking shipwrecks have to be salvaged. Throughout the access channels, navigation aids, which are necessary for safe navigation of ships, have not been properly provided.

At present GCPI owns only one operational cutter suction dredger, and procurement of new dredgers through the Port Sector Rehabilitation Project Phase I under Japanese ODA is now in progress.

Maintenance dredging plans for 2011 include the area of River 1 (UQP), quay front at KZP, UQP's South Port, Khawr Abd Allah channel, Alkhafgah channel, and the new Al Faw Port.

3.3. PORT PROJECTS UNDER IMPLEMENTATION

3.3.1 PROJECTS AND PROCUREMENT FINANCED FROM MOT OWN BUDGET

Ongoing projects funded by own budget by MOT are summarized in Table 3.1.

Table 3.1 Investment Project Plans for 2011(funded in full by the Ministry of Transport)

No.	Project	Total Cost (IQD millions)	Adjusted Allocated Funds for 2011 (IQD million)	Aggregated completion at the end of Aug 2011 (%)
1	Procure cargo handling equipment	70,000	12,050	73
2	Supply and install four desalination unit of 1500 m ³ /unit capacity	10,200	9,375,218	67
3	Study and execute anti-marine pollution plan	15,000	4,495	26
4	Procure marine vessels	112,000	86,876,534	25
5	Improve power supply to the ports	30,000	11,220	75
6	Manage and execute Japan's loan projects	40,000	9,202	26
7	Catholic protection for port quays	37,000	4,573	21
8	Manage and support consultation services and build service quays for Al Faw Port	53,000	2,733	3
9	Rehabilitate Abu Flus Port	32,000	6,712,525	68
10	Rehabilitate the ports quays	21,000	6,415	72
11	Rehabilitate and develop the marine dry dock	9,800	2,931	62
12	Rehabilitate and maintain the water projects at Al Maqal	1,400	428	55
13	Rehabilitate marine vessels	31,000	1,000	98
14	Support oil platform	24,243,611	24,243,611	80
15	Build two new berths at UQP (Berth no. 11a & 11b)	33,000	1,055	60
16	Procure fire engines and safety equipment	7,500	126	50

Source: GCPI

3.3.2 PORT SECTOR REHABILITATION PROJECT UNDER JAPAN'S ODA LOAN

The Iraq Port Sector Rehabilitation Project Phase I funded by Japan's ODA loan has been implemented since 2008. The project is focuses mainly on the rehabilitation and improvement of the Umm Qasr Port

(North Port). It is expected that the originally designed capacity of UQP and KZP in the southern region of Iraq will be recovered by the current ongoing restoration and rehabilitation projects. The current progress situation of the project is indicated in Table.3.2

Table 3.2 Summary for the Port Sector Rehabilitation Project (JICA Loan No.IQ-P1)

Categories	Lots	Lot Names	Descriptions	Contract Price	Unit	Contract Period	Date of Commencement	Date of Completion
(A) Port Related Rehabilitation Works	Lot A	River-1 Dredging at Umm Qasr Port	Dredging to -12.5 m in Umm Qasr Port River 1 in width of 200 m basin in width of 300 m.	47,036,502	EURO	12 months	3 Mar 10	2 Mar 11
	Lot A2	Rehabilitation of TSHD Dredger Basra	Rehabilitation of TSHD dredger 1800 m ³ (to be used for maintaining the dredged -12.5 m water depth in Umm Qasr Port River 1)	5,918,750	USD	6 months	Expecting to start May 2012	Expecting to complete October, 2012
	Lot C	Shipwreck Removal	Removal of four wrecks at navigation channel	14,430,630	USD	12 months	1 May 11	30 Apr 11
	Lot D-1	Port Rehabilitation Works for Marine Civil Facilities	Installation of new fender system, concrete repair for cracks at slabs, etc.	4,103,270	USD	12 months	15 Apr 11	14 Apr 12
	Lot D-2	Port Rehabilitation Works for On shore Civil Facilities	Installation of container stacking blocks, overlay asphalt pavement at container yard, fences, and gate, etc.	1,398,431	USD	12 months	15 Feb 11	14 Feb 12
	Lot D-3	Port Rehabilitation Works for Utilities (water & electricity)	Rehabilitation of drainage system, electricity, and construction of new substation, etc.	8,627,450	USD	15 months	1 Jun 11	31 Aug 12
(B) Procurement of Equipment	Lot B1	Marine Equipment (1)	Procurement of TSHD 3,500 m ³ (1 no.), grab dredger 500 m ³ (1 no.)	86,685,980	EURO	24 months	21 Jan 11	20 Jan 13
	Lot B2a	Marine Equipment (2)	Floating crane 2000 ton	40,895,106	USD	18 months	23 Aug 11	22 Feb 13
	Lot B2b	Marine Equipment (2)	Tug boats 4500 HP (3 nos.), diving boat (1 no), fuel tanker 1,000 ton (1 no.)	59,925,832	USD	20 months	Expecting to start April 2012	Expecting to complete December 2013
	Lot B3	Land Equipment	Mobile crane 150 ton (2 nos.), forklift for ro-ro cargo 7 ton (2 nos.), workshop vehicle (2 nos.), mobile hydraulic platform (1 no.)	650,000,000	JPY	12 months	18 Aug 10	17 Aug 11

3.3.3 OTHER GCPI INVOLVED PROJECTS

(1) Truck Movement Logistic Support Project

A contract agreement for a private sector investment project which aims to control truck movement before arriving at the port main gates is under finalization between GCPI and Nafith Company (Jordan).

The trucks' control points are to be located at Umm Qasr Port, Khor Al Zubayr Port, and border gate in Kuwait. Once the trucks movement control system has been established at the planned locations, a well controlled and accurate cargo movement from/into Iraqi ports will be achieved.

(2) Construction of Single Point Mooring (SPM) for Crude Oil Export

A few SPM construction projects are planned under the Ministry of Oil (one of the projects is under Japan's ODA loan) in order to provide sufficient capacity to export crude oil. GCPI has been involved in supervising the dredging works of the SPM areas and the access channel including necessary installation of navigation aids and maintenance dredging.

The above mentioned rehabilitation/improvement and development works/projects are to be considered in the estimation of cargo handling capacities of respective ports.

4. TRENDS OF MARINE TRANSPORT AND CARGOES

4.1. TRENDS OF MARINE TRANSPORT

(1) Container Ships

According to the Study for Development of Southern Ports in Iraq Post-Phase I Rehabilitation Project, container traffic toward Iraq has been using three major routes, via Iraqi ports, Aqaba Port in Jordan and land routes through Syria and Turkey. It was also reported in the Middle East Economy in November 2011 that Iraq already accounted for about 40% of the volume of containers handled in Aqaba Port. Also, part of the increase of import volume in Iraq has been channeled through Mediterranean ports including Turkish ports and trucked by land through Syria to Iraq. Under these situations, Iraqi port's activities for container traffic are currently limited due to low handling capacity and operational issues. However as mentioned, the increase of east oriented cargoes from China and India to countries in the Middle East and Gulf areas have definitely induced rapid growth of handling volumes in Iraqi ports as well. West oriented cargoes will continue to rely on Aqaba Port and land routes through Jordan and Syria as customers' logistics requirements for transit.

Import statistics in Iraq shows similar origins of cargoes as that in UAE and the Middle East (mainly UAE). Also, South Asia holds a large portion with a share of more than 70%. It is considered that such large volumes are attributed to re-exportation within countries in the Middle East-Gulf and in India. Also, subcontinent cargoes have contributed to this situation as well. It is also noted that exported cargoes from Asian countries have rapidly increased in the past three years from 2007 to 2009 by 250%, and have entirely routed via Iraqi ports.

It is expected that east oriented cargoes would significantly contribute to traffic volume of Iraqi ports in the future more than trade cargoes generated within countries in the Middle East-Gulf.

According to one deep-sea container shipping carrier, their containers are being unloaded at UQP at almost 100%, of which 80% are released at terminal CY. Only about 20% containers are being moved to Baghdad and the other inland delivery points under the carriers' bill of lading. This means that most containers are being transported from the port to a destination in Iraq under the responsibility of local forwarders.

Major deep-sea carriers have provided feeder service to UQP from Jebel Ali Port after transshipping from their mother vessels. Most operated feeder vessels have called not only at UQP but also other Gulf ports including Shuwaikh and Shuaiba in Kuwait and Masleed in Qatar. However, some carriers have operated shuttle feeder vessels between Jebel Ali Port and UQP.

Port statistics of UQP in 2010 described that the number of loading/unloading of containers per vessel had increased by a monthly average of 4.3% following the growth of the total handling volume. It was realized that the tonnage/capacity of feeder vessels have been upgraded to comply with this demand. It was expected that shipping carriers are continuously increasing the capacity of their feeder vessels as long as the demand is increasing.

Iraqi ports have also been dealing with the issue of imbalance equipment. Such issue is much more serious at Iraqi ports than at Jebel Ali Port, which is rather comfortable in view of hub ports. Under this situation, the opportunity to have direct calls of mother vessels may be initiated, but it is quite uncertain because the hub port functions of Jebel Ali and Salalar Ports have been working very well due to their geographical advantage for access, efficiency in operations, and capacity.

(2) Oil and Gas Products

Iraq has imported oil refinery products such as benzene, kerosene, gas oil, and gasoline of nearly one million tons through KZP. The maximum size of carriage tankers is about 50,000 DWT (=30,000 GRT) with an unloaded volume of nearly 20,000 tons. No tanker has ever called at UQP. Import volume is expected to increase following Iraq's economic growth.

(3) Wheat

Iraq is one of the agricultural countries in the region. Demand of wheat in Iraq was previously covered by its domestic production. However in recent years, Iraq has been importing wheat of 3 to 4 million tons a year. More than a half of the import volume has moved through UQP. According to port statistics of UQP by GCPI, 70,000 DWT bulk ships have carried imported wheat, and 54 and 37 vessels have called at UQP for discharge of nearly 50,000 tons per vessel in 2009 and 2010, respectively. The Government of Iraq is encouraging domestic production in order to satisfy domestic demands by 2014 without having to import; however its progress is uncertain because due to the competitive cost of foreign wheat.

(4) Cement

Domestic production of cement was previously achieved at a rate of about 700 million tons, but after several wars it drastically dropped at 2.4 million tons in 2004. The national recovery demands supply sources and currently relied on import of foreign products. Imported cement has been shipped using bulk ships, general cargo ships, and land transportation. It was recognized that UQP and KZP have handled a large portion of imported cement. The United Nations estimated the annual demand at 24 million tons in their past planning. Under this situation, the handling volumes of both ports are expected to increase.

UQP has received large carriage ships with sizes of around 72,000 DWT. Also, various types of vessels (with sizes from 4,000 to 70,000 DWT) loaded with cement have called at the port.

(5) Rice

Iraq has been recognized as one of the biggest rice importing countries as it has been importing nearly 1 million tons of foreign rice per year from South and Southeast Asia. UQP is the gateway for rice import as it has received 50,000 DWT bulk ships in 2010 with discharge of 31,000 tons per vessel.

(6) Vehicle

The market for brand new cars in Iraq is still underdeveloped due to the country's high import tax, however the market for used cars has been expanding and growing as the US government deregulated the export of cars to Iraq. Jebel Ali Port has functioned as the distribution point in the Middle East-Gulf as they have large auction markets at free trade zones. It was reported that UAE has re-exported around 17,000 cars to Iraq in 2007. Iraq is recognized as to be the top country among UAE's re-export customers. Europe has also been also a supply source for shipping used cars.

Port statistics showed that 110 and 92 car carriers called at UQP in 2009 and 2010, respectively. The vessels were of various sizes. The maximum size of ship was 30,000 DWT with a loading capacity of 2,000 cars.

4.2. TRENDS OF VESSELS CALLING AT IRAQI PORTS

Table 4.1 shows the main vessels calling at Iraqi ports in 2009 and 2010. According to the table, the maximum vessel sizes are 30,251 DWT for container ships, 27,000 DWT for pure car carriers (PCCs), 41,450 DWT for tankers, and 74,577 DWT for bulk carriers.

Table 4.1 Main Vessels Calling at Iraqi Ports in 2009 and 2010

Vessel Name	Vessel Type	DWT	Container Capacity (TEU)	Max. Draft	Port	Port Statistics
AS CASTOR	Container Vessel	18,445	1,129	9.0	UQP	2010
SIMA PRIDE	Container Vessel	16,449	1,221	9.0	UQP	2010
DELMAS SWALA	Container Vessel	15,166	1,049	9.0	UQP	2010
APL ORCHID	Container Vessel	18,437	859	10.0	UQP	2010
MAERSK ARKANSAS	Container Vessel	17,375	1,068	8.0	UQP	2010
LUICINE GA	Container Vessel	16,833	1,221	9.0	UQP	2009
SIMA KAROON	Container Vessel	30,251	1,278	11.0	UQP	2009
SEA WAYS VALOUR	Container Vessel	14,140	1,167	9.0	UQP	2009
LA POLOMA	Container Vessel	21,648	1,661	10.0	UQP	2009
SIMA YAZD	Container Vessel	26,634	1,170	11.0	UQP	2009
ASIAN SUN	PCC	13,293		8.0	UQP	2010
HOEGH MASAN	PCC	12,500		6.8	UQP	2010
PATRIOT	PCC	15,600		7.7	UQP	2010
ALLIANCE BEAUMONT	PCC	27,000		8.5	UQP	2010
HIGH LAND	Tanker	41,450		7.8	KZP	2010
DOBTLESS	Tanker	40,794		10.1	KZP	2010
CAL PRIDE	Bulk Carrier	72,493		7.7	UQP	2010
PLOYNEOS	Bulk Carrier	69,999		12.1	UQP	2010
ISMINAKI	Bulk Carrier	74,577		12.2	UQP	2010

Source: GCPI and Shipping Carrier HP's Website

5. PROSPECTS OF CARGO TRAFFIC DEMAND

5.1. LATEST CARGO STATISTICS OF PORTS IN IRAQ

5.1.1 TREND OF CARGO VOLUMES IN IRAQ PORTS

According to Table 5.1, the total cargo volumes in Iraqi ports reached 10.12 million tons in 2001. After that, the total cargo decreased in volume until 2003 with a handling volume of 1.81 million tons. The total cargo volume then increased after making the lowest volume in 2003 and recorded the highest volume of 11.94 million tons in 2006. The latest cargo handling volume was 10.31 million tons in 2010.

Table 5.1 Trend of Cargo Volumes and Ship Calls in Iraqi Ports

Year	Umm Qasr Port			Khor Al Zubayr Port			Total		
	Cargo Volume (x 1,000 tons)	Share by UQP (%)	Ship Calls	Cargo Volume (x 1,000 tons)	Share by KZP (%)	Ship Calls	Cargo Volume (x 1,000 tons)	Annual Growth	Ship Calls
1997	3,173	93	222	248	7	1,264	3,421		1,486
1998	3,913	96	295	163	4	1,101	4,076	19	1,396
1999	3,843	90	287	406	10	1,295	4,249	4	1,582
2000	6,022	86	397	989	14	2,520	7,011	65	2,917
2001	7,001	69	533	3,114	31	4,319	10,115	44	4,852
2002	6,083	77	512	1,804	23	4,258	7,887	-22	4,770
2003	1,682	93	512	129	7	44	1,811	-77	556
2004	2,105	55	894	1,737	45	780	3,842	112	1,674
2005	3,244	64	503	1,857	36	945	5,101	33	1,448
2006	7,659	64	858	4,294	36	1,307	11,953	134	2,165
2007	6,310	59	876	4,395	41	1,069	10,705	-10	1,945
2008	7,595	65	898	4,032	35	1,006	11,627	9	1,904
2009	7,662	70	1,146	3,291	30	900	10,953	-6	2,046
2010	7,513	73	1,106	2,804	27	736	10,317	-6	1,842

Source: GCPI

5.1.2 CARGO STATISTICS OF UMM QASR PORT (UQP) AND KHOR AL ZUBAYR PORT (KZP)

Table 5.2 shows cargo handling volumes between 2006 and 2010 in UQP. The total cargo volumes in UQP reached 7.65 million tons in 2006 and the range continued from 6.31 to 7.66 million tons in 2007 until 2010.

It is noted that from 2006 to 2010, the handling volume of container cargoes has been more than three times. Cargoes in UQP are almost imported and the export cargoes have not been recorded for the last five years.

Table 5.2 Cargo Handling Volumes in UQP

(Unit: MT)

Cargo Item/Year	2006	2007	2008	2009	2010
Import Cargo					
1. Containers (TEU)	819,573 (69,060)	823,475 (69,956)	1,562,767 (132,118)	1,817,238 (178,378)	2,776,358 (231,014)
2. Conventional Cargo					
(1) Grain (wheat)	2,858,509	2,324,035	3,279,105	2,898,591	1,800,999
(2) Rice	917,806	668,736	960,670	954,342	947,383
(3) Sugar	393,850	734,920	568,310	260,327	455,656
(4) Cement	1,959,179	749,341	444,850	889,980	456,734
(5) Steel & Pipes	67,875	62,692	183,832	121,967	347,461
(6) Vehicles	40,051	3,417	44,326	94,636	100,136
(7) Other Conventional Cargo	601,969	943,796	551,442	624,469	628,330
(Sub-total)	6,839,239	5,486,937	6,032,535	5,844,312	4,736,699
Total Discharged	7,658,812	6,310,412	7,595,302	7,661,550	7,513,057
Export Cargo					
1. Container (TEU)	(69,060)	(69,956)	(132,118)	(178,378)	(231,014)
2. Conventional Cargo	0	0	0	0	0
(1) Grain	0	0	0	0	0
(2) Other Conventional Cargo	0	0	0	0	0
(Sub-total)	0	0	0	0	0

Source: GCPI

Table 5.3 shows the cargo handling volumes between 2006 and 2010 in KZP. The import cargoes have increased gradually for the last five years and the export cargoes have decreased sharply. According to port statistics, a marked decrease of the export cargoes was caused by a decrease in fuel oil export.

Table 5.3 Cargo Handling Volumes in KZP

(Unit: MT)

Cargo Item/Year	2006	2007	2008	2009	2010
Import Cargo					
1. Containers (TEU)	10,327 (855)	26,634 (2,206)	34,201 (2,832)	16,215 (1,336)	18,216 (1,500)
2. Conventional Cargo					
(1) Grain (wheat)	2,400	6,800	14,043	14,770	10,307
(2) Rice	38,978	19,590	7,903		
(3) Sugar	25,482	109,464	133,727	86,578	91,325
(4) Date	100,000	100,000	107,937	162,761	141,413
(5) Cement	912,417	745,449	585,862	981,981	1,202,245
(6) Iron (steel & pipes)	0	147,425	178,805	328,947	146,251
(7) Vehicles	1,435	0	0	0	0
(8) Other Conventional Cargo	378,483	240,028	300,977	381,400	160,344
(Sub-total)	1,459,195	1,368,756	1,329,254	1,956,437	1,751,885
3. Liquid Bulk (petrochemical products)	649,025	934,276	735,239	574,049	866,164
Total Import	2,118,547	2,329,666	2,098,694	2,546,701	2,636,265
Export Cargo					
1. Containers (TEU)	855	2,205	2,832	1,250	1,440
2. Conventional Cargo					
(1) Date	65,000	65,000	65,000	65,032	65,403
(2) Other Conventional Cargo	119,653	111,481	56,130	19,630	13,884
(Sub-total)	184,653	176,481	121,130	84,662	79,287
3. Liquid Bulk (fuel oil)	1,990,300	1,888,447	1,812,521	660,090	88,077
Total Export	2,174,953	2,064,928	1,933,651	744,752	167,364
GRAND TOTAL	4,293,500	4,394,594	4,032,345	3,291,453	2,803,629

Source: GCPI

5.2. FUTURE SOCIOECONOMIC FRAMEWORK FOR THE TARGET YEARS IN IRAQ

5.2.1 POPULATION

The population of Iraq in the year 2010 was estimated to be 31.7 million. The average annual growth rate was 2.87% for the period of 2000-2010. In this demand forecast, the future population growth rates were estimated using the reference World Population Prospects; the 2010 Revision by United Nations. The average annual growth rates towards the respective target years are as follows;

- Average annual growth rate of 3.15% in the period of 2010-2015;
- Average annual growth rate of 2.83% in the period of 2015-2025;
- Average annual growth rate of 2.40% in the period of 2025-2035.

Table 5.4 Population Forecast up to 2035

Year	2000	2005	2010	2015	2020	2025	2030	2035
Population (x1,000)	23,857	27,359	31,672	36,977	42,684	48,885	55,257	61,977
Annual Growth Rate (%)	2.87		3.15		2.83		2.40	

Source: World Population Prospects; The 2010 Revision by United Nations

5.2.2 GROSS DOMESTIC PRODUCT (GDP)

The gross domestic product (GDP) of Iraq in the year 2010 was estimated to be IQD 38,658 billion (USD 23,583 million). The average annual growth rate was -0.9% for the period of 2000-2010. The future annual growth rate of GDP in 2011-2016 is estimated using the IMF Data.

- Average annual growth rate of -0.9% in the period of 2000-2010
- Average annual growth rate of 10.1% in the period of 2010-2016

The future GDP is estimated using the annual growth rate of 5.5%, 7.5%, and 8.5% for low growth scenario, medium growth scenario and high growth scenario, respectively, based on the Study for Development of Southern Ports in Iraq Post-Phase I Rehabilitation Project by GCPI. The projected GDP is shown in Table 5.5

Table 5.5 Future GDP and Growth Rate

(Unit: USD million and 2000 constant prices)

	2010	2015	2025	2035
GDP				
a) Low growth case (5.5% per year)	23,583	30,822	52,648	89,931
b) Medium growth case (7.5% per year)	23,583	33,857	69,780	143,820
c) High growth case (8.5% per year)	23,583	35,461	80,176	181,277
GDP per capita (USD)	2,531	4,823	8,361	11,952

Source: JICA Study Team

5.3. DEMAND FORECAST BY MACRO ANALYSIS

Future cargo demand is closely related to the socioeconomic activities in the port hinterland. The future cargo volume by macro analysis is estimated based on the correlation between GDP in the region and cargo volumes through both ports (UQP and KZP). It is noted that all the cargoes handled at both ports would be international trading cargoes like import or export.

Table 5.6 Demand Forecast by Macro Analysis

Case and Year	GDP (USD million)	Forecast Cargo Volume (x1,000 MT)
Low Case		
2015	30,822	14,131
2025	52,648	30,396
2035	89,931	58,180
Medium Case		
2015	33,857	16,393
2025	69,780	43,163
2035	143,820	98,337
High Case		
2015	35,461	17,588
2025	80,176	50,910
2035	181,277	126,250

Source: JICA Study Team

5.4. DEMAND FORECAST BY MICRO ANALYSIS

5.4.1 PREMISES AND SUMMARY

The target years in demand forecast have been set to the years 2015, 2025, and 2035. It is expected that the restoration projects are to complete between 2010 and 2015. Subsequently, the short to medium-term development plans will be carried out until 2025 and the target year to implement the long-term development plan is set on 2035.

Based on the above, the cargo demand is estimated generally with the following steps:

- Step 1: The entire demand is estimated by commodity such as container cargoes, general cargoes, and bulk cargoes for the target years 2015, 2025, and 2035 based on the relationship with population and GDP in Iraq;
- Step 2: The demand is allocated in three regions (northern, middle and southern part of Iraq) depending on the number of population in each region and the location of ports in neighboring countries,
- Step 3: The estimated cargo volume is allocated to the objective ports in Iraq in accordance with the present commodity being handled and the ratio of the handling volume in the objective ports.

The resulting figures in the cargo demand forecast are summarized in Table 5.7 followed by its breakdown of cargo items.

Table 5.7 Forecast Cargo Volumes for Ports in Iraq

Cargo Item/Year	Unit	UQP				KZP			
		2010	2015	2025	2035	2010	2015	2025	2035
Import Cargo									
1. Containers (include Export)	TEU	231,014	628,000	2,120,000	5,194,000	1,584	10,000	34,000	84,000
2. Conventional Cargo									
(1) Grain (wheat)	MT	1,800,999	3,814,000	5,539,000	7,403,000	10,307	15,000	22,000	30,000
(2) Rice	MT	947,383	844,000	1,461,000	1,920,000	0	0	0	0
(3) Sugar	MT	455,656	485,000	641,000	813,000	91,325	92,000	121,000	154,000
(4) Date	MT	0	0	0	0	141,413	0	0	0
(5) Cement	MT	456,734	1,021,000	2,534,000	4,126,000	1,202,245	1,137,000	2,824,000	4,598,000
(6) Steel & Pipes	MT	347,461	886,000	3,044,000	7,489,000	146,251	708,000	2,430,000	5,981,000
(7) Vehicles	unit	15,770	244,000	359,000	491,000	0	0	0	0
(8) Other Conventional Cargo	MT	628,330	955,000	1,974,000	3,449,000	160,344	419,000	867,000	1,513,000
3. Liquid Bulk Cargo (petrochemical products)	MT	0	0	0	0	866,164	1,686,000	1,686,000	1,686,000
Total Import Cargo	MT	4,636,563	8,005,000	15,193,000	25,200,000	2,618,049	4,057,000	7,950,000	13,962,000
Total Import Cargo except Oil	MT	4,636,563	8,005,000	15,193,000	25,200,000	1,751,885	2,371,000	6,264,000	12,276,000
Container	TEU	231,014	628,000	2,120,000	5,194,000	1,584	10,000	34,000	84,000
Vehicle	unit	15,770	244,000	359,000	491,000	0	0	0	0
Export Cargo									
1. Conventional Cargo									
(1) Date	MT	0	0	0	0	65,403	60,000	110,000	312,000
(2) Other Conventional Cargo	MT	0	0	0	0	13,884	65,000	65,000	65,000
2. Liquid Bulk Cargo (fuel oil)									
Total Export Cargo	MT	0	0	0	0	167,364	1,171,000	2,428,000	5,228,000
Total Export Cargo except Oil	MT	0	0	0	0	79,287	125,000	175,000	377,000
Container	TEU	231,014	628,000	2,120,000	5,194,000	1,529	10,000	34,000	84,000

Source: JICA Study Team

5.4.2 COMPARISON OF FORECAST BY MACRO AND MICRO ANALYSES

The forecast volume excluding liquid bulk cargoes by micro analysis is compared with the result of the low/medium/high case in macro analysis. The container in TEU is converted into metric ton by 11.5 ton/TEU and the vehicle in number by 6.35 ton/unit.

Table 5.8 Comparison of Forecast by Macro and Micro Analyses

Year	Macro Analysis (x1,000 ton)		Micro Analysis (x1,000 ton)
2015	(Low)	14,131	19,502
	(Medium)	16,393	
	(High)	17,588	
2025	(Low)	30,396	48,683
	(Medium)	43,163	
	(High)	50,910	
2035	(Low)	58,180	101,668
	(Medium)	98,337	
	(High)	126,250	

Source: JICA Study Team

The forecast volume excluding liquid bulk cargoes by micro analysis in 2015 exceeds the volume in the high case of macro analysis by nearly 10%, while the forecast volume by micro analysis in 2025 and 2035 ranges between the medium case and the high case of macro analysis.

The micro analysis of the traffic forecast based on the commodities is considered to be aggressive in some degree, but is also a reflective of the cargo movements through the ports. Therefore, the micro analysis results will be used for planning the port development and project analysis.

6. CURRENT PORT DEVELOPMENT PLANS

The following development plan in Iraq, which related key port developments are described in this chapter.

- The National Development Plan (2010 – 2014)
- Post-Phase I Development Plan (The Study for Development of Southern Ports in Iraq Post-Phase I Rehabilitation Project)
- New Al Faw Port Master Plan

6.1. THE NATIONAL DEVELOPMENT PLAN

The National Development Plan for the Years 2010-2014 (NDP) by the Iraqi government is referred to.

6.1.1 VISION

The vision of the NDP is for Iraq's main and secondary ports to meet the nation's import and export needs; are able to compete with the ports of neighboring and nearby countries; and act as a starting point for Iraq's dry channel linking Asia, Europe, Turkey, and Syria.

6.1.2 OBJECTIVES

(1) General Objectives

- Increase the capacity of existing ports and shipping lines,
- Utilize the available unused capacities of existing ports, which total about three million tons annually, and reduce dependence on the ports of neighboring and nearby countries for foreign trade by increasing the capacity of current Iraqi ports,
- Transition to constructing major ports capable of receiving the largest ships; reduce transport costs to make Iraqi ports competitive with alternative ports; and equip one of them with the requirements necessary to act as a dry channel, and
- Strengthen the private sector's role in implementing, operating, and providing port services.

(2) Quantitative Objectives

- Increase the design capacity of Iraqi port docks to planned target levels by 2014,
- Construct the new large port of Al Faw during the plan period, and
- Remove sunken vessels in shipping lanes as well as those close to docks during the plan period .

6.1.3 MEANS OF ACHIEVING THE OBJECTIVES

(1) Construction of the New Large Port of Al Faw

(2) Allocation of Funds Necessary to Develop, Expand, and Modernize Existing Ports or Open Them to Investments

(3) Implementation of Procedures to Enhance Performance, Modernize Operating Methods, and Remove Obstacles to become Activity, Using the Following Means:

- Contracting with a global consulting firm specialized in providing advice, proposals, and solutions to increase the efficiency and performance of GCPI, including its role as regulator and monitor of private sector performance, so it can compete with companies in neighboring and nearby countries,
- Providing maritime services needed by oil ports and liquid gas ports in Khor Al Zubayr,

- Deepening, excavation, and establishment of marine channels leading to the port and establishing visual and electronic control systems for ship and vessel movement,
- Upgrading ground handling equipment to achieve the required cargo handling capacity,
- Upgrading and enhancing the marine unit fleet that provides marine services to ports, provided this upgrade includes offshore excavators, tugboats, signal ships, lead ships, passenger boats, connection boats, and workboats,
- Introducing modern electronic port management and operation systems,
- Preparing a comprehensive plan to train and qualify port staff, develop new qualified staff, and implement a training institute in the ports,
- Recovering all sunken vessels from shipping lanes in Khawr Abd Allah, Khor Al Zubayr, Shatt al-Arab, and Shatt al-Basrah,
- Developing and modernizing shipyards and boat slips in ports, completing projects under construction, and constructing new shipyards that meet ship repair requirements,
- Modernizing ports' provision of housing, water, and public services to importers, exporters, and port workers, and
- Reconsideration of surplus workers and staff.

6.2. POST PHASE I DEVELOPMENT PLAN

6.2.1 DEVELOPMENT SCENARIO OF PORTS IN IRAQ

Post Phase I Development Project has been prepared by GCPI to make further port development scenario continuous to develop the port sector in the Iraq subsequent to develop the port sector in Iraq after Port Sector Rehabilitation Project Phase I.

The development scenario of ports in Iraq by Post Phase I Development Project is proposed in Table 6.1.

Table 6.1 Development Scenario of Ports in Iraq

Category	Short-term and Long-term Development Scenarios
Applicable to Ports in Iraq	Conducting the master plan study for the long-term development of national ports in Iraq: <ol style="list-style-type: none"> 1) Review the present function and identify the future function of each port including traffic forecast 2) Prepare the master plan for Umm Qasr, Khor Al Zubayr, Maqil (Basra), and Abu Flus port including alternative development in the southern region after development of UQP/KZP at a reasonable level 3) Provide the development program of the port facilities and navigational channel development 4) Study the port development and management by PPP 5) Study the introduction of the appropriate and transparent tariff system 6) Study the maintenance dredging strategy in the channels 7) Feasibility study of the alternative port development in UQP/KZP 8) Study the function and restoration program of Maqil Port (Basra) and Abu Flus Port by dredging the channel and removing wrecks in the river 9) Prepare the training and education program of employees in GCPI for cargo handling equipment operation, maintenance, and management of the container terminal operation 10) For port management, study and review the port tariff system, organizational establishment to introduce the port authority system and establishment of the operation company by GCPI
Development of Infrastructures	Restoration and rehabilitation of damaged facilities and cargo handling equipment at KZP Development of berthing facilities for public use at KZP Conducting efficient maintenance dredging of all the channels and port basin by establishing an adequate dredging strategy, and development of inland facilities like yard development and truck control system Procurement of the necessary cargo handling equipment and marine equipment Introduction of the EDI system in trade facilitation
Port Operation and Management Aspects	<ol style="list-style-type: none"> 1) Development of the training institute facilities and establishment of the training program 2) Training for capacity building, development of human resources for maintenance equipment, and port facility management on utility supply 3) Provision of the transparent tariff system

Source: JICA Study Team

6.2.2 URGENT AND SHORT- TO LONG-TERM DEVELOPMENT PLANS IN THE STUDY PORTS

(1) Proposed Development Scenario of the Major Ports

The urgent and short- to long-term development plans for the five major ports are listed in the following Table 6.2.

Table 6.2 Proposed Projects in the Urgent and Short- to Long-term Development Plans

Item	Umm Qasr Port	Khor Al Zubayr Port	Maqil Port and Abu Flus Port	Al Faw Port
Urgent 2007 -2015	Implementing and completing proposed urgent restoration projects of dredging works and removing wrecks in port and channel, Rehabilitation of equipment and port facilities, Restoration and recovery of the port function, Development of container terminal (11a&b).	Preparation of implementation program and arranging Japanese ODA loan for the following urgent restoration works: Dredging of port area and removal of wrecks in port area, Rehabilitation of equipment and damaged facilities, Development of a new berth for public use, and Restoration and recovery of port function.	Maintain as it is	Maintain as it is
2012 -2014	Conducting the study of the long-term development plan of national ports: i) Review the present function and identify the future function of each port; ii) Prepare the master plan for UQP and KZP; iii) Feasibility study of urgent and short-term development plans including port management by private participation; iv) Study maintenance dredging strategy for the channel; v) Master plan and feasibility study of the alternative port development in UQP and KZP in the southern region; vi) Study the function and restoration program of Maqil Port (Basra) and Abu Flus Port by dredging the channel and removing wrecks in the river; and vii) Conduct training and education of employees of GCPI for equipment operation, maintenance, and management of the container terminal operation, cargo handling equipment, pilot services, hydrographic survey.			
Short-term 2015-2020	Development of ro-ro ship berth with passenger terminal and car terminal at UQP, Development of container terminal by private operators, and Additional general cargo and bulk cargo berths.	i) Development of multipurpose berths; ii) Restoration of export berthing facilities for fertilizer; iii) Development of general cargo berthing facilities; iv) Procurement of cargo handling equipment; and v) Restoration of LPG terminal.	Restoration of the navigation channel including dredging works and removing wrecks, and Rehabilitation of the port facilities including equipment.	Development of a part of new Al Faw Port (western breakwater with staging platform).
Long-term After 2020	Additional berth development at both ports, especially container terminal and bulk cargo storage facility, as required by regional development and demands of transit cargo to neighboring countries. Procurement of additional cargo handling equipment, working vessels, dredgers, floating cranes, etc. at both ports.		Redevelopment of Maqil Port. Development of the channel of the Shatt Al Arab River by dredging and removal of wrecks.	Development of the new Al Faw port based on the proposed master plan study.

Source: JICA Study Team

(2) Short- to Long-term Development Plans for UQP and KZP

a. Development Scenario for UQP

The following components of expansion projects will be required as short- and long-term plans:

- Expansion of container terminal,
- Car terminal development,
- Conventional cargo and bulk terminal,
- Passenger and ro-ro terminal,
- Navigational channel improvement by deepening, widening and removal of wrecks,
- Expansion of on land facility and utility supply,
- Establishment of training institute and continuation of capacity building for GCPI employees, and
- Procurement of additional cargo handling equipment for container yards and ro-ro terminal and marine equipment for channel dredging and removal of wrecks.

b. Development Scenario for KZP

The restoration and rehabilitation works for the existing facilities at KZP are essentially required as an urgent project. These restoration works should be implemented as continuation of the current restoration projects under the Japanese ODA loan. The detailed scope of works and components of the proposed projects for the KZP are described in Chapter 11 and Chapter 12.

Subsequently, the following components of expansion projects will be required as short- and long-term plans after implementing the Port Sector Rehabilitation Project Phase II:

- Expansion of multi-purpose berths,
- Expansion of the conventional cargo handling area for cargo ships,
- Procurement of additional cargo handling equipment,
- Land facilities; utility supply; rehabilitation of power supply and new water supply plants for the port, and
- Rehabilitation of access road and railway behind the port to connect fertilizer plants and steel mill with the port facilities.

6.3. NEW AL-FAW PORT DEVELOPMENT PROJECT

Public-private partnership (PPP) scheme is being considered for the development of the new Al Faw Port. The Government of Iraq estimated that the project would more than recover its costs based on comparable ports elsewhere in the Gulf, and the total volume of Iraq cargo transported through Kuwait, Syrian, and Turkish ports. The Government of Iraq is planning to transform New Al Faw Port to an advanced and modern style port from its original 1970s design. It will be designed with the capacity to handle eighth generation container vessels (post 2006), which the current port facilities are unable to. UQP currently can take vessels up to about 12 m draft, but New Al Faw Port will be designed to take vessels of much deeper draft.

According to the master plan, the New Al Faw Port will be developed under a two-staged construction. At the final stage the port will have the following cargo handling capacity to meet the forecast cargo demand by the year 2038:

- Container cargo:	66 million tons
- Dry bulk cargo:	33 million tons
- Total cargo:	99 million tons.

The two-staged development will be implemented with the following major works;

(1) First stage development; container cargo 40 million tons (4 million TEU) and 22-25 million tons dry bulk

- Container berth (-17 m): 3,500 m
- Dry bulk berth (-17 m): 2,000 m
- Breakwater construction: Total 23.3 km
- Dredging volume (access channel and port basin): Approx. 154 million m³
- Reclamation volume: Approx. 47 million m³
- Land connection (road and railway)
- Buildings and utilities

(2) At the final stage, the port will have the following completed construction;

- Container berth (-17 m): 7,000 m
- Dry bulk berth (-17 m): 3,000 m
- Dredging volume: 241.7 million m³
- Reclamation volume: 61 million m³
- Land connection, buildings, and utilities

7. CONCEPTUAL PLAN OF PORTS DEVELOPMENT

7.1. GENERAL

In considering the future development plan of the ports of Iraq, the following two points listed below will be its main key factors;

- 1) Future cargo demand;
- 2) Implementation schedule of the new Al-Faw Port development and design capacity.

The realization of the new Al-Faw Port should decide the development plans of other existing ports. This would establish a viewpoint as to whether further investments (for expansion) to other existing ports should or should not be made. It will also depend on the time of completion and the consideration of future utilization of the existing ports after the new Al-Faw Port is completed.

7.1.1 REVIEW OF FUTURE CARGO DEMAND

From the results of the cargo demand forecast review conducted according to the updated cargo data, the future estimated cargo volume may have a possibility to remarkably increase. These are true especially for container cargoes and vehicles when compared with the previous cargo demand forecast made in the Study of Development of Southern Ports in Iraq Post Phase I Rehabilitation Projects (herewith referred to as Post-Phase I Development Plan) as shown in the following table.

Although the Data Collection Survey on Port Sector Development Plan in Iraq (herewith referred as the JICA Study) estimates may have a rather high growth case due to the scenario that the recovery of Iraqi economy continues, but not so far from the estimate of the new Al-Faw Port Master Plan.

It is therefore recommended that the future cargo demand to be used for future ports development plans should consider both estimates indicated in the Post Phase I Development Plan results as a lowest case and the JICA Study estimates as a higher possible case.

7.1.2 NEW AL-FAW PORT DEVELOPMENT PLAN

As described in Chapter 6, the New Al-Faw Port Master Plan has been completed and currently under review by GCPI. The master plan has been prepared following after its feasibility study with some modifications on its layout plan, but maintaining almost the same scale of the development as follows;

- (1) First Stage Development (sufficient until 2028-2030)**
 - Cargo handling capacity with container cargo of 40 million tons (4 million TEU) and dry bulk of 22-25 million tons.
- (2) Second Stage Development (sufficient until 2038)**
 - As the result, the port capacity is to have a container cargo of 66 million tons (7.5 million TEU) and dry bulk of 33 million tons.

The implementation program of the new Al-Faw Port at present is yet uncertain. However, it is expected that the first stage of construction will be completed between 2018 and 2025. This is in consideration of its importance and urgency as an earliest completion case and the financial restriction as a delayed implementation case (though GCPI expects and desires that the first stage of construction should be completed by 2018).

Since the new Al-Faw Port will, after its first stage completion, handle most forecast container cargo and dry bulk cargo, other ports should consider its roles, functions, and cargo handling shares after the new port realization.

7.2. BASIC CONCEPT FOR THE PORTS DEVELOPMENT

Considering the above mentioned situation and conditions, it is suggested that the following points should be regarded as a sort of pre-requisition in formulating future development plans for ports in Iraq;

- 1) The roles and functions of the existing ports after the new Al-Faw Port realization should be fully studied and established including the new port realistic implementation schedule.
- 2) Until the completion of the first stage of the new port, respective port development/improvement plans should be carefully studied to cope with the forecast cargo demand in a manner, for it to be cost effective and realistic, taking into account its future role and utilization.

Although there is no concrete policy on the future role and function of the existing ports, the New Al-Faw Port Master Plan (as conditions and consequence in the feasibility study) describes briefly the roles of the existing ports as follows;

- Umm Qasr Port: dedicated to international commercial traffic with its handling capacity of 10 to 11 MT/yr.
- Khor Al Zubayr Port: dedicated to local industrial traffic.
- Abu Flus Port and Maqil Port: dedicated to local commercial traffic, fed by cargo barges.

Further, the master plan recommends that no new terminals, except for on-going berth construction at Umm Qasr Port, be constructed and no investments for the improvement of Shatt El Arab are to be done.

Some points from the given recommendations above may be acceptable to GCPI as an economical way. It does not however describe how to cope with the increasing cargoes until the completion of the first construction stage of the new Al-Faw Port. The latest National Development Plan (2010-2014) shows the plans to rehabilitate and develop the existing main ports (UQP and KZP) at their utmost capacity. This may include additional berth construction, which might be a contradiction with the earliest development concept of the new Al-Faw Port.

Under such situation, it is strongly recommended to conduct a master plan study for different ports in Iraq. This is important in order to establish the roles of respective ports and the different study required functions, handling cargo types, and capacities until the new port starts its operation.

As a brief concept for future port development plans, the following subsection provides a preliminary recommendation for the roles of the existing ports.

7.3. PRELIMINARY CONCEPT FOR THE RESPECTIVE PORTS DEVELOPMENT PLAN

The following preliminary concepts for major ports development are recommended.

7.3.1 MAQIL PORT

From its geographical situation which is located at the center of Basra City, future development plans should focus on its harmonization with the city and its activities by maximizing the utilization of the adjacent water areas. This implies that the port should play an important role in the future for the beautification and modernization of the city of Basra, providing a useful and convenient waterfront areas

and facility for city activities. It is therefore recommended that the future port plans should have the following functions:

- Provide a useful and convenient water front area contributing to city development plans. These include water front parks, floating restaurants, floating hotels, and commercial shops/offices area;
- As a port function, passenger ferry terminals will be provided and strengthened as a main city gate for tourists; and
- Provide mariners and closing boats mooring/berthing facilities.

It is necessary that the Maqil Port functions as a commercial cargo port until the completion of the new Al-Faw Port. This is to assist in handling the increasing cargoes used by small cargo ships, dhows, or barges due to water depth restrictions and shipwrecks along the Shatt Al Arab River.

7.3.2 ABU FLUS PORT

Abu Flus Port is also located at the Shatt Al Arab River Bank, approximately 20 km downstream of Maqil Port. Until 2008, the port had not been functional due to damaged and deteriorated port facilities caused by the Iraq-Iran War. In 2009, a rehabilitation work financed by MOT has commenced in order to supplement the Maqil Port's function and operational handling of its main container cargo which is feeder transported from Dubai. Although further rehabilitation and expansion works are still ongoing, the handled container cargo at the port was around 35,000 boxes (50,000 TEU) in 2011. The berth structures are mainly pile supported steel deck type. Abu Flus Port has the same restrictions in ship size as Maqil Port due to its river's shallow water depth and other previous shipwrecks.

Under the above situation, the Abu Flus Port will continue to function as supplementary port of Maqil Port for container cargo handling until the completion of the new Al-Faw Port.

The long term plan or after completion of the new Al-Faw Port, the Abu Flus Port may function as a coast guard station. It can also function as a passenger boat or cruising ship station in collaboration with the Maqil Port or it can be leased out to private sectors for other commercial purposes.

The improvement and rehabilitation works of Shatt El Arab by removing the sedimentation at the river mouth and shipwrecked boats along the river should be considered for the effective utilization of both Maqil Port and Abu Flus Port.

7.3.3 UMM QASR PORT

Umm Qasr Port, being composed of the North Port and South Port will continue to perform its role and function as an international commercial port, regardless of the new Al-Faw Port construction. Until the completion of the new port, which will mainly handle container cargo and dry bulk cargo and be considered as the National Hub Port after construction, the Umm Qasr Port should play the primary role in coping with the sharply increasing cargoes, especially container cargoes, conventional cargoes, and vehicles. It is therefore necessary to continue its development according to the estimated cargo forecast after the ongoing rehabilitation project financed by Japan's ODA loan in an effective and economical manner. To this end, it is important to conduct an optimization study on the most cost-effective development plan considering the new port construction schedule and a realistic cargo demand.

According to the cargo demand forecast review results, 2.0 to 2.5 million TEU containers may be handled by 2020 (at expected early completion of the new port's first stage), if a high growth rate case is achieved. This implies that almost all of the current South Port must be converted into container terminals/berths.

As a consequence, no specialized terminal for vehicles will be possibly provided within the existing port area, which is also an urgent matter to meet the increasing volume. It is therefore suggested that the specialized terminal for vehicles be shifted to Khor Al Zubayr Port.

7.3.4 KHOR AL ZUBAYR PORT

Originally constructed as an industrial port, the Khor Al Zubayr Port is currently handling liquid bulk (oil refinery products) and break bulk cargoes. It also plays a supplementary function for the Umm Qasr Port in order to ease the increasing cargo handling. However, due to its shallow water depth at port basin, the calling vessels are relatively small, thus, inefficient cargo handling is being done by which a contribution in easing the cargo handling operation of Umm Qasr Port is low and less effective. To this end, it is necessary to carry out an urgent rehabilitation and improvement work for the Khor Al Zubayr Port in order to meet effectively and timely to a sharply, the increasing cargo demand.

The urgent rehabilitation and improvement plan should be made to cope with the expected cargo volume by the year 2015 as suggested by the Post-Phase I Study. Furthermore it should be able to provide a specialized terminal for vehicles under the reason described in Sub-chapter 7.3.3 above.

In the long-term plan, which is after the completion of the new port's first development stage, the Khor Al Zubayr Port will function as an industrial port, since several oil and gas based industries, steel mills, and other industrial productions are very prospective in and around the adjacent areas.

7.4. ENVIRONMENTAL CONSIDERATION

Upon implementing the planned project, environmental and social consideration for the project is required in the most of the countries based on the country's legal framework. The basic policy of the environmental and social consideration is to conserve 1) natural resources and 2) human life.

Table 7.1 summarizes the major laws in Iraq relating to environment.

Table 7.1 Summary of Major Laws Relating to Environment

Law name	Outline
Environmental Criteria for Industrial, Agricultural, and Public Service Projects, 1990 (Order number unknown)	Environmental criteria with respect to the location and environmental requirements on industrial, agricultural and public service development.
Law Concerning Ports, 1995 (No. 27 of 1995).	This law regulates navigation and port safety, the prevention of water pollution, the operation of importation and exportation agents, and the registration of ships.
Regulation 25 Preservation of Rivers and Public Water from Contamination, 1967	This regulation relates to the protection of rivers and public water bodies from contamination. The concentration standard for the discharge of wastewater into public water bodies is also regulated.
Wastewater Discharge Quality Requirements Instruction No.(1)	This instruction provides discharge concentration limits for a number of substances contained in wastewater, in accordance with the provisions of Article (16) of Regulation 25.
The New Determinants for the Prevention of Pollution of Rivers No. (25), 1967	This instruction provides physical, chemical and biological guidelines for water quality and wastewater discharges.
Ambient Air Quality Law	This law aims to control emissions to air from a variety of sources (including industrial (factories, power stations, incinerators, oil installations, etc.), non - industrial, and vehicles). It establishes emissions limits for the discharge of certain pollutants to air.
Noise Prevention Law No. (21), 1966	These regulation aims to prevent excessive noise in public places.
Instructions No. (2), 1993	This instruction details the conditions for determining the levels of noise emitted from sound equipment in tourist facilities.
Instructions No. 4, Safe Storage and Handling of Chemicals, 1989	This instruction details the requirements for the safe storage and handling of chemicals, being issued in accordance to the provisions of the sixth and seventh paragraph of Article (3) and Article (105) of the Public Health Law No. 89, 1989.
Iraqi Salvage Law	It focuses on the issue of physical wreck removal.
Law No. 27, 2009	Law for protection and improvement of the environment. This law is replaced version of Law No.3, 1997 for Environment Protection and Improvement. And it aims to protect and improve the environment and natural resources, preserve public health, biodiversity and cultural and natural heritage, to ensure sustainable development and international and regional cooperation in this area.

Source: JICA Study Team

Law No. 27, 2009 shown above requires development projects to obtain an Environmental Compliance Certificate. In order to obtain such a certificate a pre-project environmental evaluation must be conducted so that protection systems are incorporated.

JICA also has a guideline for environmental and social consideration and this guideline is also applied on the JICA project as well as the guideline/laws of the target country.

In this project, former guideline¹ by JBIC (JBIC: Japan Bank for International Cooperation) is supposed to be applied.

According to the JBIC guideline, following principles shall be taken into consideration:

- A wide range of impacts must be addressed.
- Measures for environmental and social considerations must be implemented from an early stage to a monitoring stage.
- JICA is responsible for accountability when implementing cooperation projects.
- JICA asks stakeholders for their participation.
- JICA discloses information.
- JICA enhances organizational capacity.

¹ JBIC Guideline for Environmental and Social Consideration, April 2002, JBIC

- JICA makes serious attempts at promptness.

If any laws and guidelines described above do not cover the items of the planned project or no applicable guidelines/laws exist, the environmental policies by the World Bank are referred.

Detailed environmental procedure is discussed in Chapter 14.

8. PRESENT SITUATION ON PORT MANAGEMENT & OPERATION

8.1. PRESENT SITUATION

8.1.1 ORGANIZATION AND STAFFS

Founded in 1997, the General Company for Port of Iraq (GCPI) has been administrating and running the ports in Iraq under the Companies Law No. 22. GCPI's organization and staffs are indicated in the Table 8.1 and Figure 8.1. The total number of employees are at 10, 208 in 2010, and decreased to 8,047 in 2012.

Table 8.1 GCPI Personnel (2012) by Departments

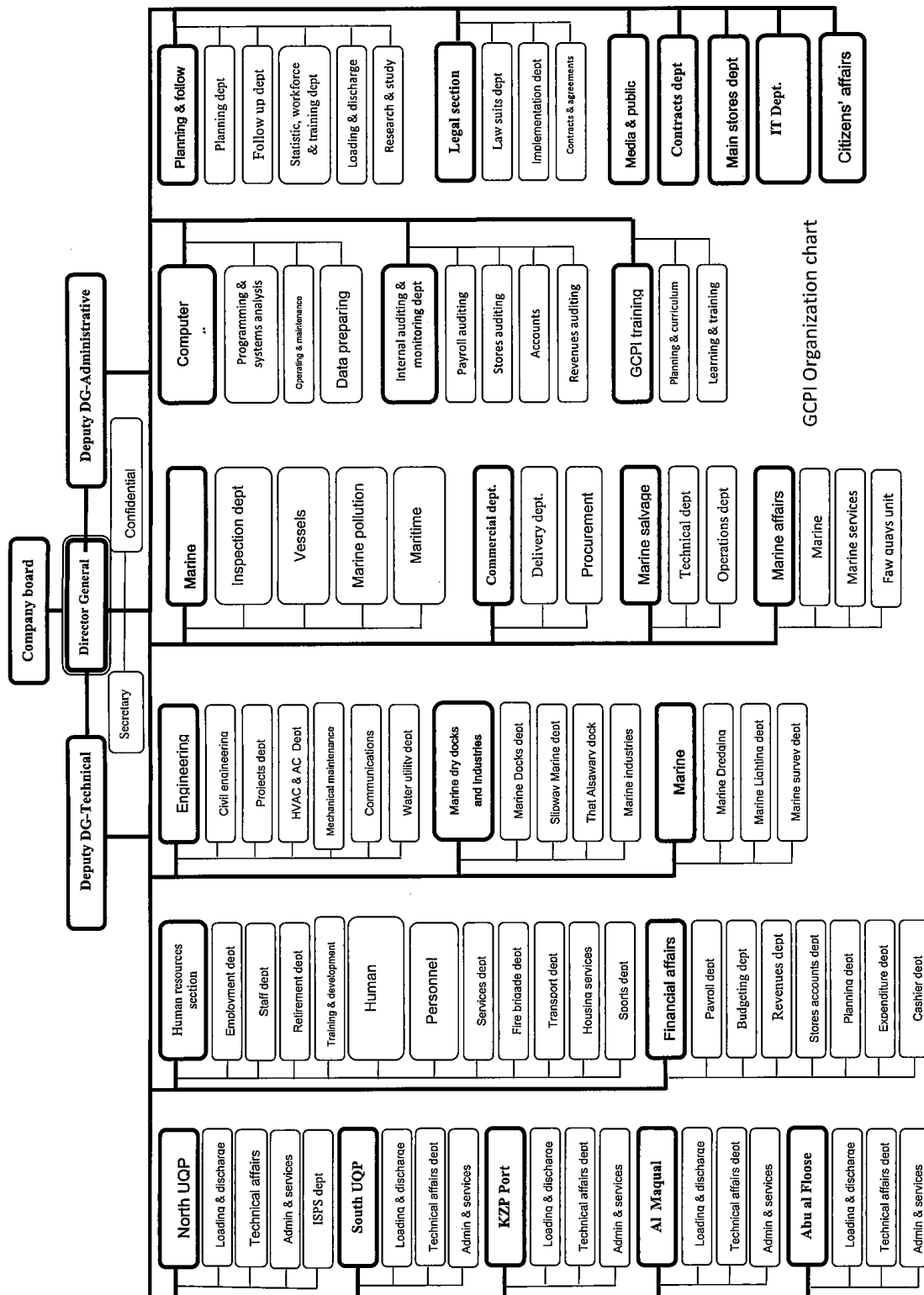
No.	GCPI Sections	Number	No.	GCPI Sections	Number
1	Top Executives	10	13	Marine(Inspection)	215
2	Secretary	7	14	Commercial	44
3	North UQP	1,234	15	Marine Salvage	281
4	South UQP	750	16	Marine Affairs(service)	902
5	KZP	605	17	Computer	98
6	AL Maq.	886	18	Internal Auditing	65
7	Abu Flo.	353	19	GCPI training	96
8	Human Resources	813	20	Planning and Follow	71
9	Financial Affairs	128	21	Legal Section	49
10	Engineering	128	22	Media and Public	123
11	Marine Dry Docks and Industries	717	23	Contracts	34
12	Marine(Dredging)	551	24	IT Dept.	15
A	Sub Total(1-12)	6,054	B	Sub Total(13-24)	1,993
	Grand Total (A+B)	8,047			

Source: GCPI

8.1.2 MAJOR ACTIVITIES AND FUNCTIONS

The major activities and functions of the ports of Iraq are as follows.

- Loading and unloading of various exports and imports from/to Iraq through the different ports.
- Berthing operations at the ports of Iraq.
- Signaling to navigating ships in Iraqi territorial waters.
- Carry out investigation and survey, deepening of channel, and furnishing lightings for navigation aids.
- Implementation of projects for the development of ports.
- Acts of dry-docking, maintenance and repair of domestic and foreign ships.
- Provision of services for ships and offshore units. Salvage and rescue work in territorial waters.
- Communications services, housing and other public services.
- Maintenance of the equipment, machinery, vehicles, water and electricity.
- Training and rehabilitation of core personnel for all disciplines and professions and marine unloading and shipping.

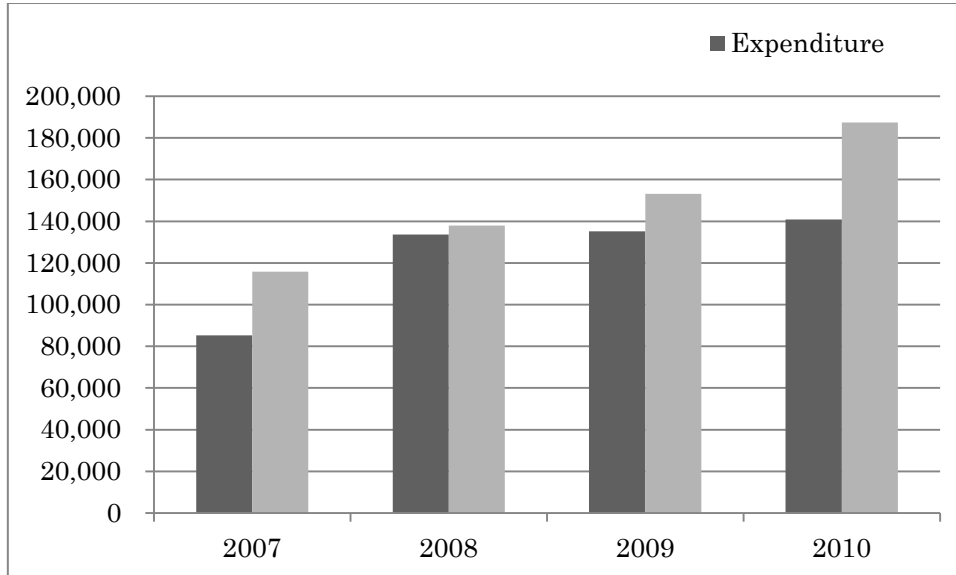


GCPI Organization chart

Figure 8.1 GCPI Organization Chart

8.1.3 REVENUE AND EXPENDITURE

The revenue and expenditure of GCPI period from 2008 to 2010 is summarized in Figure 8.2. The revenue increased through 2008-2010, while the expenditure remained the same. The revenue has been exceeding the expenditure in recent years.



Source: GCPI

Figure 8.2 Revenue and Expenditure of GCPI (million dinar)

8.2. ISSUES ON PORT MANAGEMENT AND OPERATION

8.2.1 CONDITIONS OF PORT EQUIPMENT

GCPI has owned many of over 30 years old cargo handling equipment and marine equipment. Accordingly, most of the quay side cranes, service boats, other than some tug boats and one survey boat, are either not-working or already aged and required to be replaced as shown in Table 8.2 to Table 8.7. This situation is a most critical issue on port operation.

(1) Cargo Handling Equipment in UQP

Table 8.2 Cargo Handling Equipment Owned by GCPI (Quayside cranes at UQP South)

No.	Name	Origin	SWL	Quay No.	Condition	Year Installed	Operating Hours
1	Sumitomo	Japan	5	2	working	n/a	n/a
2	Sumitomo	Japan	5	2	working	n/a	n/a
3	Sumitomo	Japan	8	2	working	n/a	n/a
4	SPMP	China	15	6	working	1980	n/a
5	SPMP	China	8	6	not working	1980	n/a
6	SPMP	China	8	7	working	1980	n/a
7	SPMP	China	5	7	working	1980	n/a
8	SPMP	China	15	7	working	1980	n/a
9	Sumitomo	Japan	8	8	not working	n/a	n/a
10	Sumitomo	Japan	8	8	not working	n/a	n/a
11	SPMP	China	8	8	working	1980	n/a
12	SPMP	China	8	8	working	1980	n/a
13	SPMP	China	5	8	working	1980	n/a
14	SPMP	China	15	8	not working	1980	n/a
15	SPMP	China	8	8	not working	1980	n/a

Source: JICA Study Team

Table 8.3 Cargo Handling Equipment Owned by GCPI (Quayside cranes at UQP North)

No.	Name	Origin	SWL	Quay No.	Condition	Year Installed	Operating Hours
1	Takraf	Germany	15	12	working	1980	n/a
2	Takraf	Germany	3	12	working	1980	n/a
3	Takraf	Germany	8	13	working	1980	n/a
4	Takraf	Germany	3	14	working	1980	n/a
5	Takraf	Germany	8	14	not working	1980	n/a
6	Takraf	Germany	8	14	not working	1980	n/a
7	Takraf	Germany	3	8	not working	1980	n/a
8	Takraf	Germany	15	14	not working	1980	n/a
9	SPMP	China	8	15	not working	1980	n/a
10	SPMP	China	15	16	not working	1980	n/a
11	Takraf	Germany	3	16	not working	1980	n/a
12	Takraf	Germany	3	16	not working	1980	n/a
13	Takraf	Germany	3	16	not working	1980	n/a
14	Takraf	Germany	15	16	not working	1980	n/a
15	Takraf	Germany	3	17	not working	1980	n/a
16	Takraf	Germany	3	17	working	1980	n/a
17	Takraf	Germany	15	17	not working	1980	n/a
18	Takraf	Germany	3	17	not working	1980	n/a
19	Takraf	Germany	8	18	working	1980	n/a
20	Takraf	Germany	3	18	not working	1980	n/a
21	Takraf	Germany	5	18	not working	1980	n/a
22	Takraf	Germany	3	18	working	1980	n/a
23	Takraf	Germany	3	18	not working	1980	n/a
24	Takraf	Germany	3	18	not working	1980	n/a
25	Takraf	Germany	15	18	not working	1980	n/a
26	Takraf	Germany	8	18	not working	1980	n/a
27	Takraf	Germany	8	18	not working	1980	n/a
28	Takraf	Germany	3	18	not working	1980	n/a
29	Takraf	Germany	15	18	not working	1980	n/a
30	Takraf	Germany	3	18	not working	1980	n/a
31	Takraf	Germany	8	19	not working	1980	n/a
32	Takraf	Germany	3	19	working	1980	n/a
33	Takraf	Germany	15	19	working	1980	n/a
34	Takraf	Germany	8	19	working	1980	n/a
35	Takraf	Germany	15	19	working	1980	n/a
36	ZPMC	China	40	20	working	1997	n/a
37	ZPMC	China	40	20	working	1997	n/a
38	Liebherr	Germany	104	19 and 20	working	2004	n/a
39	Liebherr	Germany	104	19 and 20	working	2004	n/a
40	Takraf	Germany	8	19	working	1980	n/a

Note: Two G/Cs recently arrived for installation at quay nos. 11a & 11b.

Source: JICA Study Team

(2) Cargo Handling Equipment in KZP

Table 8.4 On-land Machinery and Equipment (KZP) (1)

Item	No. on Berth	Capacity	Specification	Purchase Year	Working Area (Berth No)	Condition in 2005			Condition in 2011		
						General Condition	Date of Problem	Restoration Method	General Condition	Date of Problem	Restoration Method
Sho to crane (Le will hoisting per rtd) (Sh crane)	1	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	2	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	3	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Out of Order	Need Elec. & Mechanical Spare Parts	Repairing			
Sho to crane (Le will hoisting per rtd) (Sh crane)	4	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Out of Order	Need Elec. & Mechanical Spare Parts	Repairing			
Sho to crane (Le will hoisting per rtd) (Sh crane)	5	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	6	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	7	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	8	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	9	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Out of Order	Need Elec. & Mechanical Spare Parts	Rehabilitation			
Sho to crane (Le will hoisting per rtd) (Sh crane)	10	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Out of Order	Need Elec. & Mechanical Spare Parts	Rehabilitation			
Sho to crane (Le will hoisting per rtd) (Sh crane)	11	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	12	8 Ton	30RMIT OMC0 Made in Japan	1979	2, 3, 4	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	13	5 Ton	TACKANIT Made in Germany	1983	7, 8	Out of Order (Under Repairing)	Need Elec. & Mechanical Spare Parts	Repairing			
Sho to crane (Le will hoisting per rtd) (Sh crane)	14	15 Ton	30RMIT OMC0 Made in Japan	1979	7, 8	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	15	4 Ton	30RMIT OMC0 Made in Japan	1979	7, 8	Working					
Sho to crane (Le will hoisting per rtd) (Sh crane)	16	10 Ton	30RMIT OMC0 Made in Japan	1979	7, 8	Out of Order	Need Elec. & Mechanical Spare Parts	Rehabilitation			
Sho to crane (Le will hoisting per rtd) (Sh crane)	17	10 Ton	30RMIT OMC0 Made in Japan	1979	7, 8	Out of Order	Need Elec. & Mechanical Spare Parts	Rehabilitation			
Sho to crane (Le will hoisting per rtd) (Sh crane)	18	4 Ton	30RMIT OMC0 Made in Japan	1979	7, 8	Out of Order	Need Elec. & Mechanical Spare Parts	Repairing			
Sho to crane (Le will hoisting per rtd) (Sh crane)	19	15 Ton	30RMIT OMC0 Made in Japan	1979	7, 8	Out of Order	Need Elec. & Mechanical Spare Parts	Repairing			
Sho to crane (Le will hoisting per rtd) (Sh crane)	20	5 Ton	TACKANIT Made in Germany	1983	7, 8	Out of Order	Need Elec. & Mechanical Spare Parts	Repairing			
Forklift		3 Ton	HELL Made in C hna	2001	Khor Az Zmbayz B.r	Working			Working		
Forklift		10 Ton	HELL Made in C hna	2001	Khor Az Zmbayz B.r	Working			Working		
Forklift		10 Ton	HELL Made in C hna	2001	Khor Az Zmbayz B.r	Working			Working		
Forklift		3 Ton	Jonser Made in India	2001	Khor Az Zmbayz B.r	Working			Working		
Forklift		7 Ton	Jonser Made in India	2001	Khor Az Zmbayz B.r	Out of Work	Need Spare Parts	Repairing	Working		
Forklift		7 Ton	TCM Made in Japan	1984	Khor Az Zmbayz B.r	Working			Working		
Forklift		24 Ton	TOYOTA Made in Japan	1980	Khor Az Zmbayz B.r	Out of Work	Need Spare Parts	Repairing	out of work	expuse model	
RTG		40 Ton	FRAT UZZI Made in Italy	2004	Khor Az Zmbayz B.r	Working			Working		
RTG		40 Ton	FRAT UZZI Made in Italy	2004	Khor Az Zmbayz B.r	Working			Working	Insider to wip	
Flat Trailer		35 Ton	MAN Made in Germany	1980	Khor Az Zmbayz B.r	Working			Working	out of work	expuse model
Tractor		2 Ton	BEARCAT Made in Pakistan	1998	Khor Az Zmbayz B.r	Working			Working		
Slip Loader		1300 Ton/over	Made in Branch	1981	Berth no. 11	Out of Order	Unknown		Out of Order		
Slip Loader		1300 Ton/over	Made in Branch	1981	Berth no. 11	Out of Order	Unknown		Out of Order		
Slip Loader		1300 Ton/over	Made in Branch	1981	Berth no. 11	Out of Order	Unknown		Out of Order		
Slip Loader		800 Ton/over	30RMIT OMC0 Made in Japan	1980	Berth no. 3, 4 & 7	Out of Order	Unknown		Out of Order		

Table 8.5 On-land Machinery and Equipment (KZP) (2)

Item	No. of Berths	Capacity	Specification	Purchase Year	Work ing Area (Berth No.)	Cond Em in 2005		Cond Em in 2011	
						General Condition	Extent of Problem	General Condition	Extent of Problem
Ship Lander	2	100 Tons	30MTOMO Made in Japan	1980	Berth no 3, 4 & 87	Out of Order	Out of Order	Out of Order	Out of Order
Ship Lander	3	100 Tons	30MTOMO Made in Japan	1980	Berth no 3, 4 & 87	Out of Order	Out of Order	Out of Order	Out of Order
Ship Lander	4	100 Tons	30MTOMO Made in Japan	1980	Berth no 3, 4 & 87	Out of Order	Out of Order	Out of Order	Out of Order
Stacker		300 Tons	Made in France	1980	Khor Az Zubayr	Out of Order	Out of Order	Out of Order	Out of Order
Stacker		430 Tons	30MTOMO Made in Japan	1980	Khor Az Zubayr	Out of Order	Out of Order	Out of Order	Out of Order
Water Tanker		22000 L	VOLVO Made in Sweden	1980	Khor Az Zubayr	Working	Working	Out of Order	excess model
Water Tanker		22000 L	VOLVO Made in Sweden	1980	Khor Az Zubayr	Out of Order	Out of Order	Out of Order	excess model
Fire Fighting Vehicle	5.5 Ton	Water Ton 16	Monsieur AC TRCS	2002	Khor Az Zubayr	Working	Working	Working	Working
Fire Fighting Vehicle			FAW Made in China	2001	Khor Az Zubayr	Out of Order	Road Spare Part	Out of Order	need spare parts
Electronic Bridge Sank		100 Ton	Made in Japan and supplied with new equipment from japan made after the war	1980	Khor Az Zubayr	Working		Working	
Electronic Bridge Sank		100 Ton	Made in Japan and supplied with new equipment from japan made after the war	1980	Khor Az Zubayr	Working		Working	
Electric Generator		250 KVA	CATERPILLER Made in UK	2003	Khor Az Zubayr	Working		Working	
Electric Generator		250 KVA	CATERPILLER Made in UK	2003	Khor Az Zubayr	Working		Working	
Electric Generator		250 KVA	CATERPILLER Made in UK	2003	Khor Az Zubayr	Out of Work	Road Spare Parts	Working	
Electric Generator		300 KVA	MITSUBISHI Made in Japan	1980	Khor Az Zubayr	Working		Working	
Electric Generator		430 KVA	MITSUBISHI Made in Japan	1979	Khor Az Zubayr	Working		Working	
Electric Generator		250 KVA	TATYCO		Khor Az Zubayr	Out of Work		Out of Work	
Electric Generator		125 KVA	PERKING		Khor Az Zubayr	Working		Working	
Electric Generator		175 KVA	MITSUBISHI Made in Japan	1980	Khor Az Zubayr	Working		Working	
Electric Generator		43 KVA	DEHYO		Khor Az Zubayr	Out of Work		Out of Work	
Electric Generator		1000Kv	working	2009	Khor Az Zubayr	Working		Working	
Molok Crane		20 Ton	TADANO Made in Japan	1980	Khor Az Zubayr	Working		Out of Work	Expand Model
Molok Crane		15 Ton	TADANO Made in Japan	1980	Khor Az Zubayr	Out of Work	Unknown	Out of Work	Expand Model
Molok Crane		15 Ton	TADANO Made in Japan	1980	Khor Az Zubayr	Out of Work	Unknown	Out of Work	Expand Model
Molok Crane		15 Ton	TADANO Made in Japan	1979	Khor Az Zubayr	Out of Work	Unknown	Out of Work	Expand Model
Molok Crane		10 Ton	TADANO Made in Japan	1979	Khor Az Zubayr	Out of Work	Unknown	Out of Work	Expand Model
Molok Crane		4 Ton	COLISE Made in England	1982	Khor Az Zubayr	Working	Road New Battery	Out of Work	Expand Model
Molok Crane		4 Ton	COLISE Made in England	1982	Khor Az Zubayr	Working	Road New Battery	Out of Work	Expand Model
Molok Crane		4 Ton	COLISE Made in England	1982	Khor Az Zubayr	Working	Road New Battery	Out of Work	Expand Model
Molok Crane		4 Ton	COLISE Made in England	1982	Khor Az Zubayr	Working	Road New Battery	Out of Work	Expand Model

(3) Marine Equipment Owned by GCPI

Table 8.6 Marine Equipment of GCPI

Item	Name	Type	Capacity	Specifications	Purchase Year	Condition in 2005 (General Condition)
Tug Boat	Mhejran		4,500 HP	Made in Japan	1975	Out of order
	Albatoul		3,500 HP	Made in Malaysia	2000	Working
	Alshaimaa		3,600 HP	Made in Malaysia	2000	Working
	Aljamhuria		2,500 HP	Made in Japan	1976	Working as guides station
	Umarah		2,500 HP	Made in Japan	1976	Out of order (Under repair in the maintenance workshop in Almaagal)
	Alraia		4,200HP	Made in China	1999	Working
	Ibn Batutah		4,200 HP	Made in China	1999	Working
	Alyarmook		4,200 HP	Made in China	1999	Out of order (Issued for tender for repair)
	Alfatih Almubeen		4,200 HP	Made in China	1999	Out of order (Issued for tender for repair)
	Alurobah		2,500 HP	Made in Japan	1976	Out of order (Under repair in the maintenance workshop in Almaagal)
	Alwihdah		2,500 HP	Made in Holland	1980	Out of order (under repair in Umm Qasr)
Other Vessels	Alnissier	Buoy Boat		Made in Germany	1980	Now under maintenance in Kuwait
	Al shurok	Pilot Boat		Made in Japan	1976	Out of order and need maintenance
	Alfao	Survey Boat	280 HP	Made in Italy L: 42.5 m x W: 7.42 m x H: 2 m	1968	Out of order
	Abarakkah	Survey Boat	700 HP	Made in Denmark L: 22.25 m x W: 15.5 m x H: 2.25 m	2001	Working with one engine
	Alkhayr	Work Boat		Made in Japan	1976	Working in Umm Qasr
	No. 201	Mooring Boat		Made in Malaysia	1976	Need complete maintenance
	No. 304	Mooring Boat		Made in Malaysia	1976	Need complete maintenance
	No. 303	Mooring Boat		Made in Malaysia		Need complete maintenance
	No. 305	Mooring Boat				Wrecked in Umm Qasr
	No. 472	Mooring Boat				Wrecked in Umm Qasr
	No. 203	Mooring Boat		Made in Malaysia		Need complete maintenance
	No. 314	Mooring Boat		Made in Holland	1976	Not working
	No. 342	Moring Boat				Not working and now in maintenance workshop
	No. 386	Mooring Boat				Not working
	No. 338	Passenger Boat		Made in Malaysia	1976	Not working
	No. 318	Mooring Boat				Not working and now in maintenance workshop
	No. 339	Mooring Boat		Made in China		Not working
	No. 340	Mooring Boat		Made in China		Not working and now in maintenance workshop
	No. 316	Mooring Boat		Made in Holland		Not working and now in maintenance workshop
	No. 307	Mooring Boat		Made in Holland	1976	Working percentage is 80% in Umm Qasr
	No. 317	Mooring Boat		Made in Holland	1976	Not working
	No. 312	Mooring Boat		Made in Holland	1976	Not working and now in maintenance workshop
	No. 315	Mooring Boat		Made in Holland	1976	Not working and now in maintenance workshop
No. 308	Mooring Boat		Made in Holland	1976	Not working	
No. 341	Mooring Boat		Made in China	1999	Need complete maintenance	
No. 329	Mooring Boat				Not working	
Barge No. 1	Tanker			Made in Germany	1980	Need complete maintenance
Barge No. 2	Tanker			Made in Germany	1980	Not working
Floating Cranes	Himreen		100 tons	Made in Germany L: 22 m x W: 22 m x H: 3.5 m	1976	Working percentage is 75% and requires maintenance
	Sanam		100 tons	Made in Germany L: 22 m x W: 22 m x H: 3.5 m	1976	Not working and all parts were looted
	Khalid ibn al-waleed		350 tons	Made in Spain L: 63 m x W: 31 m x H: 6.5 m	1975	Not working and all parts were looted
	Almusrafa					Not working and wrecked in Basra

(4) Dredgers Owned by GCPI

Table 8.7 List and Conditions of Dredgers as of March 2012

No.	Type	Description	Name			Current Condition
1.	TSHD	Al Zubayr	3,000 m ³	1975	IHC	Under repair
2.	TSHD	Al Tahreer	3,000 m ³	1977	IHC	Under repair
3.	TSHD	Teeba	3,500 m ³	2006	China	Working (but need rehabilitation)
4.	TSHD	Al Marbd	2,000 m ³	1993	Germany	Not working (Repair needed)
5.	TSHD	Al Basrah	3,000 m ³	1975	IHC	Under repair
6.	CSD	Saif Al Khar	3,000 m ³	1980	Japan	Not working
7.	CSD	Nasnya	750 m ³	1999	France	Working
8.	CSD	Ram Allah	1,500 m ³	1999	Vietnam	Not working (Repair needed)

Source: GCPI

8.2.2 ISSUES ON PORT OPERATION

According to the findings of the Study, the following points are the main issues on the port operation, in addition to the known physical issues such as damages of port facilities and obstructions in the access channels (shipwrecks and sedimentation);

- 1) Inefficiency of cargo handling and other port service caused from shortage of cargo handling equipment and marine equipment.
- 2) Lack of timely repairs and maintenance of Port equipment due to shortage of spare parts.
- 3) Prolonged stay of vessels at berths, due to time consuming process in the custom clearance.
- 4) Inappropriate arrangement of port facilities and yards including the maintenance and repairs.
- 5) Delays in introduction of effective operation systems, especially in computerization, yard management & operation system, etc.
- 6) Shortage of experienced persons for the works in the port management and operation aspects.

The Items 1) and 2) above may also be caused from the following institutional issues, rather than the budget insufficiency or technical issues in the procurement of equipment and materials;

- Due to the limited authorization in expenditure of Director General or Heads of Divisions and Departments respectively, which is deemed so little amount from the practical view point, most of the purchase requests need to go to MOT in Baghdad.
- Further, its approval procedure also requires to go through Divisions and Sections of both GCPI and MOT with many documents, consequently this has causing a considerable delays till the site receives the requested material, and worsened if formal tenders are required as exceeding a limit.

As to Item 3), the main cause of the issue is understood to be a lack of adequate information sharing/communication system and restricted working hours. However, a lack of necessary facilities near by the Port may also be a major cause, as the testing and inspection of foods and crops imported can only be done in Baghdad by sending samples, thus causing further time wasting.

As the consequent of the inefficient port operation caused from the abovementioned issues, a shortage of berths in the ports is also anticipated, especially in KZP is a critical case.

9. IMPROVEMENT PLAN ON PORT MANAGEMENT & OPERATION

9.1. IMPROVEMENT PLAN

According to the annual report in 2010, GCPI reported the faced issues and the corresponded measures as shown in Table 9.1.

Table 9.1 Issues and Response Related to the Activities of GCPI

No.	Obstacles and Problems	Solutions and Proposals
1	The lack of equipment to cope with the need for continuous dredging	<ul style="list-style-type: none"> - Constraints removal- continuous dredging, especially in the channel to Umm Qasr) in order to maintain design depth; - Implementation of offshore dredging project using Japanese loan; Jan De Nur, (Belgium), carried out Dredging work of 5.15 million m³ at UQP to maintain the design water depth at -12.5m - Purchase of a dredger with a capacity of 2500 m³; - Tender approval of dredger with a capacity of 2500 m³; - Dredger will be provided by Gulfainer contracted to invest on the quay construction project in Umm Qasr; and - Dredgers will be provided by Japanese aid.
2	Shipwrecks in waterways affecting the entry and exit of vessels coming into Iraqi ports	<ul style="list-style-type: none"> - There are action plans by the Department of Maritime Rescue to lift and work continuously for this purpose; - Lift project has four objectives under the Japanese loan; and - Approached to the province of Basra for the purpose of buying cranes with capacity of 1500 tons and 1000 tons.
3	The lack of equipment, i.e., dredgers, tractors, forklifts, marine vessels, boats, and lighting vessels, makes the port equipment specialist for handling and communications difficult	<ul style="list-style-type: none"> - Purchase a number of equipment and machinery within the investment plan as well as the worn-out offshore units and equipment for the shipyards. However, the allocations are not enough to purchase such equipment.
4	Delayed funding for projects	<ul style="list-style-type: none"> - Accelerate financing.
5	The presence of a large water obstacle floating on the Shatt al-Arab, shipwrecks and sedimentation restricts navigation	<ul style="list-style-type: none"> - Required to instruct the province of Basra to coordinate with the ports to open the bridge daily and determine the time which do not affect the operations of transit on the bridge; - Identify a dedicated staff to be informed of the vessels coming in and out; and - Increase the lighting in that area.
6	Accumulation of goods in ports, particularly in the ports of Umm Qasr and Khor Al Zubayr	<ul style="list-style-type: none"> - Direct the implementation of the customs law of public auction sale after 90 days and the arrival of goods in the port; - Instruct the state departments to receive the containers; - The allocation site for the Directorate of Customs is outside the port to lift the container and goods.
7	Unscheduled vessels coming to the ports to create to reduce waiting time by the Ministry of Commerce	<ul style="list-style-type: none"> - The Ministry of Trade State Company for foodstuff trading ports notifies the agenda including the arrival of ships to avoid congestion in the waiting ships.
8	Delayed laboratory testing of goods supplied to the ports	<ul style="list-style-type: none"> - It is necessary to build testing laboratories in the province of Basra close to the ports to avoid delays in inspections and to allocate staff by the Ministry of Health and Commerce in each port to speed up inspections.
9	Damaged goods cannot be destroyed until various time-consuming procedures are followed	<ul style="list-style-type: none"> - Custom requires the formation of special committees for the destruction of damaged goods as well as necessary equipment, staff and -the involvement of stakeholders and a representative of the ports to ensure that damaged materials are not leaked to local markets.
10	Lack of sonar equipment to scan cargo and containers	<ul style="list-style-type: none"> - The examination of sonar devices belonging to the Ministry of Finance/Customs, is currently available in all ports. However, currently only one device is available, which was not available three years ago and Minister of Finance was to provide two, although this has not yet done. - Declaration of a joint operation to provide sonar devices by our company.
11	Delay in opening of documentary credits for foreign bids	<ul style="list-style-type: none"> - To instruct the Trade Bank of Iraq TBI to rapidly open credits and determine the timeframe.
12	Overruns on buildings and port facilities	<ul style="list-style-type: none"> - To instruct the security authorities in the province for the purpose to aware raising abuses.
13	The presence of cars reserved in the port of Abu Flus has not been resolved despite continued assurance to solve by the customs	<ul style="list-style-type: none"> - Emphasis the parties concerned to resolve the lift car reserved for a long time by a simplified and quicker procedure.

Source: JICA Study Team

Considering the above situation, the JICA Study Team recognizes that the GCPI has the following important tasks:

- Rehabilitation of the facilities that were destroyed during the war, i.e., channel, navigation aids, quays, quay cranes, and dredgers;
- Strengthen the function of basic facilities, e.g., channel, navigation aids, quays, quay cranes, roads and pavements;
- Procurement of large cargo handling machines and maintenance/repair, e.g., RTG, top lifter, forklifts; and
- Utilization of IT, e.g., work planning, recording, and display of address of container stacking, record of gate in/out, loading/unloading, and data linking to tariff calculation, progress of works, displaying of waiting queues, and instructions to the drivers on where to go.

Future needs:

- Port development to meet future cargo demand; and
- Promotion of concession.

Maintenance and repair of facilities is extremely important to prevent work stoppage. To realize a reliable maintenance system, the following measures need to be undertaken:

- Provision of maintenance facilities;
- Establishment of a maintenance system including manpower and education; and
- Securing the supply of parts, and procurement efficiency.

Based on the above, the following issues need to be addressed:

- Priority of solutions; and
- Setting the organization's target and formulation of its action plan.

Areas to be improved include the following:

- Safety of navigation;
- Improvement of cargo handling productivity and quality of service improvement in the transfer of information; and
- Improvement of document processing.

10. CAPACITY BUILDING PLAN

10.1. GENERAL

As described in the previous chapters, the ports of Iraq has been facing with considerable issues related to the port management & operation, by which rehabilitation/ reinforcing of the port facilities, replacement / improvement of port equipments (cargo handling and marine equipment), introduction of modern operation systems are essentially and urgently required in order to improve such situations and achieve better productivities, as well as the improvement and upgrading of the concerned organizational and personnel capabilities.

To this end, it is essential to formulate a necessary capacity building plan and arrange/assist in its implementation.

Further, it will also be unavoidable to respond to the following aspects and issues in order for the ports in Iraq to be an internationally recognized modern port;

- ISPS Code compliant (in navigation safety, prevention of marine pollution, etc.);
- Due consideration on Environmental Protection;
- Enhancement on Safe Operation and Sanitation;
- Provisions of satisfactory and quick port-related business services (satisfying Port users needs and competitiveness)

Since the above matters will be surely beyond the capacity of section managers and persons in charge, it is necessary to cope with the issues as whole GCPI matters and even involving Ministries concerned, and therefore mostly time consuming.

From the above, it will be important and necessary, in formulating a Capacity Building Plan, to divide the target themes into categories according to the magnitude of importance in responding the issues and solutions, such as matters related to institutional and organizational issues, subjected to managers aspects, or just related to persons in charge, from which a precise and effective plan will possibly be made.

The following table summarizes, using the findings of the Study, a preliminary categorization of the Issues and Target outputs according to the responding levels of the organization.

Table 10.1 Categorization of Issues and Target Outputs

Responding Level	Issues to be solved/improved	Outputs
A. GCPI Administration , Ministries concerned	<ol style="list-style-type: none"> 1. GCPI's Budget & Financial issues 2. ISPS compliance 3. GCPI's organizational issues 4. PPP implementation policy and procedures 	<ul style="list-style-type: none"> - Establishment of GCPI's clear authorization and responsibilities on financial aspects. - Basic policies for the compliance to International organizations and requirements. - Prompt decision making. - PPP strategy and regulations.
B. GCPI Management and Key persons	<ol style="list-style-type: none"> 1. Introduction and operation of efficient operation systems 2. Computerization (IT system) 3. Improvement of procurement method of projects and equipment 4. Environment and Safety control improvement 5. Institutional set up on capacity building including such facilities. 	<ul style="list-style-type: none"> - Improved methods/ procedures of efficient port operations. - Set-up of clear and firm roles/ responsibilities and Improved communication in the organization. - Ability & knowledge improvement of responsible persons of sections. - Improvement in conducting Port development plans and equipment procurement. - Improved control procedures for port facilities and equipment maintenance and repair. - Environment protection and safety control procedures.
C. Sections chiefs, Persons in charge and Operation staff	<ol style="list-style-type: none"> 1. Capacity improvement of sections and individuals. 2. Improvement of ability on maintenance and repairs of facilities and equipment. 3. Improvement of cargo handling efficiency 4. Improvement of implementation ability for environment protection and safety. 	<ul style="list-style-type: none"> - Individual ability improvement in performing the works.

Source: JICA Study Team

10.2. RECOMMENDATION ON IMPLEMENTATION PLAN OF CAPACITY BUILDING

From the abovementioned discussions, the following themes and implementation methods for the capacity building are recommended.

Table 10.2 Proposed Subjects of Capacity Building Plan and Implementation Methods

Target Recipient	Subject/ Theme	Implementation Method
A. Responsible Persons of GCPI, related Ministries	(Institutional and Organizational Improvement) 1. Port Management & Operation and Budget & Financial aspects 2. Policies on International organizations & Regulations 3. Privatization/PPP System/Policy	- Study and survey on other countries' system, modern ports. - JICA's workshop/Experts dispatch program - Workshop program by other donor countries or dedicated international organizations.
B. Management and Key Person of Responsible dept./section	(Port M&O system/method Improvement) 1. Project and Equipment procurement implementation & control ability 2. Demand forecast, Development planning 3. Port Facilities maintenance & control 4. Equipment maintenance & control 5. Environment protection, Safety 6. Budget & Financial aspects control 7. Capacity Building of Staff	(Training of responsible/key persons, trainers is effective) - Upgrading/improvement of skills/knowledge through JICA training course. - Technology transfer through implementation of projects, studies under JICA. - Training by sub-contracted specialist firms. - By providing facilities for survey/monitoring/inspection (Environment Unit) - Enhancement of GCPI Training Center.
C. Persons in Charge, Operation Staff	(Upgrading of Individual skills and ability) 1. Facilities/Equipment operation skills 2. Facilities/Equipment maintenance skills 3. Systems running/operating skills 4. Environment protection/ operation safety skills	- System suppliers training by contract. - Equipment suppliers training program by contract. - Third Country Training - Training at GCPI Training Center.

The abovementioned Subjects/ Themes are to be further divided into more specific items in finalizing the Implementation Plan. It will however be necessary to further study and re-confirm the above needs before the preparation of the Implementation plan, since some themes/items may be under on-going status being arranged by GCPI or on a list for the planned program by JICA or other international organizations.

11. REVIEW OF LONG TERM DEVELOPMENT PLAN FOR KZP

In accordance with the development concept for KZP according to Port Phase I Development Plan, the following major components have been selected for implementation towards 2035:

- Improvement of the navigational condition,
- Development of the multi-purpose berth for public services,
- Development of the container handling terminal,
- Development of the working area for relatively small ships, and
- Development of the port access road from the existing berthing area to the new port development area.

The proposed project components of the long-term development plan for KZP are summarized in Table 11.1.

Table 11.1 Long-term Project Components for KZP

Project	Contents
Navigational Condition Improvement (capacity and safety)	- Widening of the main channel from UQP to KZP and development of a new turning basin around the LPG terminal area - Widening of the channel and port basin at KZP area - Removal of 12 wrecks in the channel and port basin at KZP urgently, and all wrecks in the access channel and basin in the short- to long-term
Container Terminal Development	- one berth with terminal area in the short-term - two berths with terminal area in the long-term as extension of the first berth
Multi-purpose Terminal Development	- 9 additional berths with yard in the short-term - 22 additional berths with yard in the long-term
New Small Ship Operation Terminal	- four berths with yard in the short-term - eight additional berths with yard as extension of the first four berths in the long-term
Re-organization of Land Use in the Existing Port	
Providing suitable and sufficient spaces for better port management	- Inland yard development - Development of a new land by reclamation - Development of the back-up area along new berths toward the southern direction from Berth No.1
New Port Area Development	- Development of the small boat basin for government services - Development of the access road
Environmental Improvement	- Ecological waterfront development with mangrove planting
Port Access Road/Railway Development	- Inner port road improvement - Truck control yard development - Improvement of the utilization of the railway transport

Source: JICA Study Team

12. URGENT DEVELOPMENT PLAN

12.1. THE PROPOSED COMPONENT FOR THE PROJECT

The summary of the project components of the Port Sector Rehabilitation Project Phase II is summarized in Table 12.1

Table 12.1 Project Components of Port Sector Rehabilitation Project Phase II

Project Component	Outline of Scope of Works	Remarks
(Construction Works)		
1. Dredging Works at KZP	Dredging of Port Basin, front of berthing areas, a limited area of Access Channel. Dredging volume: 5,400,000 cu.m, Depth: -12.5m, Width: Access Channel & Berthing areas 300m, and Turning basin 450m wide.	From UQP to KZP (including KZP port area), no maintenance dredging has been done for a long time. Especially the port basin and berth front areas are serious. The Channel (UQP-KZP) is also shallow and narrow in places, and widening and deepening are required, which can be done after the dredging works in the port area by GCPI own dredgers together with the planned rehabilitation and improvement of the LNG plant berth area.
2. Shipwrecks Removal Works	Total 12 wrecks removal located in the Main Channel and KZP basin.	6 wrecks located at KZP port basin area and KZP channel, the other 6 are along the Channel to UQP. Therefore, 6 wrecks located in KZP basin and access channel are the most critical.
3. Rehabilitation of Port Facilities	Damaged Fender Replacement: 60 pcs. (KZP) Repair of Tug berth structure (KZP), Yard pavement rehabilitation (KZP), Corrosion Protection (UQP)	According to the investigation results, total 97 pcs of Fenders were lost or damaged and need replacement. Some fenders are replacing by KZP. Thus 68 pcs of appropriate and suitable fenders will be replaced. Tug berth maintenance and corrosion protection. Yard pavement repair and maintenance including drainage. All North port berths (No.12-No.21), Total Cathode 1,845 pcs.
4. Expansion of Berth at KZP	300m Extension of the existing berth No.2 to South, and utilize as Multi-purpose Berth (KZP), Also connected to Berth No.1, Design depth -12.5m	In order to handle overflowed cargoes from UQP, it is necessary to extend the existing general cargo berth at least 300m. Design ship: 20,000-30,000 DWT max.
5. Navigation Aids Works	Procure and Install 20 Light Buoys along the Channel between UQP and KZP, 2 Leading lights installation at KZP Access Channel, AIS/VTS system installation	At present only 10 light buoys are installed along the channel between UQP and KZP, whilst 25 required as minimum. It is therefore recommended to provide 20 light buoys. At present no leading light is provided for the access to KZP, thus essential for safe navigation to KZP. Necessary to install the system according to the Strategy approved and required for ISPS compliant ports.
6. Utility Works	Rehabilitation/repair works at KZP, (Water supply, electricity cables, etc.)	Water supply system, electrical cables and pits rehabilitation A part of such works can be done by the Port (GCPI). 40 quay cranes exist at UQP North, of which 24 cranes are not working. The work target is to remove total 14 nrs at Berth No.17,18 & 19 urgently for container cargo handling.
7. Removal of Unused Facilities & Equipment	Unused rail mounted quayside cranes at UQP	
(Procurement of Equipment)		
8. Cargo Handling Equipment	KZP: Container cargo handling equipment (21nrs.) , KZP: Maintenance works equipment (4nrs.) , UQP: RTG (4nrs)	Refer Table 12.5
9. Marine Equipment (UQP/KZP)	Dredger (3), Tug (3), Survey boat(1), Mooring boat (2), Anti-pollution/monitoring vessels(3), Others (7)	Refer Table 12.6

Source: JICA Study Team

12.2. DETAILS OF EACH COMPONENT

(1) Dredging Works

It is noted that the channel will have more in proportion to its depth and width, while sedimentation materials were not heavily accumulated within the channel area according to the past hydrographic survey in the channel.

It is needed to monitor the trace of the sedimentation materials by hydrographic survey in the channel area and to study the long-term dredging strategy to minimize the maintenance dredging volume.

The total dredging volume was estimated at around 5.4 million m³.

(2) Shipwrecks Removal

Regarding the removal of shipwrecks, GCPI indicated that 12 shipwrecks identified along the channel are necessary to be removed. It is proposed to remove identified wrecks (12 units) according to priority. First priority is to obtain the required depth of -12.5 m and width of 200 m/300 m in the KZP channel and basin.

It is proposed by the Study to remove wrecks along the berths in KZP as first priority and wrecks in/near UQP as second priority, and that the priority wrecks in the navigation channel may be removed by GCPI after the procurement of the lifting equipment under the Japanese ODA loan.

The shipwrecks requested for priority removal are shown in Table 12.2.

Table 12.2 Prioritized List of Wrecks to be Removed

No.	Name	Length (m)	Breadth (m)	Depth (m)	Weight (ton)	Type	Location	Position		Condition	Remarks	Risk Summary	Priority
								North	East				
1	Al-Nasr	57	12	5	990	Bunker/B	KZP	30 12.234	47 52.586	Upright	50% buried	P, X	1
2	Navy boat/B07	30	6.5	3.5	250	Iraqi Navy	KZP B No. 11	30 12.240	47 52.640	Upright	50 m out from shore	D, P, X, B	1
3	Navy boat/B08	30	6.5	3.5	250	Iraqi Navy	KZP B No. 11	30 12.240	47 52.640	Upright	50 m from shore	D, P, X, B	1
4	Unknown	40	12	3	550	Fuel Barge	KZP B. No. 9-10	30 12.084	47 52.754	Upright	Iraqi	2003	1
5	Fuel/B 07	55	15	3.5	550	Fuel Barge	KZP B5	30 11.530	47 53.310	Upright	Sunk in 1995	D, P, X, B	1
6	Nigakie Karam	25	5	3	N/A	Dhow	Khawr KZP	-	-	-	-	N, P	1
7	Hilla	110	18	14	2,737	Dredger	Khawr U/Q	29 59.994	47 59.994	Upright	Debris both sides	P	2
8	Hakmony	135	17	12.2	2,900	Cargo	Khawr U/Q	30 00.068	47 59.689	On STBD	90% buried	N, P, X, D	2
9	Noor Tug	25	8	3	250	Supply/V	Khawr U/Q	30 00.068	47 59.689	N/A	Under the Hakmony	P	2
10	Patrol/B 02	30	6.5	3.5	250	Iraqi Navy	Khawr U/Q	30 00.068	47 59.689	Upright	Port side/ Hakmony	X	2
11	Dhow	25	5	5	Unknown	Dhow	Buoy 7	29 48.846	48 28 890	Buried	100% buried	N	2
12	BFC II	110	16.33	9.93	4093	Tanker	Khawr U/Q	30 10.070	47 59.700	Capsized	7000 ton crude oil	N, P	2

Summary Key: D: Dredging, P: Pollution, X: UXO, N: Navigation, B: Berths

(3) Rehabilitation of Port Facilities

Rubber fenders along the berths in KZP

The number of the fender facilities to be replaced is summarized in Table 12.3. As the new fender for berth nos. 2, 3, and 4 has been ordered by GCPI, the number to be replaced for these berths is not accounted. In addition, the fender system for berth nos. 8 and 9 is not suitable. Therefore, adequate types of the fender facilities will be adopted for these berths.

Table 12.3 Number of Fender Facilities to be Replaced

Berth No.	Fender Type	Quantity to be Replaced
2, 3, 4	1000 H x 1700 L (K2)	0
5, 6, 7	1500 H x ϕ 1200	1
8, 9	To be replaced by the adequate types of fender	40
10	800 H x 3000 L	12
11	C-1600 H	15
Total		68

Source: Estimates by the JICA Study Team

Other rehabilitation works in KZP

Based on the above phenomenon of the reclaimed land, it is expected that further settlement of the land through second stage consolidation or lateral liquidation of the reclaimed soil will occur. As a result, the following rehabilitation works are proposed:

- Rehabilitation of buildings and warehouses, and
- Rehabilitation of yard pavement and drainage system.

Apart from the above, repair of the tug berth (berth no. 5) structure is also proposed for the berth maintenance and corrosion protection.

Corrosion protection for piles in UQP

The cathodic protection works in UQP are added because serious loss was observed on the galvanic anode materials installed at the berths in UQP. The subject of the rehabilitation works is ten berths consisting of berth no. 12 to berth no. 21.

(4) Extension of Berth at KZP

The development of the multi-purpose berth was recommended as part of the rehabilitation project (Phase II) to supplement the shortage of public service berth in KZP. The proposed multi-purpose berth will serve to accommodate different types of cargo ships (20,000~30,000 DWT max.) transporting containers, general/bagged cargoes, and bulk cargoes for public use.

It is proposed to construct one berth with length of about 300 m and depth of -12.5 m. The berth to be planned will be connected to the existing berth nos. 1 and 2.

(5) Navigation Aids Works

Light buoys along the channel

It was planned to install 25 units of buoys along both sides of the channel and at the port basin in KZP and two leading lights at the extension of the centerline of River 1 in UQP. The existing buoys were installed for indicating the existing sunken wrecks to secure safe navigation. Once all the wrecks are

removed, the existing buoys will be replaced by the new buoys with the specified colors and flashing interval lamps.

At present, only ten light buoys have been installed along the channel between UQP and KZP, while 25 buoys are required as minimum for the safety navigation. Therefore, it is recommended to provide 20 light buoys in the channel. In addition to the above, no leading light, which is essential for the safety navigation, is presently provided for the access to KZP. Accordingly, installation of two leading lights in the access channel to KZP is recommended.

AIS and VTS

In order to achieve the requirements on the safety of navigation, the Study suggests the following scope of works, for which GCPI should be responsible due to the absence of a national legislative organization (i.e., maritime authority):

- Perform initial studies and SOLAS compliance analysis;
- Establish shore-based AIS by procuring AIS with necessary training;
- Improve visual aids by providing additional buoys and leading lines;
- Strengthen Maritime Operation Centre; and
- Establish VTS in the following four steps:

(6) Utility Works

(Water supply system)

As it was planned to install a new RO plant, which is the most urgent work, using GCPI's own budget, the rehabilitation works can be limited to the repair and restoration of the water supply pipelines and pits.

(Stormwater system)

The proposed work entails cleaning all the stormwater segments designated for rehabilitation. Cleaning of the stormwater shall consist of the removal of all grease, sand, silt, solids, rags, roots, and other debris from each stormwater segment, including sags within any stormwater segment and manholes. Selection of cleaning equipment and the method for cleaning shall be based on the condition and/or pipe materials of the stormwater segment at the time the work commences, and shall comply with this specification. Flushing of any stormwater line to facilitate cleaning activities shall be done according to the enforced environmental regulations.

(Firefighting system)

The work entails replacing the underground fire hydrants and surface box frames and covers according to BS 750. The estimated total number of underground fire hydrants is 99. In addition, the work covers the intake suction pipe with a length of 330 m. This pipe needs to be replaced with a new one. A new design for the intake needs to be carried to accommodate the sand accumulation at the intake. The two pumps at the pump house need to be replaced with new ones.

(7) Power Supply

The scope of rehabilitation works will be proposed as shown in Table 12.4.

Table 12.4 Proposed Scope of Rehabilitation Works for Power Supply

Work Item	Scope of Works
Underground Cables	Install and commission the 33 kV cable and two 11 kV cables which will extend from the harbor S/S 132/33/11 kV to the Japanese S/S and the French S/S, respectively. This project is highly recommended for the rehabilitation project.
Japanese Substation	<ul style="list-style-type: none"> - Replace the 33 kV switchgear by a new set including the oil circuit breakers by SF6 breakers. This can be done by stages as the current situation does not need an urgent replacement of these breakers. - Install a new DC system to serve the whole Japanese S/S. - The 3.3 kV switchgear panel must be replaced but it can be postponed as it is currently not used. However, the replacement should also be done by stages as mentioned above.
11/0.4 kV substations	<p>Replace the 11 kV oil circuit breakers by SF6 breakers. This could be done by stages that comply with the GCPI annual investment plans.</p> <p>Replace the 0.4 kV knife switches by molded case circuit breakers. The replacement could be carried out as mentioned in the previous item.</p> <p>Install a new DC system.</p> <p>Replace the 400/230 V ship-shore transformer in S/S No. 8.</p> <ul style="list-style-type: none"> - Rehabilitate the substation building.
Steel Structure Berth Substation	This cable will come from the harbor substation passing through the new proposed substation at the main gate and S/S No. 3 and thereafter to the steel structure berth substation.
Crane Sockets and Ship-shore Sockets	<p>Rehabilitation of the existing socket outlets by installing new circuit breakers instead of switch fuses.</p> <p>Replacing the damaged terminal boxes of the sockets.</p> <p>Testing the existing cables and replacing them if necessary depending on the condition of each cable. However, it is preferable to replace all feeders to crane and ship-shore sockets through any rehabilitation project or through any annual maintenance program, because some of these cables are in bad condition.</p>

Source: The Study for Development of Southern Ports in Iraq Post-Phase I Rehabilitation Projects by GCPI

(8) Procurement of Cargo Handling Equipment

Based on the experience of procuring equipment for UQP through Japanese ODA loan, the requested cargo handling equipment for Phase II including equipment for UQP are selected and listed in Table 12.5.

It is noted that the cargo handling equipment at UQP procured under Phase I is not sufficient to meet the traffic demands in 2010. Therefore, it is necessary to procure cargo handling equipment urgently required for UQP and KZP as a part of the Phase II project.

Table 12.5 List of Cargo Handling Equipment Proposed for the Phase II Project

Port	Equipment	Spec.	Quantity	Remarks	
KZP	Reach stacker	42 t	2 units	For handling container (1 for quay & 1 for yard)	
	Straddle Carrier	42 t	2 units	For handling container	
	Forklift	20 t	2 units	For handling general cargo	
	Trailer		3 units	For handling container	
	Chassis	20'~45'	6 units	For handling container	
	Mobile cranes		50 t	1 unit	For handling container & general cargo Tire-mounted type
			15 t	1 unit	
	Workshop vehicle		1 unit	For maintenance & cleaning	
	Sweeping vehicle		1 unit		
	Back Hoe		1 unit		
Dumping Lorry	20 t	1 unit			
UQP	RTG	40 t	4 unit	UQP North Container Berth	

Source: JICA Study Team

(9) Procurement of Marine Equipment

The GCPI has requested the purchase list of marine equipment shown in Table 12.6 for the Port Sector Rehabilitation Project Phase II.

Table 12.6 Marine Equipment List

Port	Equipment	Spec.	Quantity	Remarks
UQP/KZP	Mooring boat	< 10 m long	4 units	
	Service boat	< 10 m long	2 units	
	Pilot boat	< 10 m long	1 unit	
	Cutter dredger (CSD)	1,500 m ³ /hr	1 unit	
	Grab dredger	1,500 m ³	1 unit	
	Trailing suction H. dredger (TSHD)	3,500 m ³	1 unit	
	Lightning vessel		1 unit	
	Survey boat	> 12 m long	1 unit	With suitable lifting crane
	Service pontoon for salvage dep't	2,000 t class	2 units	20 m (W) x 60 m (L) x 3 m (D) equipped with 80 t crane
	Firefighting boat	2,000 HP	2 units	
	Anti pollution boat		1 unit	Standard type with treatment plant
	Anti pollution monitoring boat	High speed boat	2 units	
Tug boat	3,000~4,000 HP	3 units		

Source: JICA Study Team

13. PROJECT COST AND IMPLEMENTATION SCHEDULE

13.1. PROJECT COST

13.1.1 BASE OF THE COST ESTIMATE

(1) Base Year

The base year considered for the project cost estimate is year 2012.

(2) Exchange Rates

The following exchange rates have been considered.

- USD 1 = JPY 78.50
- USD 1 = ID 1,166
- ID 1 = JPY 0.07

(3) Price Escalation

Price escalations for foreign currency and local currency considered are as follows:

- 2.10 % per annum for foreign currency
- 6.70 % per annum for local currency

(4) Physical Contingency

Physical contingency for each component has been applied at the following percentages based on the experiences on the Phase I project.

- Construction Works : 20 %
- Procurement of Equipment : 20 %
- Consulting Services : 5 %

(5) Value Added Tax (VAT) and Taxes

The value added tax (VAT) and income tax were not considered.

(6) Administrative Costs

Administrative costs including duties and taxes were assumed at least 5 % as non-eligible portion.

13.1.2 COMPONENTS FOR PROJECT COST ESTIMATION

The proposed components are summarized in Table 13.1, which have been considered for project cost estimation.

Table 13.1 Components for Project Cost Estimation

No.	Project Component	Scope of Works (Full Scale)	Remarks
1	Dredging Works at KZP	Dredging of port basin, front of berthing areas, a limited area of access channel, dredging volume: 5,400,000 m ³ , depth: -12.5 m, width: access channel and berthing areas 300 m, and turning basin 450 m wide	
2	Shipwrecks Removal	Total 12 wrecks removal located in the main channel and KZP basin	
3	Rehabilitation of Port Facilities	Damaged fender replacement: 68 pcs (KZP) Repair of tug berth structure (KZP), yard pavement rehabilitation (KZP), corrosion protection (UQP).	
4	Extension of Berth at KZP	Extension of the existing berth No.2 to south, and utilize as multi-purpose berth (KZP), also connected to surrounding berth, design depth -12.5 m	
5	Navigation Aids Works	Procure and install 20 light buoys along the channel between UQP and KZP, 25 buoys required. Of which, 10 buoys installed. For UQP/KZP channels, two leading lights installation at KZP access channel, AIS/VTS system installation	
6	Utility Works	Rehabilitation/repair works at KZP (water supply, electricity cables, etc.)	
7	Removal of Unused Facilities and Equipment	Removal of unused rail mounted quay side cranes at UQP	
8	Cargo Handling Equipment	KZP: container cargo handling equipment (21 nrs), KZP: maintenance works equipment (4 nrs), UQP: RTG (4 nrs)	
9	Marine Equipment (UQP/KZP)	Dredger (3), tug (3), survey boat(1), mooring boat (2), anti-pollution/monitoring vessels(3), and others (7)	

Note: The detail of the proposed components is referred in Chapter 14 of the Urgent Development Plan.

Source: JICA Study Team

13.1.3 PROJECT COSTS

The summary of the project costs is shown in Table 13.2.

Table 13.2 Summary of Estimated Project Costs

	Actual Proportion		Total (Equivalent to JPY)			Total (Original)		
	FC	LC	FC 1,000JPY	LC 1,000JPY	Total 1,000JPY	FC 1,000JPY	LC 1,000USD	Total 1,000JPY
A. ELIGIBLE PORTION								
I) Construction and Procurement			64,993,870	8,464,082	73,457,952	64,993,870	107,822.70	73,457,952
I.1 Dredging Works at KZP	83.3%	16.7%	5,318,117	1,067,670	6,385,788	5,318,117	13,600.90	6,385,788
I.2 Shipwrecks Removal Works	79.6%	20.4%	4,434,617	1,135,329	5,569,946	4,434,617	14,462.79	5,569,946
I.3 Rehabilitation of Port Facilities	59.0%	41.0%	1,291,849	898,383	2,190,232	1,291,849	11,444.37	2,190,232
I.4 Extension of Berth at KZP	70.5%	29.5%	5,311,607	2,221,822	7,533,429	5,311,607	28,303.46	7,533,429
I.5 Navigation Aids Works	97.3%	2.7%	2,247,750	62,100	2,309,850	2,247,750	791.08	2,309,850
I.6 Utility Works	0.0%	100.0%	0	362,954	362,954	0	4,623.62	362,954
I.7 Removal of Unused Facilities and Equipment	83.7%	16.3%	332,517	64,780	397,296	332,517	825.22	397,296
I.8 Procurement of Cargo Handling Equipment	99.1%	0.9%	1,952,730	16,980	1,969,710	1,952,730	216.31	1,969,710
I.9 Procurement of Marine Equipment	99.1%	0.9%	30,728,625	285,848	31,014,472	30,728,625	3,641.37	31,014,472
Base Project Cost for (I.1 to I.9)			51,617,811	6,115,865	57,733,677	51,617,811	77,909.11	57,733,677
Price Escalation			3,052,496	1,125,044	4,177,540	3,052,496	14,331.77	4,177,540
Physical Contingency			10,323,562	1,223,173	11,546,735	10,323,562	15,581.82	11,546,735
II) Consulting Services			1,520,074	1,442,043	2,962,116	1,520,074	18,369.97	2,962,116
Base Project Cost for (E/S)			1,391,513	1,210,543	2,602,056	1,391,513	15,420.93	2,602,056
Price Escalation			58,985	170,972	229,958	58,985	2,177.99	229,958
Physical Contingency			69,576	60,527	130,103	69,576	771.05	130,103
Total of A. (I + II) : BASE PROJECT COSTS			66,513,943	9,906,125	76,420,068	66,513,943	126,192.67	76,420,068
B. NON ELIGIBLE PORTION								
a. Land Acquisition and Compensation Cost		0.00%	0	0	0	0	0.00	0
b. Administration Cost		5.00%	0	3,821,003	3,821,003	0	48,675.20	3,821,003
c. VAT		0.00%	0	0	0	0	0.00	0
d. TAX and Duties		0.00%	0	0	0	0	0.00	0
Total of B. (a. + b. + c. + d.)			0	3,821,003	3,821,003	0	48,675.20	3,821,003
TOTAL (A. + B.)			66,513,943	13,727,128	80,241,071	66,513,943	174,867.87	80,241,071

Source: JICA Study Team

13.2. IMPLEMENTATION SCHEDULE

13.2.1 WORK DURATION OF EACH COMPONENT

The work duration of each component of the proposed project is summarized in Table 13.3.

The total project implementation period is estimated about 66 months including 12 months of maintenance period.

Implementation schedule has been estimated according to the experiences of Phase I project and is shown in Table 13.4.

Table 13.3 Estimated Duration of the Project Components

No.	Project Components	Construction Period
1.	Dredging Works at KZP	12 months
2.	Shipwrecks Removal Works	24 months
3.	Rehabilitation of Port Facilities	17 months
4.	Extension of Berth at KZP	28 months
5.	Navigation Aids Works	24 months
6.	Utility Works	17 months
7.	Removal of Unused Facilities and Equipment	12 months
8.	Procurement of Cargo Handling Equipment	26 months
9.	Procurement of Marine Equipment	31 months
10.	Consulting Services	66 months

Source: JICA Study Team

13.3. PROJECT SCOPE OPTIONS

The following project scope options have been examined considering the proposed priorities of respective components:

- Option 1: Base case (full scale option).
 Option 2: Shipwrecks removal work, removal of unused facilities/equipment, and marine equipment are minimized according to the priority, as follows;
- Shipwrecks removal: six wrecks identified as Priority 2 are excluded,
 - Removal of unused facilities/equipment: ten quay cranes (24 total) are deleted as uncertain for removal (may be repaired), and
 - Marine equipment: depending on the priority of dredger type requirement, this item is further divided into two cases.

Note:

GCPI has a plan to purchase new dredgers, instead of repairing some dredgers, of type either TSHS or CSD, or both. Therefore, Option 2A, Option 2B and Option 3as stated below reflects such selection of dredger types, if decided to purchase.

Option 2A: Exclude the following marine equipment in addition to the above.

- Two dredger (GHD, TSHD); and
- Two of mooring boats and services boats, one each of fire-fighting boat, anti-pollution monitoring boat, and tug boat.

Option 2B: Exclude some marine equipment, but dredger type excluded is CSD (instead of GHD).

- Option 3: In addition to Option 2B work component, further exclusion of the marine equipment;
- Grab dredger (Priority 2).

- Option 4: Further exclusion of the following works from Option 3;
- One each of lighting boat, survey boat, two tug boats

The above examined options and the estimated project costs are summarized in Table 13.5 and Table 13.6, respectively.

Table 13.5 Project Scope Options

No.	Items	Option-1 (Base Case)	Option-2A	Option-2B	Option-3	Option-4
1.	Dredging (KZP)	5.4 million m ³	5.4 million m ³	5.4 million m ³	5.4 million m ³	5.4 million m ³
2.	Shipwrecks Removal	12 wrecks (all)	6 wrecks, (Priority-1)	6 wrecks, (Priority-1)	6 wrecks, (Priority-1)	6 wrecks, (Priority-1)
3.	Port Facilities Rehabilitation	Full scale	Full scale	Full scale	Full scale	Full scale
4.	Extension of Berth at KZP	Included	Included	Included	Included	Excluded
5.	Navigation Aids	Included	Included	Included	Included	Excluded AIS/VTs
6.	Utility Works	Included	Included	Included	Included	Included
7.	Removal of Unused Facilities and Equipment	Removal of 24 Jib cranes	14 Jib cranes as Priority-1	14 Jib cranes as Priority-1	14 Jib cranes as Priority-1	14 Jib cranes as Priority-1
8.	Cargo Handling Equipment	All included	All included	All included	All included	All included
9.	Marine Equipment (total 18 ships)	All included	Selected item, (Priority 2 and 3)	Selected item, (Priority 2 and 3)	Selected item, (Priority 2 and 3)	Selected item, (Priority 2)

Source: JICA Study Team

Table 13.6 Summary of Project Costs of Options

(Unit: JPY million)

Options	Scope	FC	LC	Total
Option-1	Original (full scope)	66,514	13,727	80,241
Option-2A	Delete six shipwrecks, 8 kinds & 10 no. of ships (GHD, TSHD), and ten sets of Jib crane removal from the original	39,785	11,056	50,841
Option-2B	Delete six shipwrecks, 8 kinds & 10 no. of ships (CSD, TSHD), and ten sets of Jib crane removal from the original	35,891	10,819	46,710
Option-3	Delete six shipwrecks, nine kinds & 11 no. of ships (CSD, GHD, TSHD), and ten sets of Jib crane removal from the original	30,798	10,508	41,307
Option-4	Delete six shipwrecks, eleven & 15 no. kinds of ships (CSD, GHD, TSHD), ten sets of Jib crane removal from the original	27,580	10,312	37,892

Source: JICA Study Team, Note: Exclude Interest during Construction

14. ENVIRONMENTAL CONSIDERATION ON URGENT DEVELOPMENT PLAN

14.1. INTRODUCTION

The environmental baseline survey at KZP was conducted in the Phase I project and an initial environmental examination (IEE) report was prepared. Supplemental study for the IEE report was also conducted². Through these studies and based on the rehabilitation plan, the necessity for another study was realized.

Based on the situation, a field survey at KZP was conducted in this study to obtain additional information for the purpose of understanding the present environmental conditions for dredging works and removal of wrecks. The survey was commissioned to a local based environmental consultant. Jordanian based local assistants were also employed to conduct selection of the consultant, supervision of works, examination of the results during the field survey, and preparation of the report.

Based on the studies mentioned above, the IEE report prepared in the SAPROF study was updated. Although the stakeholder meeting is not conducted yet, it is scheduled to be held in order to notify the related people/organizations about the project and to reflect their opinions on the project implementation.

14.2. LEGAL FRAMEWORK

14.2.1 GENERAL LAWS/REGULATIONS

Laws and regulations relating to the environmental and social considerations in Iraq were studied.

14.2.2 PROJECT CATEGORIZATION

Other than the laws listed in the previous section, laws in Iraq and international guidelines related to EIA were studied to understand the project categorization.

a series of study for EIA procedure based on Iraq's laws, JICA guideline and World Bank guideline concluded that this project would be categorized as B, which required the preparation of IEE.

14.3. FIELD RECONNAISSANCE

Upon conducting the environmental field survey, field reconnaissance was carried out to know the situation about the target area. Refer to the report (hereinafter referred to as the Reconnaissance Report) in Appendix B: Environmental Baseline Survey Report for the details.

² Port Sector Rehabilitation Project Marine Environmental Survey at Umm Qasr & Khor Al Zubayr Port, Final Report, Marine Science Center, University of Basrah, July 2009.

14.4. LITERATURE SURVEY

14.4.1 COASTAL ECOSYSTEM

Available information indicates that oil pollution remains a constant threat to coastal ecosystems although the area has largely recovered from the huge oil spills of the First Gulf War and from more recent large spills (e.g., bombing of tankers and the Mina al-Bakr offshore oil terminal). No existing protected areas will be affected by the project.

14.4.2 FAUNA AND FLORA

According to IUCN Red List³, ten animal species were recognized as being threatened with extinction at the global level can be found in Kuwait and Iraq Regions.

There are no known fish nurseries in the directly affected area.

No existing survey data indicates the presence, or possibility of presence of sea grasses in project affected areas.

There are no records of surveys of flora in the area.

There are no corals and mangroves in project affected area.

14.4.3 COASTAL HYDRODYNAMICS

This implied a maximum tidal range of about five meters.

No recorded wave data existed for any study area but observations by GCPI indicated that wave heights in excess of 1 m do not generally occur in KZ.

The magnitude of the currents/tidal streams is not quantified in the Arabian Gulf Pilot. However, data from UQ indicated that the tidal currents are set mainly on the (NNW and the SSE which could reach up to three knots (1.5 m/sec). Data reported by USAID (2003) recorded tidal currents of up to four knots (2.1 m/sec).

14.4.4 WATER QUALITY

No water quality sampling program is underway for project affected water bodies.

14.4.5 SEDIMENT QUALITY

Two survey programs have been undertaken since 2002 to assess the contamination in KAZ and KA. Over 200 samples were taken from 40 sites, 35 wreck sites, and five mid-channel sites.

The characteristics of the sediment at the center of the channel are summarized as follows:

- Compared to North American sediment quality criteria, cadmium, copper, lead, mercury, and zinc concentrations were generally low. For arsenic, one sample exceeded the sediment quality guideline values, but represented no pollution threat when considering the average metal content in the sediments from the vicinity. Both chromium and nickel exhibited consistently high concentrations, interpreted due to the mineralogy of the suspended sediment in the river.
- The uranium concentrations were consistent with the crustal abundance and 235U:238U ratios also reflect a natural source for this element.

³ IUCN Red List of Threatened Animals, 1990, compiled by WCMC

- TPH (total petroleum hydrocarbon) content at one mid-channel site, near the entrance to KA, was high and suggested that there is contamination of the site even though the concentration of total PAHs at all locations did not exceed the North American Guideline value (Long et al. 1995).
- There is no evidence of organochlorinated compound pollution. The concentrations were generally low for both wide range of chlorinated pesticides and several PCB congeners. Total levels of DDTs and PCBs including the Aroclor 1254 mixture, did not surpass North American Sediment Quality Guideline values.

14.4.6 SOCIO ECONOMIC CONDITION

There are no residential areas in the immediate vicinity of project activities. The town of Umm Qasr is located around 4 km from the port area and has a population of around 50,000. There are no known sites of architectural or historical heritage and archaeological site in the project area. Although the project area is theoretically restricted, where fishing is prohibited, fishing activities are being performed and it is an important economic activity to local population.

14.5. FINDINGS BY THE FIELD SURVEY

In this section, findings from field reconnaissance and field survey are summarized (refer to Appendix B: Environmental Baseline Survey Report for the details).

14.5.1 PORT AND SEA ROUTE

(1) Water Quality

- The chemical data showed that pollution indicators like oil (petroleum hydrocarbons), nitrogen, phosphate, and BOD were generally low and did not indicate significantly polluted waters.
- Overall, the marine waters did not seem to be displaying signs of pollution or environmental degradation in relation to the parameters being assessed and the water quality could generally be described as good.
- Comparing with the result from previous survey⁴ conducted at similar locations, the situation of water environment seems to have recovered in good condition with less pollution and less eutrophication.

(2) Sediment Quality

- The sediment samples collected throughout the survey period at all locations showed no evidence of significant contamination.
- The Particle Size Distribution (PSD) results from the survey indicated predominantly comprised of silt and clay fractions with minor sand components.

⁴ Port Sector Rehabilitation Project Marine Environmental Survey at Umm Qasr and Khor Al Zubayr Ports -Final Report- July 2009, Marine Science Center, University of Basrah.

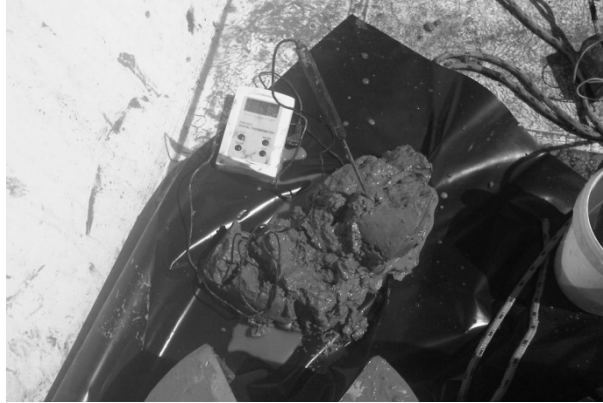


Photo 14.1 Condition of Sediment

- DDT and PCBs were not detected while total dioxins and total furans were detected at several sampling points. The detected concentrations of both parameters were below the Canadian Marine Sediment Quality Guidelines for the Protection of Aquatic Life (21.5 ng-TEQ/kg for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo furans).

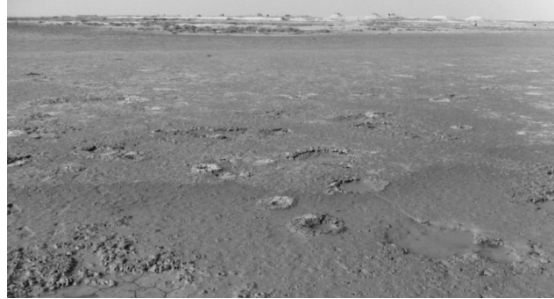
14.5.2 DUMPING SITE

(1) Soil

- None of the concentration of tested parameters was significantly high, although concentrations of nickel exceeded the stringent Canadian Soil Quality Guideline for the Protection of Environmental and Human Health. This exceedance may represent elevated background concentrations rather than a pollutant source.
- With regards to PAH, the elevated concentrations recorded in Area A were likely to be a result of accidental spills at KZP.
- No field evidence of any hydrocarbon contamination was noted during the collection of these samples.
- Analysis of the mean concentrations of metals for each area showed a spatial trend with respect to copper, nickel, lead, zinc, iron, and manganese.
- The highest mean concentrations were consistently recorded in Area A, followed by Area B, Area C, and then Area D.
- Mean arsenic concentrations were found to be highest in Area B, followed by Areas C, A, and D.
- The presence of dioxins and furans were recorded in all areas, with the highest total concentrations being recorded in Area A. The toxic equivalent upper bound concentrations (worst case scenario) for both the total dioxins and furans were below the Canadian Marine Sediment Quality Guidelines for the protection of aquatic life (21.5 ng TEQ/kg for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo furans) and therefore not considered to be significant.

(2) Ecological Characteristics

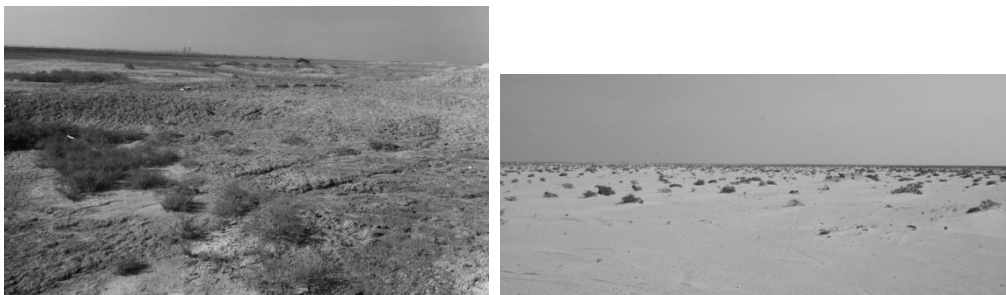
- Areas A and B provide important intertidal areas. A habitat for amphibians and crustaceans, and thus, provide a food source for migratory and permanent residual birds.



Source: EAME, 2012

Photo 14.2 Intertidal Area (Area A)

- Areas C and D predominantly comprise alluvial plains and *sabkhas* which are only able to support particular vegetation and, thus, have a smaller area to support watering birds.



Source: EAME, 2012

Photo 14.3 Alluvial Plain (Area C: Left) and Sabkha Area (Area D: Right)

- None of the vegetation observed during the site visit is of conservation importance.
- Overall, Areas C and D are considered to be the least ecologically sensitive of the four areas, and would be the most favorable sites for the deposition of the dredged material.
- Khor Al-Zubayr has been included as one of Iraq's key biodiversity areas and has been classified as an important bird area (IBA). The IBA comprises all of Areas A and B, as well as the intertidal zones of C and D.
- The habitat maps produced during desk study have proven to be very accurate and have been slightly updated following the field surveys.
- The highest mean concentrations of contaminants were consistently recorded in Areas A and B (copper, nickel, lead, zinc, iron, manganese, TPH, and dioxins). For this reason, it may also be preferable to deposit dredging materials in Areas C and D to reduce the contaminant loading on Areas A and B.

14.6. ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

Based on the literature survey and field survey, the impact caused by the project and its mitigation measures for each construction activity were studied and summarized in tables of final report.

14.7. ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING PLAN

14.7.1 ENVIRONMENTAL MANAGEMENT PLAN

An environmental management plan (EMP) is one of the requirements of EIA procedure. Based on the study for impact and mitigation measures, EMPs were prepared as shown in Table 14.1.

Table 14.1 Summary of the Environmental Management Plan

Management Plan	Outline
Construction Management Plan	This addresses general construction management such as waste including oil and lubricants, maintenance of equipment, control of noise and dust, and so on.
Waste Management Plan	Management plan of pre-existing wastes (excluding UXO), wreck decontamination wastes, and future operational wastes.
Dredging Management Plan	Environmental management plan on dredging
Wreck Management Plan	Plan for individual salvage operation
Salvage Health and Safety Plan	This plan is intended to help prevent accidents, illnesses, and injuries, to increase safety awareness, to reduce institutional liability, and to establish safety responsibilities for individuals within the area.
Oil Spill Contingency Plan	The overall objective of the plan is to prevent and to limit as far as practicable the adverse consequences of any spill that might arise from the wreck recovery operations.

14.7.2 MONITORING PLAN

Monitoring plan is also one of the requirements in EIA process.

Table 14.2 Draft Monitoring Plan

Sub-plan	Activity	Location	When/Frequency	Parameter	Baseline Status
Environmental Quality Monitoring	Monitoring of surface water quality	Seven sites in Iraqi waters KZP (two sites) KZ Channel UQP (two sites) River 1 entrance KZ downstream River 1 confluence.	Monthly throughout project operations.	pH, conductivity, temperature, coliform, T-N, T-P, heavy metals, TOC, TDS, and TPH.	
	Groundwater quality and level	Two wells UQP Two wells KZP	Quarterly	Water level, pH, conductivity, temperature, T-N, T-P, TOC, TDS, heavy metals, dioxins and TPH.	
Wreck Management Plan	Post removal hydrographic surveys of site	Each wreck		Channel bathymetry; Bathymetry of dump sites	
	Sediment contaminants	Each wreck	Every 50 cms of sediment removal including sample from vessel bottom layer	As per UNDP study	UNDP 2004 survey provides snapshot assessment
Dumping Site	Discharge of water from outlet	Outlet form dumping area	Monthly	pH, conductivity, temperature, ammonia and ammonium, TOC, TDS, heavy metals, dioxins and TPH	
Coastal Area	Ecosystem	Both sides of the channel	Occasionally	Visual inspection of change at intertidal zone	

14.8. INSTITUTIONAL RESPONSIBILITY

A summary of the primary activities of each agency is provided below in Table 14.3.

Table 14.3 Proposed Responsibility for the Implementation of the Environmental Management

Action No.	Task	Responsible Agency							
		MOT	IPA-EU	PMT	CONST	POC	ROPME	CONT	MOE
Pre-Construction									
1	Establish EU within IPA; identify and train relevant staff	R		E	S	N			N
2	Define and demarcate all UXO exclusion zones and develop UXO ERP; Confirm all affected land areas are within the port boundaries		N	E	N			N	N
3	Confirm the requirement for any additional survey and management planning; finalize details of additional requirement			E	S				
4	Finalize the communication strategy	R		E	S				
5	Implement the external communications strategy			E	S		N		
6	Finalize the EMP for inclusion in the tender documents for dredging, wreck removal, and general construction works	R	R	E	E		S		
7	Undertake the preparatory surveys			E	S				
Wreck Removal (each wreck)									
8	Undertake the familiarity training with contractor	R	R	E	E			S	
9	Supervise the construction of on shore cleaning area		E	R	S				
10	Undertake the ERP exercise training for land sites		E	R	S				
11	Prepare the monitoring program: shore and offshore		E	R	S				
12	Undertake the monitoring		E	R	S				
13	Prepare the final report for each wreck		E	R	S		N		
14	Prepare the progress reports for the PMT, POC, and JBIC	N	E	R	S		N		N
Dredging									
15	Undertake familiarity training with contractor		R	E	E			S	
16	Monitor the preparation of on shore dump area		E	R	S				
17	Undertake the ERP exercise training								
18	Prepare the monitoring program: shore and offshore		E	R					
19	Undertake the monitoring		E	R					
20	Prepare the final report		E	R			N		
21	Prepare the progress reports for the PMT, POC, and JBIC	N	E	R			N		N
Construction Management Plan									
22	Prepare the monitoring program		E		S			N	
23	Undertake the monitoring		E						
24	Prepare the final report		E	R					
25	Prepare the progress reports for the PMT, POC, and JBIC		E	R					N
Waste Management Plan									
26	Inventory of existing sites		E						
27	Prepare waste receiving areas and define operating criteria		R	E					
28	Specify the handling and storage procedures to be adopted to minimize loss or leakage, and for clean up of small spills and general hazards to public health		E	R					
29	Provide appropriate clothing and equipment			E					
30	Develop plan for the transfer, storage, and eventual disposal of		E	R					

Action No.	Task	Responsible Agency							
		MOT	IPA-EU	PMT	CONST	POC	ROPME	CONT	MOE
	salvage and waste materials from wreck.								
31	Supervise the decontamination plan		E						
32	Prepare the progress reports for the PMT, POC and JBIC	N	E	R					N
33	Sign-off the decontamination site		E	R					N
34	Prepare the hazardous waste management plan		E	R					
Khawr Abdullah Management Plan									
35	Prepare the scope of work for management plan		R	R	E		R		R
36	Prepare the tender		R	R	E		R		R
37	Award the contract-dependent on agreed executing body and agreed client								
38	Prepare the report		S				S	E	
39	Review the management plan		R	R			R		R
40	Implement the management plan		S	E			N		n

Key: R= Review/clear, E= Execute, S= Support, N= Notified

Legend:

PMT: Project Management Team

MOT: Ministry of Transport Safeguard Focal Point

IPA-EU: Environmental Unit IPA

CONS: Project Consultants

JICA: Japan International Cooperation Agency

POC: Project Oversight Committee at the Ministry of Planning and Development Cooperation

CONT: Contractor

ROPME: Regional Organization for the Protection of the Marine Environment

14.9. STAKEHOLDER MEETING

To date, the team has completed the following activities:

- Review of the legislative requirements of environmental protection in Iraq;
- Recruitment of a consultant to conduct the baseline survey for water and sediment in the project area;
- Completion of the selection of data collection points and scheduling of the sampling activities;
- Review of the general environmental conditions of the project area; and
- Examination of the proposed disposal sites for the dredging activities proposed in the project.

Once all documents are circulated and the IEE report is confirmed, a meeting is planned to be held in Basra.

- To inform the result of study
- To inform the environmental and social consideration
- To obtain agreement to the project
- To inform the project schedule

14.10. CONCLUSIONS AND RECOMMENDATIONS

Supplemental study to update the IEE prepared in the SAPROF study was carried out. The major points in this study are as follows:

- Desk-based study was carried out to supplement the baseline data.
- Legal framework was studied to update the information for environmental and social considerations.
- A series of study for EIA procedure based on Iraqi's law, JICA Guideline and World Bank Guideline concluded that this project would be categorized as Category B, which requires the preparation of an IEE.
- According to Iraqi environmental law, the ECC shall be obtained to start the project. IEE in this case is necessary to obtain the certificate.
- Water quality survey along the sea route did not show any major pollution including nutrient and oil.
- The results of the survey and the analysis of information gathered during the desk-based study suggested a dynamic and active environment with substantial mixing and movement of water and sediments over across seasons and over longer periods of time.
- Comparing with previous study results conducted in 2009, the water environment seems to have recovered as less pollution and less eutrophication.
- Sediment quality however, indicated some contaminations such as dioxins, furans, arsenic, total nitrogen, total sulphur, copper, and nickel.
- The rehabilitation project clearly has the potential to increase sediment load in the water column during the construction (and especially) dredging phases. Given the dynamic environment, however, and the fact that a large part of the study area is subject to regular high suspended sediment loads from natural processes, the impact of sediment mobilized by the construction activity is likely to be short-lived and of limited significance.
- With regards to the overall ecological sensitivity of the four areas, Areas C and D are the least sensitive, and therefore considered to be the most suitable for the deposition of the dredged material. The habitat maps produced during the desk-based study have proven to be very accurate and have been slightly updated following the field surveys.
- The highest mean concentrations of contaminants were consistently recorded in Areas A and B (copper, nickel, lead, zinc, iron, manganese, TPH, and dioxins). For this reason, it may also be preferable to deposit dredging in Areas C and D to reduce the contaminant loading on Areas A and B.
- Soil quality in candidate dumping site showed minor contamination in dioxins, furans, and arsenic, although these concentrations satisfy the guideline values.
- Therefore, measures to discharge water from dumping site and establishment of monitoring plan are recommended.
- As intertidal zone is ecologically important, change of the zone shall be avoided as much as possible. In case change is necessary, effort for recovery of the zone is recommended.
- The ecology of the intertidal zones in areas C and D (if used) should be monitored again after the deposition works have been completed to determine if significant impacts have been successfully avoided.

15. RECOMMENDATION ON STEP FORWARD

In response to the request of the Government of Iraq, the Government of Japan through the Japan International Cooperation Agency (JICA) has been considering a further financial and technical assistance/cooperation to the Iraqi port sector, as a subsequent support to the Port Sector Rehabilitation Project, which are:

- 1) Port Sector Rehabilitation Project Phase II under Japan's ODA loan scheme, and
- 2) Port Master Plan Study under Japan's technical cooperation (grant scheme).

This Study has been carried out in order to collect necessary and useful information to be provided for further Japanese assistance. It aims to enhance the efficiency of port management and operations, and to review the requested scope and contents of such port sector rehabilitation and improvement projects by collecting, analyzing, and updating the available data and information related to the projects.

15.1. PORT SECTOR REHABILITATION PROJECT PHASE II

Through the Study, latest information and data related to transport and port sectors have been collected as much as possible, and the present situation of the existing ports and cargo traffic forecast have been updated utilizing those data as the base for the review and evaluation of the required Urgent Development Project described in the report for Post Phase I Port development Plan.

The scope and component is summarized in Table 15.1.

Table 15.1 Proposed Scope and Work Components of the Phase II Project

No.	Project Component	Scope of Works (Full Scale)	Remarks
1	Dredging Works at KZP	Dredging of port basin, front of berthing areas, a limited area of access channel, dredging volume: 5,400,000 m ³ , Depth: -12.5 m, Width: access channel and berthing areas 300 m, and turning basin 450 m wide	Most critical
2	Shipwrecks Removal	Total 12 wrecks removal located in the main channel and KZP basin.	Most critical
3	Rehabilitation of Port Facilities	Damaged fender replacement: 68 pcs (KZP) Repair of tug berth structure (KZP), yard pavement rehabilitation (KZP), corrosion protection (UQP)	Critical
4	Extension of Berth at KZP	Extension of the existing Berth No.2 to south, and utilize as multi-purpose berth (KZP), also connected to surrounding berth, design depth -12.5 m	Container berth construction deleted as not so critical
5	Navigation Aids Works	Procure and install 20 light buoys along the channel between UQP and KZP, 25 buoys required. Of which, 10 buoys installed. For UQP/KZP channels, two leading lights installation at KZP access channel, AIS/VTS system installation	Navigation Aids are critical AIS/VTS need a further study
6	Utility Works	Rehabilitation/repair works at KZP (water supply, electricity cables, etc.)	Critical
7	Removal of Unused Facilities and Equipment	Removal of unused rail mounted quay side cranes at UQP	Need for further study of the status
8	Cargo Handling Equipment	KZP: container cargo handling equipment (21 nrs), KZP: maintenance works equipment (4 nrs.), UQP: RTG (4 nrs)	Critical
9	Marine Equipment (UQP/KZP)	Dredger (3), tug (3), survey boat(1), mooring boat (2), anti-pollution/monitoring vessels(3), others (7)	Dredger(s) is most critical

Source: JICA Study Team

Based on the estimated project cost, the total project cost as full scope is estimated approximately 80 Billion JPY.

It is expected to utilize new loan that a case study has been carried out to determine a reasonable loan amount according to the priority of the respective work components, as a part or whole. In order to restore and improve both port facilities and functions to cope with the increasing cargo traffic demand, the

proposed scope and work components of the project are all deemed necessary. As such, the priority has been determined mainly through urgency.

The results of the case study are shown in the Table 15.2.

Table 15.2 Results of the Case Study for Loan Amount Options

(Unit: JPY million)

Options	Scope	FC	LC	Total
Option-1	Original (full scope)	66,514	13,727	80,241
Option-2A	Delete six shipwrecks, 8 kinds & 10 no. of ships (GHD, TSHD), and ten sets of Jib crane removal from the original	39,785	11,056	50,841
Option-2B	Delete six shipwrecks, 8 kinds & 10 no. of ships (CSD, TSHD), and ten sets of Jib crane removal from the original	35,891	10,819	46,710
Option-3	Delete six shipwrecks, nine kinds & 11 no. of ships (CSD, GHD, TSHD), and ten sets of Jib crane removal from the original	30,798	10,508	41,307
Option-4	Delete six shipwrecks, eleven & 15 no. kinds of ships (CSD, GHD, TSHD), ten sets of Jib crane removal from the original	27,580	10,312	37,892

Source: JICA Study Team. Note: Above amount excludes interest during construction.

From the above review results, it is recommended that the proposed Urgent Development Project needs to be implemented at an earliest possible time, as Port Sector Rehabilitation Project Phase II, by discussing with MOT/GCPI and the ministry in charge on the selection of loan type and amount.

In selecting loan type, the following categorization together with the packaging of the work component is suggested:

Table 15.3 Project Package and Loan Type

Package	Project Component	ODA Loan Type
PACKAGE-1 1.1 1.2	DREDGING & WRECK REMOVAL Dredging Work Shipwrecks Removal	Un-tied loan
PACKAGE-2 2.1 2.2 2.3	MARINE/CIVIL WORKS Rehabilitation of Port Facilities Berth Extension Navigation Aids	Tied (STEP)
PACKAGE-3 3-1 3-2	EQUIPMENT Cargo Handling Equipment Marine Equipment	Tied (STEP)
PACKAGE-4 4.1 4.2	UTILITY & REMOVAL Removal of Un-used Facilities and Equipment Utility Works	Un-tied loan (by local competitive bidding)

Source: JICA Study Team

15.2. PORT MASTER PLAN STUDY

Accordingly, it is recommended to conduct the Port Master Plan Study under re-naming as Port Sector Development Study, which will be composed of;

- 1) Formulation of the port master plan,
- 2) Improvement plan of port management and operation, and
- 3) Capacity building plan.

15.2.1 PORT MASTER PLAN STUDY

The outline of Port Master Plan Study will be as follows;

(1) Objectives and Study Ports

- a. To identify development potential and define the future role of the study ports.
- b. To prepare a port development strategy of the study ports comprising demand forecast, roles and functions, and a concept of the long-term development plan including a privatization scheme.
- c. To prepare a master plan for comprehensive development of UQP and KZP taking into account the functional allotment between two ports.
- d. To prepare a short term development plan for UQP and KZP.

The study ports are Umm Qasr Port (UQP), Khor Al Zubayr Port (KZP), Maqil Port, Abu Flus, and new Al-Faw Port.

(2) Scope of the Study

In order to achieve the objectives, the Study will cover the following items;

- a. Analysis of the present conditions and review of the existing studies and related development plans including but not limited to;
 - Transport Master Plan by Italian Consortium,
 - Basrah Refinery Project (under Japan's ODA),
 - Khor Al Zubayr Fertilizer Plant Rehabilitation Project (under Japan's ODA), and
 - Crude Oil Export Facility Rehabilitation/Reconstruction Plans including Sealine Construction Project under Japan's ODA.
- b. Preparation of a port development strategy of the study ports other than Al-Faw Port including cargo demand forecast (target year 2035).
- c. Formulation of Long-term Port Development Plans for UQP and KZP including conceptual designs (target year 2035).
- d. Formulation of Short-term Development Plans for UQP and KZP including preliminary designs and cost estimates (target year 2025).
- e. Overall project evaluation and recommendation.
- f. Environmental impact consideration.

15.2.2 IMPROVEMENT OF PORT MANAGEMENT AND OPERATION

As described in Chapters 9 and 10, the Iraqi port sector is facing various issues and challenges in port management and operation aspects. In order to have well modernized and efficient ports in the region, these issues and challenges need to be addressed. To achieve such target, the Study will focus on the following aspects by reviewing the present situation/issues and proposing an appropriate improvement measure respectively:

- a. Review and study the institutional system of the port sector including GCPI's organizational structure.
- b. Review and study the port tariff system.
- c. Study the privatization strategic program for specialized terminals operation.
- d. Formulation of the port management improvement plan including measures to be compliant with ISPS code.
- e. Formulation of the port operation improvement plan including a necessary study on computerization and EDI system.
- f. Study on the strategic capacity building plan taking into account the on-going or planned capacity building schemes by donor countries and by own budget.

15.2.3 CAPACITY BUILDING PLAN

Based on the study results of the strategic capacity building plan, a detailed capacity building plan will be prepared as discussed with GCPI. It will be finalized as a capacity building program, by which its implementation methodologies are defined and divided into the scope covered under the Study or by other donor countries.

Table 15.4 Proposed Subjects of Capacity Building Plan and Implementation Methods

Target Recipient	Subject/ Theme	Implementation Method
D. Responsible Persons of GCPI, related Ministries	(Institutional and Organizational Improvement) 4. Port Management & Operation and Budget & Financial aspects 5. Policies on International organizations & Regulations 6. Privatization/PPP System/Policy	<ul style="list-style-type: none"> - Study and survey on other countries' system, modern ports. - JICA's workshop/Experts dispatch program - Workshop program by other donor countries or dedicated international organizations.
E. Management and Key Person of Responsible dept./section	(Port M&O system/method Improvement) 8. Project and Equipment procurement implementation & control ability 9. Demand forecast, Development planning 10. Port Facilities maintenance & control 11. Equipment maintenance & control 12. Environment protection, Safety 13. Budget & Financial aspects control 14. Capacity Building of Staff	(Training of responsible/key persons, trainers is effective) <ul style="list-style-type: none"> - Upgrading/improvement of skills/knowledge through JICA training course. - Technology transfer through implementation of projects, studies under JICA. - Training by sub-contracted specialist firms. - By providing facilities for survey/monitoring/inspection (Environment Unit) - Enhancement of GCPI Training Center.
F. Persons in Charge, Operation Staff	(Upgrading of Individual skills and ability) 5. Facilities/Equipment operation skills 6. Facilities/Equipment maintenance skills 7. Systems running/operating skills 8. Environment protection/ operation safety skills	<ul style="list-style-type: none"> - System suppliers training by contract. - Equipment suppliers training program by contract. - Third Country Training - Training at GCPI Training Center.

The abovementioned Subjects/ Themes are to be further divided into more specific items in finalizing the Implementation Plan. It will however be necessary to further study and re-confirm the above needs before the preparation of the Implementation plan, since some themes/items may be under on-going status being arranged by GCPI or on a list for the planned program by JICA or other international organizations.

15.2.4 RECOMMENDATION ON THE IMPLEMENTATION SCHEME FOR THE PORT SECTOR DEVELOPMENT STUDY

The Government of Iraq through its implementing ministry requested the Japanese government for the implementation of Port Master Plan Study under the Japan's technical cooperation scheme as essentially important and urgent.

Considering the abovementioned expected scope of the Port Sector Development Study that contains various study aspects, it is recommended to implement the Study by utilizing a **Project Based Technical Cooperation Scheme** as appropriate.