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PROJECT COMPLETION REPORT

KOREA

PUSAN PORT PROJECT
(LOAN 2726-KO)

AUGUST 24, 1993

MICROGRAPHICS

Report No: 12277
Type: PCR

Infrastructure Operations Division
Country Department I
East Asia and Pacific Region

CURRENCY EQUIVALENTS

Currency Unit	=	Won (W)
US$ 1.00 (SAR)	=	W 900 (as of April 1986)
US$ 1.00	=	W 778 (as of September 1992)
US$ 0.001	=	W 1

FISCAL YEAR

January 1-December 31

WEIGHTS AND MEASURES

1 meter (m)	=	3.2808 feet (ft)
1 kilometer (km)	=	0.62 mile (mi)
1 square kilometer (km2)	=	0.3861 square miles (sq.mi)
1 hectare (ha)	=	0.01 km2 = 2.4711 acres (ac)
1 kilogram (kg)	=	2.2046 pounds (lbs)
1 metric ton (m ton)	=	1,000 kilograms (kg) or 2,240 pounds (lbs)
1 revenue ton (rt)	=	on average approximately 600 kg or 1322.4 lb.

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

ADB	-	Asian Development Bank
CFS	-	Container Freight Station
CY	-	Container Yard
DMPA	-	District Maritime and Port Authority
EIRR	-	Economic Internal Rate of Return
EPB	-	Economic Planning Board
GNP	-	Gross National Product
GOK	-	Government of Korea
GRP	-	Gross Regional Product
ICB	-	International Competitive Bidding
ICD	-	Inland Container Depot
KCTA	-	Korea Container Terminal Authority
KMI	-	Korea Maritime Institute
KMPA	-	Korean Maritime and Port Administration
KNR	-	Korean National Railroad
MIS	-	Management Information Systems
MOT	-	Ministry of Transportation
ODCY	-	Off-Dock Container Yard
PCTOC	-	Pusan Container Terminal Operating Company
PDMPA	-	Pusan District Maritime and Port Authority
PECT	-	Pusan East Container Terminal
PPCO	-	Pusan Port Construction Office
SAR	-	Staff Appraisal Report
TEU	-	Twenty Foot Container Equivalent Unit

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

August 24, 1993

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on Korea
Pusan Port Project (Loan 2726-KO)

Attached is the "Project Completion Report on Korea -- Pusan Port Project (Loan 2726-KO)" prepared by the East Asia and Pacific Region. Part II contains the Borrower's comments. Loan 2260-KO (US$141 million equivalent of June 1986) was to help increase efficiency of container handling operations in the Pusan-Seoul Corridor. This would be accomplished through a port project planned for completion by end-1990. Shortly after the Loan became effective, Government said it preferred to use its own funds and requested cancellation of most of the technical assistance component included in the Loan; this led to the cancellation of US$6.5 million on October 29, 1986.

Except for problems with land acquisition, which resulted in one year's delay in project completion, implementation proceeded smoothly. Installations and equipment for efficient handling of containers in the Port of Pusan were procured. Congestion in the city of Pusan was reduced considerably through the provision of sufficient stacking space in the port area, thereby eliminating the need for off-dock container storage. The inland container transportation system has been improved, including the utilization of railroad facilities. Management and financial control over port activities has been further improved. Overall the project is rated as satisfactory, its sustainability as likely, and its institutional impact as substantial.

The PCR is comprehensive and summarizes adequately the experience gained from project inception to completion. No audit is planned.

KOREA
PUSAN PORT PROJECT
(LOAN 2726-KO)

PROJECT COMPLETION REPORT

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PROJECT COMPLETION REPORT

Preface

This is the Project Completion Report (PCR) for the Pusan Port Project in Korea, for which Loan 2726-KO, in the amount of US$ 141 million equivalent was approved on June 23, 1986. The loan closed on December 31, 1992. Disbursements under the loan totaled US$ 134.5 million, with final disbursements made on January 15, 1992. US$ 6.5 million was canceled effective October 29, 1986.

The PCR was jointly prepared by the Infrastructure Division of the Asia Technical Department (ASTIN), the Infrastructure Operations Division (EA1IN), Country Department I, of the East Asia and Pacific Region and the Borrower, and is based, inter alia, on the Staff Appraisal Report (SAR), the Loan Agreement, supervision reports, the Borrower's own records, correspondence between the Bank and the Borrower, and internal Bank memoranda.

KOREA
PUSAN PORT PROJECT
(LOAN 2726-KO)

PROJECT COMPLETION REPORT

Evaluation Summary

Objectives

The main objectives of the Project were to: (a) provide installations and equipment for efficient handling of container traffic; (b) reduce congestion in the city of Pusan by providing sufficient container stacking space in the port area thus largely eliminating the need for off-dock container storage; (c) increase efficiency of existing and proposed container handling facilities and the inland container transportation system, including the utilization of railroad facilities; and (d) further improve KMPA's and PCTOC's management and financial control over port activities.

Implementation Experience

Implementation of the civil works component has generally progressed satisfactorily. There were also no problems with procurement. Smooth implementation was however interrupted by: (a) problems associated with land acquisition and the relocation of resident fisherman, villagers and kelp divers, and (b) budgetary constraints resulting in large part from compensation to the affected residents. These problems caused some delay in project execution and resulted in a one year delay in project completion. The problem originated with the understanding, at the time of appraisal, that since the fishermen and villagers were squatters, with no legal title to the land, the government would, as in the past, simply evict them as trespassers. However, a change in government in 1988 brought about a change in attitude concerning compensation for expropriated land and relocation of affected residents.

The other main project component was the implementation of two Action Plans. The first focused on operational issues within the Korean Maritime Port Authority (KMPA) and the Korean National Railroad (KNR), and dealt specifically with increasing the utilization of Container Yards (CYs) and Container Freight Stations (CFS) as well as improved access and inland movement of containers. The second focused on financial and management issues, in particular commercial and cost accounting, management information systems

(MIS) and construction supervision. KMPA and KNR were responsible for the implementation of those components relevant to their individual operations. The Government of Korea (GOK) however canceled most of the technical assistance portion of the Bank loan which included the two Action Plans, within a month of loan effectiveness, although implementation continued with domestic financing. The Bank participated in and provided comments on most of the components of the two Action Plans, but it had little influence on the outcome of the Action Plans with the result that some of the components are still to be implemented.

Sustainability

The project is sustainable due to forecasted increases in container traffic. The outstanding issue concerns the need to eliminate the Off-Dock Container Yards (ODCY) located throughout the city of Pusan. It is expected however that this issue will be resolved by 1995, with the construction of the Yangsan Inland Container Depot (ICD) which is located about 20 km from the port and outside Pusan City. The decision to construct the ICD was the result of comments made by the Bank on one of the studies conducted as part of the Project.

Findings and Lessons Learned

A number of the findings and lessons learned are similar to those raised in other PCRs prepared for infrastructure projects in Korea, and include the following:

(a) Cost-underruns have become normal in Bank projects in Korea. International costs, as estimated in Bank appraisals, are not necessarily reflective of project costs in this country. Local conditions need to be more fully taken into account in countries like Korea which have highly competitive industries;

(b) Korean agencies, like KMPA, are quite capable of implementing project components which are within their immediate control. Those outside their jurisdiction are more difficult, especially where coordination and cooperation with other agencies is involved;

(c) acquisition of private land and compensation of residents in Korea, especially for public projects, has become very difficult and expensive. It often prolongs project implementation, incurs costly

delays, and makes it virtually impossible to accurately forecast the required budgetary allocation for land purchase and compensation. It may be necessary to introduce a level of public participation in decisions relating to large infrastructure projects to ensure timely implementation of project components which directly affect the public;

Those more specific to the Pusan Port Project focus on environmental issues and include:

(a) growth in container traffic will continue in the foreseeable future. Because of difficulties in accurately predicting growth levels port expansion will also continue to lag behind demand. This affects not only the port but also traffic in and around the city. More cooperation between the port and the city is required to effectively deal with demand and supply issues emanating from port traffic, and in particular with growth impacts on the physical and social environments, as either one or the other, or both, will be affected;

(b) Bank missions must be prepared to ask focused questions to draw out relevant environmental and resettlement information, because the Government may not voluntarily supply required information, as it may not be fully attuned to the Bank's needs. The extent of the removal and compensation requirements for affected fishermen, villagers and divers in projects such as this one, would as a result be more accurate; and

(c) KMPA was not as sensitive to both the social and environmental impacts of the project during project preparation and implementation as it is at the present time. The project has made KMPA more aware of these issues. Nevertheless, there is still a need for KMPA to further develop an appropriate level of sensitivity.

KOREA
PUSAN PORT PROJECT
(LOAN 2726-KO)

PROJECT COMPLETION REPORT

PART I: BANK'S REVIEW

1. Summary Project Data

Project Name	: Pusan Port Project		
Loan Number	: 2726-KO		
RVP Unit	: East Asia and Pacific		
Country	: Korea	Loan Amount	: US$141.0m
Sector	: Transport	Canceled Amount	: US$ 6.5m
Subsector	: Ports	Disbursed Amount	: US$134.5m
Approval Date	: 6/23/86	Staff Appraisal	: October/85
Effective Date	: 11/04/86		
Completion Date	: 12/31/92	Total Project Cost	: US$ 261m
Loan Closing	: 12/31/92		
Appraisal ERR	: 35%	Re-assessed ERR	: 39%

2. Background and Sectoral Information

Appraisal Context

2.1 In 1986, when the Pusan Port Project was appraised, the population of Korea was about 40 million, growing at an annual rate of 1.7%. Almost 60% of this population lived in urban areas, with Seoul being the largest city and Pusan the second largest in the country. By 1991 the total population of Korea had grown to 43 million, with the urban proportion rising to 72%. Although the overall population is projected to grow at less than 1% in the future, urban growth is expected to continue at a much faster rate (around 3% annually).

2.2 In terms of the Korean economy, the 1980s saw some fluctuation in growth. For example, in 1985 the GNP growth rate had dropped to about 5% after experiencing an annual average growth of around 10% from 1982. After taking on a new vigor in 1987 when a 12% growth was registered, by 1991 growth had stabilized at 8.4% with the economy now projected to grow between 1992-96 at an annual rate of 7.5%.

2.3 Throughout much of the 20 years preceding the project, the transport system had been strained by the demands of rapid growth. Massive public investments in infrastructure had been made to keep up with economic growth. Between 1967 and 1977 the Government had allocated up to 23% of its total annual capital expenditure budget to expand and modernize transport infrastructure, 15% between 1977-86 and 12% between 1986-91.

2.4 The importance of Pusan Port as a major Korean port, and its focus as Korea's main container port, had already been established during the early 1980s. The GOK had made a concentrated effort to encourage the development of new industrial complexes in coastal areas to take advantage of Korea's natural potential in harbors, and to exploit low-cost coastal shipping while attempting to avoid excessive congestion on road and rail. The Government's main goals for the transport sector under the Fifth Five-Year Plan (1982-1986) were to: (a) selectively increase transport capacity by modernizing equipment and optimizing investments in the sector, (b) enhance transport efficiency by improving intermodal traffic allocation and conserving energy; and (c) strengthen maintenance activities. The Bank's focus during this period, which was in part influenced by the Transport Sector Issues Survey Report (No.4423-KO dated 12/27/83), was on improving the productivity of existing facilities and improvement of infrastructure, particularly; (a) planning, (b) regulation and pricing, and (c) energy conservation. In the port/shipping subsector, a number of sector specific reviews had been carried out by the Bank. These included: (a) A Survey on the Prospects and Strategy for the Development of the Korean Shipping Industry (January, 1985); (b) A Sector Report on Planning for Fishing Port Development (March, 1986); and (c) A Sector Report on Container Port Regional Selection and Regional Development (March, 1986).

2.5 In the Government's Seventh Five-Year Plan (1992-1996), the GOK's focus in infrastructure has not altered significantly from previous years. The main areas of concentration continue to include relief of congestion on the Seoul-Pusan corridor by expanding the transport facilities in the Seoul Metro Region, rationalization of transport demand between Seoul and other regional centers by making the regions economically self-sufficient, development of inland container depots in the Seoul and Pusan areas for efficient handling of container cargo, and development of industrial sites close to port facilities to minimize transport movement. It also focuses attention on the promotion of rail over road transport on the major trunk routes, giving priority to development of mass transport networks to serve both regional and urban transport, and strengthening the multimodal transport network for passenger and freight transport.

Seoul-Pusan Corridor

2.6 The Seoul-Pusan Corridor contains some of the largest urban areas in Korea: Seoul, Pusan, Daegu and Daejon. In 1985 the population of these cities totaled 16 million (9.6 million, 3.5 million, 2.0 million and less than 1 million, respectively). By 1991 this population had grown to almost 23

million (11 million, 4 million, 3 million and 1.2 million, respectively). This excludes the population of the many smaller urban areas also found in this corridor. Along with now accounting for over 50% of Korea's population (compared to 40% in 1986), this area also accounts for about 80% of the country's GNP (compared to 70% in 1985).

2.7 At the time of appraisal the main objective of the Government's long-term land use plan was to seek a more balanced and decentralized development on the basis of integrated regional settlement areas. However, two of the three primary growth centers, and two of the twelve secondary centers included in the plan, were located in the Seoul-Pusan Corridor. As a result, in the eleven years from 1971 to 1982, passenger traffic in the corridor nearly tripled. To accommodate this growth, an expressway was constructed from Seoul to Pusan and the rail service upgraded in the corridor to increase capacity and augment efficiency. Both passenger and freight traffic has continued to increase significantly in the Corridor, and coupled with the continued growth of the urban areas in it, has made the Corridor the prime network for Korean passenger and freight traffic.

Pusan City and Pusan Port

2.8 In 1985 the population of the city of Pusan was 3.5 million. Although growth has been slow, reaching almost 4 million in 1991, geographically it has grown significantly, increasing from a total land area of 373 square km in the 1970s to 529 square km by 1991. In 1986 the Gross Regional Product (GRP) for Pusan was registered at Won 7 trillion, with an annual growth rate of 6.6% recorded between 1980-1986. At that time the service industry accounted for about 63% of the GRP and manufacturing about 34%. Although there are no official GRP statistics for Pusan in the period 1987-1991, it is known that the manufacturing sector alone has almost doubled in its output during that time period.

2.9 The Port of Pusan, located in the city of Pusan, is Korea's largest port. Its expansion has supported the on-going industrialization of the country with its imports of raw materials and industrial goods and export of manufactured products. The growth of container traffic from 384,000 TEUs in 1976 to 1.1 million in 1984 and 2.4 million in 1991 is also partially the result of the increased rate of containerization of Korea's imports and exports. Pusan Port handles container traffic for the Pusan area as well as the Seoul and Daegu/ Daejon regions, all of which are located in the Seoul-Pusan Corridor. In 1991, for example, of the 2.4 million TEUs handled at the port, 36% remained in Pusan, another 52% were transported to Seoul and its regions, with the remaining 12%

going to either the Daegu or Daejon areas in the Seoul-Pusan corridor. This traffic split between Pusan, Seoul and the Daegu/Daejon region is however expected to change in the future, with Pusan accounting for about 28% of the port and container traffic by the year 2001, the Daegu/Daejon region about 26% and Seoul 45%.

2.10 Container movement from Pusan to Seoul has traditionally gone by either road or rail with road accounting for the largest share (72%) in 1987. In 1991, the modal split was similar, with road accounting for the movement of about 70% of container traffic, rail about 28% and coastal shipping only 2%.

2.11 A number of alternate sites to locate further container facilities were investigated under the Phase III Port Development Study carried out in 1982. Although the Study recommended that future port expansion continue to take place at Pusan, a subsequent study, although concurring with the plans to proceed with expansion of Pusan Port as a container port, also recommended the development of Kwang-Yang Bay, located some 150 km west of Pusan on Korea's southern coast, as an alternative container port.

3. Previous Bank Involvement

3.1 In ports, Bank assistance has been directed at the modernization and expansion of facilities to support Korea's export-led development. Containerization was introduced at Pusan under two previous port projects (Loans 917-KO/1401-KO) and was developed further under the present project, where the Bank supported government policy measures to increase the efficiency of container handling, and further strengthened KMPA's progress in institution building, through improvements in management and financial accountability.

3.2 A Project Performance Audit Report (PPAR - No. 5756) was prepared on the First and Second Port Projects in June 1985. The First Port Project, which was approved in June 1973, provided US$80.0 million for the development of coal and cement berths at Mukho Port as well as a two berth container terminal at Pusan. It also provided the framework for a reorganization of all Korean ports, the establishment of KMPA and extensive institution building. This project was satisfactorily completed in August 1979. The Second Port Project, approved in April 1977 provided US$67.0 million for another two-berth expansion to the container facility at Pusan and continued institution building within KMPA. Completion of this latter project in March 1983 enabled Pusan Port to implement an effective containerization program attracting mainline ships by reducing handling costs and expediting the flow of cargo.

3.3 Among the main findings highlighted in the report were the following: (a) it is difficult to accurately project traffic in an environment of rapid growth as found in Korea; (b) when creating, or assisting in the creation of institutions, detailed operating plans for the facilities should be developed to ensure smooth implementation; and (c) institutional changes require the commitment of Government, and to attain that commitment there must be a clear understanding by both the Bank and the Government of what the requirements are and what can realistically be achieved.

3.4 The design of the two Action Plans included under the Pusan Port Project were developed as a direct result of the need to address the issues noted above. Institutional development issues, specifically the improvement of KMPA's financial and management functions were addressed, as were intermodal issues which focused on improvements in utilization of the rail terminal in the port, container yards, container freight stations and inland container handling operations throughout Korea. This was accomplished by mapping out detailed steps and actions which were used to monitor and guide the process. The container handling actions were aimed specifically at defining more clearly the steps and actions required to improve the rules and procedures now governing the usage of these facilities.

4. Follow-on Initiatives

4.1 The Port of Pusan began construction on Phase IV in 1992 and it is scheduled to be completed in 1995. The designs for Phase IV were developed by KMPA with the assistance of consultants financed by the Government during the implementation of this Project and benefits from the construction of the breakwaters and infrastructure components which were financed by the Bank under the present loan. In an attempt to accommodate increased container traffic before congestion reaches a critical stage, a total of four new berths are being constructed, with a quay length of 1400 meters. The total cost of this package is estimated to be about Won 350 billion with financing provided by the Government.

4.2 In addition, the GOK is in the process of discussing, with the Bank, still further development of Pusan Port, to accommodate projected container traffic beyond the year 2000. The proposed project, which is scheduled for appraisal by the Bank in FY94 will address not only the issue of increased capacity and efficiency, but will also focus on environmental issues including the environmental impact of port development and the introduction of ship waste disposal facilities in the main ports of Korea. The specific objectives

of the proposed Pusan Port Development and Environmental Project include:

(a) improvement of the urban and marine environment by providing pilot ship waste disposal facilities at several of Korea's major ports in an effort to reduce the pollution of international and coastal waters caused by ships discharging their wastes;

(b) reduction of the accident risk at the ports of Pusan and Inchon by developing and providing a Vessel Traffic Management System (VTMS); and

(c) construction of a new port at Daedapo to receive and process the timber shipments into Pusan, thus diverting heavy truck traffic away from the center of the city, and relieving it somewhat of traffic congestion and air pollution.

4.3 The proposed project will be the first in Korea to include a comprehensive Environmental Impact Assessment and an economic analysis which endeavors to quantify the main economic costs and benefits associated with its implementation.

5. The Project

Objectives

5.1 The main objectives of the Pusan Port Project included: (a) the provision and installation of equipment to increase efficient handling of container traffic; (b) reduction in city congestion caused by off-dock container storage yards by providing sufficient container stacking space in the port area; (c) increased efficiency of existing and proposed container handling facilities as well as the inland container transportation system (already part of KNR's objective under the Seoul-Pusan Corridor Project (Ln.2600-KO), which provides funds to better utilize the railroad in the corridor; and (d) improvement of KMPA's and PCTOC's management and financial control over port activities.

Description

5.2 To assist in the accomplishment of the above objectives the project included the following major components:

(a) Civil works including breakwaters, a three-berth container terminal together with ancillary facilities, and road and rail access to the terminal;

(b) Equipment for container handling as well as for improving railway line capacity, and additional tracks at PCTOC's CY; and

(c) Technical assistance to: (i) train port planners and managers; (ii) update the Master Plan for Pusan Port; (iii) carry out studies to: improve container operations and utilization of the existing Container Yards (CYs) and CFS; plan,design and implement the road access to the expressway; relocate off-dock CYs in Pusan city to the proposed on-dock CY; improve container distribution systems throughout Korea; and define management organization and operating rules for the proposed container terminal; (iv) supervise civil works and erection of equipment; and (v) study and implement measures to improve financial management in KMPA and allied organizations, including the development of a management information system and computerized accounting.

Design and Organization

5.3 The project was designed to continue Bank participation in the development of container facilities at Pusan Port. The project was implemented by KMPA (which also implemented the Bank's Second Port Project: Loan 1401-KO), with the assistance of consultants.

Revisions and Amendments

5.4 Except for the extension of the quay from 780 to 900 meters, the provision of a replacement protected anchorage for fishing boats and replacement housing for displaced villagers, there were no major revisions or amendments to the Bank-financed components, but there were a number of changes to the overall project. Specifically, additional works were contracted for the CFS building, laborer's shed and sentry posts. These additions, paid for by the Government using its own resources, increased project cost by Won 10 million. An additional container storage area, the Dongmyung Container Yard, and a new access road to by-pass the city center which linked the Terminal to the Seoul-Pusan Expressway were also constructed by KMPA utilizing GOK's own resources. The cost of these works has not been included in the project cost. Finally, the Bank financing for the studies and technical assistance included in the two Action Plans prepared under the Project were canceled within one month of loan effectiveness.

6. Project Implementation

6.1 In general, the Project's objectives were satisfactorily met (para 5.1) except that the relocation of the off-dock CYs within the city and the reduction of the traffic congestion caused by their presence, has not been accomplished due to lack of adequate space at the port. This problem is being addressed by the construction of a container storage facility at Yangsan. Implementation of the civil works components of the project (breakwaters, container terminal and related facilities, and access road and railroad link) were generally completed satisfactorily. The South Breakwater was completed at a final cost of W 31.97 billion (US$ 41.1 million), slightly below the original contract estimate of W 32.63 billion (US$ 41.9 million). The North Breakwater was completed at a final cost of W 45.28 billion (US$ 58.2 million) compared to the original contract estimate of W 44.72 million (US$ 57.5 million). Difficulties in construction were encountered when a typhoon damaged the caisson staging area for the South Breakwater, causing some delay in construction. In addition, objections to dredging activities at the sand source (used to form the foundation of the caissons), which allegedly disrupted economic activity in the area and caused ecological damage to bird nesting sites, resulted in abandonment of dredging activities and purchase of the balance of the granular fill from other on-shore sources.

6.2 The new container terminal was completed at a final cost of W 62.0 billion (US$ 79.7 million) compared to the original price estimate of W 51.04 billion (US$ 65.6 million). This included increased costs resulting from an increase in quay length and area requirements; the cost of constructing new housing and infrastructure for the resettlement of affected "mountain villagers"; construction of a small breakwater and marine site for the sheltering and berthing of displaced fishing vessels; and compensation for affected fishermen, villagers, divers and kelp collectors.

6.3 Except for one section, about 400 meters in length, where the necessary land has only recently been purchased, the road and rail link access will be completed at a final estimated cost of W 9.5 billion (US$ 12.2 million), compared to the original contract estimate of W 6.7 billion (US$ 8.6 million). Completion of construction on the remaining link is expected by June 1993.

6.4 Under the project, six 40-ton container gantry cranes were procured and installed at the container berths at a cost of W 10.5 billion (US$ 13.5 million). The cranes became operational in 1991. Another 25 container yard transfer cranes were obtained at a cost of W 11.0 billion (US$ 14.2 million)

Of these, one was erected in the rail yard and another in the reefer area, with the remainder used throughout the container yard. The cranes were operational in 1991. In addition other mobile equipment purchased under the project included 31 chassis, 51 tractors, 6 container lift trucks and 9 forklift trucks (US$ 5.71 million).

Technical Assistance

6.5 The technical assistance component included supervision of construction, updating of the port master plan and the design and implementation of two Action Plans to improve management and operational capabilities. KNR was responsible for certain components and KMPA for others. The Port Master Plan has been completed but the two Action Plans met with mixed degrees of success. The components handled by KNR have been implemented while those of KMPA are expected to be completed by 1994/95. (Refer to Annex 1: Status of Action Plans). Since most of the technical assistance component of the loan was canceled in the early stages of project, the Bank's influence in implementation of the Plans has been somewhat restricted although a continuous dialogue between the Bank and executing agencies, concerning these Action Plans, was maintained throughout project implementation.

6.6 The KMPA Action Plan, which included the following components: (a) computerization of the commercial accounting system; (b) the design and implementation of a cost accounting system; and (c) computerization of the port operations system as a first step to the introduction of a comprehensive management information system, has been only partially completed. Design and implementation of the commercial and cost accounting systems were delayed due to lack of funds. A new completion target date of late 1994 for implementation has now been set. The management information system, on the other hand has been substantially completed. In addition, a number of studies were conducted to facilitate implementation of the action plans. These were all completed. (See Annex 1)

6.7 The KNR Action Plan was intended to rationalize container transportation by increasing the speed, length and frequency of trains, improving access to Pugok as well as the utilization of the facility for all shippers, integrating Pugok and PCTOC with a computerized system, use of PCTOC to form and receive all Seoul container trains, and increase loading and unloading efficiency through equipment purchase at both Pugok and PCTOC. The main components of this Action Plan have been implemented successfully. (See Annex 1 for a detailed description of the implementation of both Action Plans)

Procurement

6.8 The Project civil works were divided into four contract packages, the South Breakwater, the Container Terminal & Related Facilities, the North Breakwater and the Access Road & Railroad. All were let successfully under International Competitive Bidding (ICB) in accordance with Bank guidelines. However, due to price competition by Korea's very competent and sophisticated construction sector, all contracts were won by domestic construction companies. The contract for Project No. 1 - South Breakwater was awarded to the Hyundai Engineering and Construction Co., Ltd. on August 19, 1986 for a bid price of Won 32,632,800 million. Work commenced in August 1986 and was completed in November 1989 as scheduled. The total cost as completed was Won 31,966,654 million. The contract for Project No. 2 - Container Terminal and Related Facilities was awarded to the joint venture of Ssangyong Construction Co., Ltd. and Dongah Construction Industries Co., Ltd. on April 20, 1987 for a bid price of Won 51,039,000 million. Work commenced in April 1987 and was substantially completed in December 1991, with only the CFS remaining. It was completed in February 1992. The total cost as completed was Won 61,991,106 million, with the increase due partly to increases in the scope of works and to price escalation during the construction period. The contract for Project No. 3 - Access Road and Railroad was awarded to the Ssangyong Construction Co., Ltd. on September 28, 1988 for a bid price of Won 6,704,720 million. Work commenced on September 30, 1988 and is still on-going, with completion expected in June 1993. The total cost as completed is estimated to be Won 9,503,047 million, a 42% cost increase from the contract price primarily due to a major increase in the scope of work coupled with price escalation during the period of construction. The contract for Project No. 4 - North Breakwater was awarded to the joint venture of Daewoo Corporation, Ltd., Samsung Construction Company, Ltd., and Lymkwang Construction Company, Ltd. on December 29, 1986 for a bid price of Won 44,715,952 million. Work commenced in February 1987 and was completed in November 1990, as scheduled. The total cost as completed was Won 45,281,701 million including price escalation during the period of construction. All procurement of civil works was carried out smoothly without maj problems, except for the delays experienced due to th difficulties described in para 7.2 below.

6.9 Supply and installation of six container gantry cranes was tendered under ICB with the contract awarded on December 20, 1988 to the joint venture of Korea Heavy Industries and Construction Co., Ltd. (Korean) and Liftech Inc. (USA) for a bid price of Won 8,462,388 million plus

US$ 2,684,000. Work began in January 1989 and was completed by the end of April 1991. Supply and installation of 25 container yard transfer cranes was tendered under ICB with the contract awarded on December 20, 1988 to the joint venture between Samsung Shipbuilding and Heavy Industries Company, Ltd. (Korea) and Sumitomo Heavy Industries Company, (Japan) for a bid price of Won 9,459,010 million plus US$ 2,058,170. Work began in January 1989 and was completed in April 1991. Procurement of mobile equipment for container handling was carried out through Korea's Office of Supply (OSROK) using ICB procedures beginning in October 1990. In this way, 121 yard chassis were supplied by Hyundai Precision Industries Company, Ltd. (Korea), and 10 other, larger yard chassis were supplied by Jindo Corporation, Ltd. (Japan). In addition, 51 yard tractors were supplied by Mid-Pacific Industries, Inc. (USA), nine small and medium forklift trucks were supplied by Samsung Shipbuilding and Heavy Industries Co., Ltd. (Korea), one light-duty container lift truck was supplied by the Hyster Company, Ltd. (Australia), three medium-duty container lift trucks were supplied by Boss Truck Limited (UK) and two heavy-duty container lift trucks were supplied by the Hyco Company (Italy). The total cost of all the mobile equipment was US$ 5,706,167 with supply and delivery completed during May 1991. All equipment was procured without significant problems.

Costs

6.10 Because of aggressive domestic bidding on the civil works contracts, the costs for implementation of this component was less than 60% of the original appraisal estimate. However, land acquisition/compensation costs had not been included in the Bank's appraisal estimates, actual resultant costs were about 67% of the appraisal estimate. In addition, with the Won growing in strength during project implementation, the proportion of equivalent dollars required also grew.

Consulting Services and Training

6.11 The consultants responsible for construction supervision of the civil works, Korean Engineering Consultants Company (KECC), provided excellent service to the project. The costs of these consulting services were defrayed by the Government from their own resources. These same consultants, with their U.S. counterparts provided services for all of the construction phases of Pusan Port, from the first phase to the present one. In the first port project the U.S. company, Lyons Associates, was the lead consulting firm, in the second there was a joint partnership between Lyons and KECC, while in the third (present) project KECC became the lead firm using a different U.S. firm to provide only specialized expertise. The

arrangement worked very well with the Korean firm becoming extremely competent in the field by the third project.

6.12 During project implementation three KMPA staff were given full scholarships to attend a one year masters program in the U.S. All three successfully completed their terms and returned to work in KMPA. A number of KMPA staff and managers also visited several ports in the U.S. as part of a training program to learn more about port development and operations. In addition, other staff of KMPA and EPB studied in the Netherlands, UK and Japan for varying periods. The foreign component of these training costs was financed by the Bank under this Project.

6.13 Disbursement experience on this Project was generally positive. There was a substantial lag during the early part of the project implementation period which, however, was overcome as early delays gave way to better progress in project execution.

7. Project Results and Lessons Learned

Project Results

7.1 Implementation of the civil works components of the project generally progressed satisfactorily. Competition for the construction of the civil works was very intense, with the result that the cost of the civil works was 27% below appraisal estimates despite some increase in the scope of works. Smooth implementation was, however, interrupted by: (a) problems associated with land acquisition and the removal of resident fishermen, villagers and women divers, and (b) budgetary constraints, resulting in large part from compensation to affected residents. These problems caused some delay in project execution and resulted in a one year delay in project completion, from December 1991 to December 1992. In terms of land acquisition and compensation, at the time of appraisal, no cost estimates were prepared, either by KMPA or the Bank. This is because it had been assumed that since those people on the affected property were squatters, with no legal title to the land, the government would be able, as it had in the past, to simply evict them as trespassers. However, with the change in government in 1988, and an attempt to exhibit more social consciousness, the new government decided to compensate the inhabitants for lost income and resettle them in new housing provided by the state. In addition, market prices were to be paid for expropriated land. Differences in opinion concerning land values forced a number of cases to be settled by the courts. This resulted in a one-year delay in the civil works component and a two-year delay in the construction of the rail link. At the time of this writing the

last segment of the rail link from the new terminal to PCTOC, has not been completed although the necessary land has finally been purchased, with the rail link now scheduled for completion by the end of June 1993.

7.2 In terms of operations, the average handling rate of the new container cranes is less than 20 moves per hour at the new terminal (it is 17 per hour at the Phase II Terminal). The cranes purchased have a maximum practical operational rate of about 24 to 27 moves per hour. It is expected however, that with further training and the purchase of more chassis, this rate can easily reach 24 moves per hour.

7.3 In terms of administrative structure, the present three-tier system, with container yard operators reporting to KCTA, which in turn reports to KMPA, needs further rationalization and enforcement of lines of authority. Little cooperation or communication appears to take place between PCTOC and KCTA, on the one hand, and between KCTA and KMPA on the other. The situation, however, does not appear to apply to the interaction between the operator of the new terminal, PECT, and KCTA. This issue is to be addressed as part of the proposed Ports Development and Environmental Improvement Project.

Technical Assistance and Training

7.4 At the Government's request, the Bank financing for the studies, technical assistance and the Action Plans that were contemplated during appraisal and included in the Project was canceled soon after the Loan became effective, the Government stating that it wished to provide the funds needed for these components itself from its own resources. The only exception to this arrangement involved the costs of the services of expatriate technical assistance experts who assisted KMI in carrying out the study of KNR's container operations, which were financed out of the proceeds of the Loan. The Training Program was successfully carried out with financing by the Bank from the proceeds of the Loan.

Action Plans

7.5 The Action Plans included under the project have not been fully implemented. The main shortfalls concerned relocation of the off-dock CYs and the introduction of both commercial and cost accounting. The problem with relocating the CYs appears to have stemmed from the fact that there continued to be a need for these facilities. KMI had been contracted to study the relocation of off-dock CYs under the KMPA Action Plan. Their report concluded that the yard could not be eliminated until such time as sufficient space was

allocated elsewhere. As a result there was little to no pressure placed on the off-dock owners to relocate nor few incentives offered for them to do so, by either the city, the customs officials or the port authority. With rising pressure from the public, due to increased congestion and pollution resulting from off-dock activities in the city, and the construction of an alternative location at Yangsan, the prospect for relocating these facilities in the near future appears to be better. The Master Plan for Pusan Port was completed in 1990, with master plans for the city of Pusan as well as Kwangyang Bay also completed. These plans are expected to provide more accurate information concerning proposed future investments, allowing for decision makers to the more appropriately analyze options. With respect to the introduction of a commercial cost accounting system, the Economic Planning Board (EPB) has decided to postpone this component due to budgetary limitations. With respect to cost accounting, the work has been redirected towards implementation at the headquarters level and not the terminal level (operating companies) as originally envisaged, with final implementation now postponed to 1996.

7.6 In so far as KNR was concerned, the main objectives of their action plan have been met. The speed and frequency of trains between Seoul and Pusan has increased to 12 trains per day, operating at 90 km per hour, with the number of container cars also increasing from 18 to 22 daily. Access to the rail terminal at Pugok has been improved with the container yard now open to all capable shippers (presently a total of 18). The Bank's Kyonggi Regional Transportation Project (Loan 2905-KO), which included the construction of a four-lane toll expressway between Shingal-Panwol as one of its components, linked Pugok to the national expressway network which made it more accessible. Also, the utilization of the PCTOC rail terminal at Pusan has increased by 40% under the action plan, to 78%. Finally the length of container trains has also been increased as has the efficiency of loading and unloading equipment. What is still missing, however, is an integrated computerized system linking the Pugok container terminal near Seoul with PCTOC at Pusan. Implementation of this component was envisioned under the Bank's (postponed) Railroad Systems Modernization Project (refer to Annex 1).

Economic Analysis

7.7 The Bank neglected to include, in its cost estimates, any indication of funding estimates for land acquisition and compensation. This somewhat distorted the resultant economic internal rate of return (EIRR). Assuming that this estimate would have been about 40% below actual cost (which was the case in the Kyonggi Regional Transport Project:

Loan 2905-KO, which was implemented during the same time period as the Pusan Port Project, and for which a PCR was completed in December 1992), the appraisal EIRR would have been 29% instead of 35%.

7.8 At the time of appraisal in 1985, container traffic in Pusan Port was projected by KMPA and KMI to increase at a rate of about 7% annually. A reassessed projection, made by KMPA and KMI in 1990 on the basis of anticipated commodity flows, shows a more modest growth rate of 4% per year. On the other hand, the SAR projected base traffic for determination of economic benefits which formed the basis for the economic analysis during appraisal was 1.8 million TEUs in 1990 and 1.9 million TEUs in 1991. The latter figure was about 28% below the actual 1991 traffic of 2.4 million TEUs. The lower growth rate of 4%, applied to the much larger base traffic amount of 2.4 million TEUs, has a greater impact on projected traffic values than does the higher growth rate of 7% applied to the lower base of 1.9 million TEUs. The forecast using the 4% growth rate leads to an anticipated level of 5 million TEUs for Pusan Port in the year 2011 compared to the appraisal forecast of 3.7 million TEUs. The increase from the anticipated 1.9 million TEUs to the actual 2.4 million TEUs in 1991 occurred despite the cancellation, by a number of liners, of their container delivery schedules because of the increased waiting times for berths in the port and a slight downturn in the Korean economy in 1991 (8.4% GNP growth). However, with the strengthening of the Korean economy in 1992, and the opening of the container facilities constructed under this Project (PECT - Phase III) in 1992, the number of liners calling at Pusan Port is expected to increase to previous levels and above. The 4% rate of growth forecast for containers, therefore, appears to be reasonable. Even with this slight reversal of fortune, the recalculated EIRR is impressive, being 39% compared to 35% at appraisal. In recalculating the EIRR, the quantifiable benefits attributed to the Project at the time of appraisal were used as the basis for analysis. These included savings in cargo handling costs, ship's waiting time and service time.

Financial Status

7.9 Between 1983 and 1985 Pusan Port had experienced a steadily improving financial situation, in terms of operating revenues, net income and return on assets. This was due primarily to a significant increase in containerized cargo partly due to conversion of breakbulk general cargo. This performance was expected to continue over the long term due to the favorable combination of continued traffic growth and greater productivity. In the SAR (para 6.05) average annual traffic growth for all traffic (including containers,

breakbulk, and bulk commodities) was projected to increase between 7-8.5% with tariffs increased only to cover inflation. However, the results in recent years have not been as positive as projected. Total operating revenues have fallen dramatically since 1989 while operating expenses continued to climb, with the result that the net operating income in 1991 was about half that projected at the time of appraisal. The main reason for this is that with increased congestion at the port, traffic began to divert to other locations in 1990 and continued to drop even further in 1991 (para. 7.8). This was mainly due to decline of general cargo (oil, iron ore and machinery). There were improvements in 1992, but it is not expected that a full recovery will be realized for another year or two.

Lessons Learned

7.10 The following outlines the findings and lessons learned from the Bank's involvement in the Pusan Port Project. Many of the points raised are similar to those highlighted in other PCRs recently prepared for Bank infrastructure projects (for example, the Kyonggi Regional Transport Project: Loan 2905-KO, the Seoul Urban transportation Project: Loan 2514-KO and the Seoul-Pusan Corridor Project: Loan 2600-KO), which were implemented in Korea during the same time period. Those which mirror other PCRs include the following:

(a) Cost under-runs have become normal in Korea. International costs, as estimated in Bank appraisals are not necessarily reflective of project costs. More attention is necessary, in the case of countries with competitive industries, to take local conditions into full consideration;

(b) Korean agencies, like KMPA, are quite capable to deal with activities which are within their immediate control. Under these circumstances they are able to make significant changes. However, activities outside of their immediate control are more difficult to change, especially in those situations where the co-ordination and co-operation of other agencies or ministries is necessary for success; and

(c) The acquisition, or expropriation, of private land has become very difficult and very expensive in Korea. Although the government is allowed, by law, to expropriate land for development purposes, compensation has become very costly and often must be decided in the courts (as in this case). This prolongs project implementation and incurs costly

delays. It also makes it difficult to appropriately forecast required budgetary allocations for land acquisition. Korean society may have reached the stage where the introduction of a level of public participation in the decision-making process would be appropriate.

7.11 Other findings and lessons which are unique to this project focus mainly on environmental issues and include:

(a) Future development of the Port of Pusan will be difficult as any expansion will impact either residents or the environment, or both. Since the port is surrounded by the city, expansion on land will involve the relocation of business and/or residents; if the port elects to expand on water (reclamation), environmental impacts will require judicious monitoring;

(b) In project preparation, in addition to visiting the site, more attention needs to be paid to potential impacts, and more focused questions asked to draw out relevant environmental and resettlement information. The Borrower cannot be expected to know the level of precision required by the Bank for its analysis, and the Bank cannot depend exclusively on the Borrower to provide all relevant information without guidance;

(c) During project preparation KMPA was generally not as sensitive to potential social and environmental impacts of the project as it presently is. However, as a result of its implementation, their level of awareness has significantly increased, especially in terms of impact on project costs and time schedules; and

(d) It has taken the Bank some time to determine the significance of the difference between types of civil servants in the Korean government bureaucracy. These differences can prove to be important in the realization of certain budgetary goals and implementation of envisaged action plans. For example, in the present case the differences in stature between staff of KMPA, who are considered full civil servants, and PCTOC and KCTA, who are considered employees of government corporations and not full civil servants, were significant.

8. Sustainability/Remaining Issues

8.1 With container traffic in Pusan expected to increase at a steady rate (about 4% annually) the port should maintain or even exceed the forecast level of net benefits throughout its economic life. As ultimate success of the project depends on the continued growth of the Korean economy, and the economy is projected to grow at 7.5% annually for the next few years, and projected container traffic nationwide is expected to grow 8% annually during that period, the project is considered to be sustainable. The only outstanding issue concerns more efficient use of the port's container yard, as well as the new yard at Yangsan. However, it is expected that the problems encountered presently in the port CY and ODCYs will be greatly relieved with the construction of this Yangsan facility, which is expected to be operational by 1995.

9. Bank Performance

9.1 The overall success of the project can be attributed in part to the good performance by Bank staff during the entire project cycle. The Bank provided continuity in its involvement, with a minimum of staff changes, and regular supervision.

9.2 Where Bank performance did not meet expectation was in the appraisal of certain aspects of the project. There appears to have been little investigation of the social impact of the project, specifically as concerns resettlement, including land acquisition and compensation. Although the appraisal does refer to fishermen impacted by port expansion, there is no discussion of the villagers (about 2000), or kelp divers, who were also affected. In addition, no land acquisition or compensation costs were factored into either the project cost estimates nor the cost/benefit analysis. Although the Bank did identify the fact that some people would be displaced, it did not seem to appreciate the full extent of this displacement. In the end over 2000 people were displaced, at a total cost of over US$28 million.

10. Borrower Performance

10.1 The government and KMPA implemented the project satisfactorily in terms of civil works and procurement of equipment. There were, however, problems associated with land acquisition and environmental impacts which were neglected during the design stage and had to be addressed during implementation. The extent of land acquisition and compensation requirements were not fully appreciated nor were the costs included in project estimates. This resulted in implementation delays (para 9.1).

10.2 At the time of project preparation environmental aspects of disposal or dredged spoil were also never addressed. It had been simply assumed, without investigation, that dredge material would be suitable for use as reclamation fill. During implementation, however, it was determined that in actual fact this was not so, and that appropriate disposal measures had to be taken. In addition suitable substitute fill had to be located and transported to the works site. The problem was resolved, but at an added cost to the project. Furthermore, in the original implementation schedule, the sand used for the project was to be removed from the Nakdong River, near the estuary. However, the impact of this action was never analyzed, nor were any permits processed. As it happened, the city of Pusan discovered this activity and abruptly curtailed it, again, necessitating a search for alternate solutions. This was found without too much difficulty however, and the project progressed uninterrupted.

10.3 Finally, during project preparation the Bank, with the support of the Borrower, had formulated a substantive technical assistance package, which was virtually canceled within six months of project approval (one month of project effectiveness). Such quick action leads one to question the Borrower's sincerity in carrying out the exercise.

11. Project Relationships

11.1 The excellent relationship that has existed between the staffs of the Borrower and the Bank, during both preparation and implementation, has been one of the main factors which contributed to project success. It created good teamwork, in which each party displayed appropriate flexibility. This resulted in quick resolution of issues which otherwise could have significantly delayed project completion. The relationship between the Korea Maritime Institute (KMI) and KMPA was also very good, with KMI in charge of many of the studies identified under the KMPA Action Plan.

11.2 Some inter-agency relationships appear to have been more stressful. Meetings between KNR and KMPA have been few and far between, with resultant mis-understandings and mis-givings. The same applies to the relationship between the city of Pusan and KMPA, and the Port of Pusan, where meetings to address differences and resolve issues of concern were rarely conducted. As a result, one of the main project objectives, to remove the off-dock container yards located in the city and place them in a single area accessible by both road and rail became a long drawn out process, achieved only when the city itself became so congested that it was necessary to take definitive action.

12. Project Documentation and Data

12.1 The covenants contained in the loan agreement were reasonable and the Borrower complied with them. A side letter indicating the various studies to be conducted and the action plans (Financial and Managerial) to be prepared, were substantially complied with.

12.2 The Action Plans themselves, as well as the Staff Appraisal Report provided a useful framework during the implementation of the project. The Project Completion Report (PCR) for the Coal and Cement Distribution Project (Ln 2267-KO), and the PPAR for the First and Second Pusan Ports Projects (Loans 917/1401-KO) as well as the Bank project files and the Bank supervision reports, provided useful information for the preparation of this project completion report.

12.3 KMPA records of the project however were both fragmented and difficult to obtain. Records in the Port of Pusan were also not readily available. Project data was split between KMPA and the port with the result that there was no central source and neither knew what the other had. In future it is recommended that a central project file be kept up to date, periodically reviewed by the implementing agency and available to the Bank upon request.

PART II: BORROWER'S EVALUATION

A. Conditions leading To The Project

A.1 Discussion concerning the construction of Phase III of Pusan Port began as early as 1980, with detailed drawings and engineering completed in 1982. However, in those years Korea was experiencing an economic recession, and as a decrease in traffic volume was recorded between the years 1981 and 1982 the GOK decided to postpone investment in the Port. The economic boom of the next few years had not been anticipated, and when the GOK finally decided that investment in the port was needed it was about two years too late to accommodate traffic growth. When the government approached the Bank for financing in 1984, traffic had grown by an average annual rate of almost 8% between 1982 and 1984, and container traffic had grown by over 11%. As a result some changes had to be made to the original design, which prolonged the preparation phase. The quay length was expanded, some more land added and the draft increased to accommodate larger vessels.

B. Main Findings and Lessons Learned

B.1 The following includes the findings and lessons which were identified by the Borrower:

(a) Land acquisition has become extremely difficult in Korea over the last few years, with compensation amounts being far in excess of estimates. In the future KMPA will attempt to limit construction to those areas with the least impact on residents, and in as far as is possible concentrate on land reclamation to increase port size;

(b) Some problems, such as removal of off-dock CYs and streamlining customs activities, is beyond the scope of KMPA. In order to achieve success in dealing with such issues, the full support of the city of Pusan is required;

(c) The city of Pusan, although enjoying the fruits of productivity resulting from the Port, is also experiencing serious congestion problems. Unless the port works with the city in identifying problems created by the port's presence, and works closely with the city in resolving these, neither will reap the full benefits of the port's operation; and

(d) Container traffic continues to grow at a pace which outstrips forecasts, making it difficult for the port to expand at a pace which can accommodate this growth. Even the development of Phase IV is expected to be too little too late.

C. Summary of Bank Role and Performance

C.1 The Bank performed well during project implementation, with an appropriate level of supervision and expertise provided. Since the executing agency was experienced in the implementation of similar works, the flexible approach adopted by the Bank enabled smooth implementation of the project. During implementation supervision missions were sent to Korea on a regular basis, about once per year, with the final project review carried out by the PCR mission in September/October 1992. Disbursement of the loan proceeds were prompt, with the contractors receiving their payments in a timely manner.

D. Evaluation of Borrower's Own Performance

D.1 The Borrower, likewise performed well during project implementation. The only criticism that can be levied is that the project began about two years too late to accommodate the increase in traffic. As a result, during implementation, there was a great demand to expedite construction and operationalize the facilities as quickly as possible.

D.2 The only difficulties encountered concerned issues of respecting acquisition of land, and resettlement and compensation of affected residents, which were not thoroughly investigated nor appropriately costed during project preparation. However, the executing agency vigorously pursued resolution of the issue of compensation and resettlement of affected residents, with the result that the project progressed with only a year's delay incurred.

E. Remaining Issues

E.1 The one remaining and outstanding issue concerns the completion of the rail access link. The court case involving its purchase has recently been resolved, with completion of construction expected by mid-1993.

PART III. STATISTICAL INFORMATION

Table 1: RELATED BANK LOANS AND/OR CREDITS

Loan/Credit	Purpose	Year of Approval	Status	Comments
First Port Project (Ln 917-KO)	The project covers the proposals in the 1972-76 Development Program for Pusan and Mukho to meet traffic requirements of these ports up to about 1986 by providing: In Pusan: (a) a composite pier to handle containers and grain, with storage silos, appropriate equipment and necessary dredging: (b) a dry bulk cargo handling pier with integrated bulk-handling systems, and necessary dredging; (c) international (Korea-Japan) and coastal ferry terminals; (d) rehabilitation of existing general cargo berths; and (e) a new military berth to be financed by the government. In Mukho: (f) improvements to the coal handling piers and the mechanical loading system; (g) improvements; to the existing breakwater; (h) minor improvements to general cargo and cement berths. Consulting Services and Technical Assistance: (f) consulting services for the detailed engineering and construction supervision of above works; the determination of future development requirements. Technical assistance to assist in establishing KPA and on the job training of personnel.	1972	Completed	PCR issued: PPAR No. 5756 of June 1985.
Second Port Project (Ln 1401-KO)	To continue development of Pusan Port being financed under the First Port Project (Loan 917-KO). The project consists of: (1) Civil Works - (a) 700 m extension of the common user container berths and a 335,000 sq m expansion of the stacking area provided under that project; (b) dredging to provide an alongside depth of 12.5 m; (c) an access road inside the port limits; a guard house and an 8,000 sq m container freight station; (d) ancillary works and utilities; and (e) rehabilitation of piers 3 and 4, the central wharf, and a lighter wharf No. 5. (2) Mechanical Equipment - Procurement of container cranes and mobile container handling equipment. (3) Floating Craft - Procurement of two tug boats. (4) Engineering Consultant Services - to carry out detailed design and supervision of construction and procurement of the above. (5) Technical Assistance and Training - to assist in cargo handling (including the handling of containers), maintenance, port planning and accounting.	1976	Completed	PCR issued: PPAR No. 5756 of June 1985
Coal and Cement Distribution Project (Ln 2267-KO)	To provide necessary capacity in rail, ports and inland terminals to efficiently handle the forecasted coal and cement traffic through the 1980s and to correct the system inefficiencies in coal and cement distribution.	1983	Completed	PCR issued: 12/16/89

Table 2: BANK RESOURCES

A. Staff Input

Stage of Project Cycle	Number of Staffweeks
Through Appraisal	62.4
Appraisal through Board Approval	53.4
Board Approval through Effectiveness	9.7
Supervision	61.7
Project Completion Report	6.0
Total	193.2

B. Missions

Month/Year	No. of Persons	Days in Field	Specialization	Performance Rating
Preparation				
July 1980	3	16	FA/TE/ED	n.a.
September 1980	3	8	FA/PE/RE	n.a.
October 1981	1	7	CO	n.a.
November 1981	1	7	PE	n.a.
August 1984	2	21	EC/PE	n.a.
January 1985	3	20	EC/TE/PE	n.a.
July 1985	6	21	EC/PE(2)/FA/PR/RE	n.a.
Appraisal				
October 1985	7	21	EC/PE/FA(2)/RE(2)/AD	n.a.
Through Board Approval				
March 1986	2	7	EC/RE	n.a.
May 1986	3	4	RE/LC/PE	n.a.
Supervision				
February 1987	1	6	PE	1
May 1987	5	6	RE(2)/FC/PE/CO	
November 1987	4	8	FC/PE/RE/TE	1
June 1988	3	10	FC/EC/TE	1
November 1988	5	9	FC/RE/PE/EC/PA	1
April 1989	1	10	FC	2
February 1990	3	8	FC/AD/RE	2
April 1990	1	2	PR	
May 1990	2	7	FC/PE	1
PCR Preparation				
September 1992	3	5	EC/TE/OA	

FA - Financial Analyst
EC - Economist
RE - Railway Engineer
PR - Procurement Specialist
LC - Legal Counsel
OA - Operations Assistant
TE - Transport Engineer
PE - Port Engineer
CO - Country Officer
AD - General Administration
PA - Port Operations Advisor

Table 3: STATUS OF LEGAL COVENANTS

Section	Description	Status
4.01	KMPA shall provide audited financial statements for the organization and a separate opinion for the statement of expenditures by 08/31 of each year.	Complied with.
4.02	KMPA and PDMPA shall, in years 1986 and thereafter, earn a rate of return on net fixed assets in operation of at least 5 percent and 7 percent respectively.	Complied with.
Side letter	Complete the various studies and implement the actions specified in the two action plans "Financial and Managerial" and the "Inland Container Handling Operations."	Complied with. For details see Annex 1.

Table 4: CUMULATIVE ESTIMATED AND ACTUAL DISBURSEMENT
(US$ million)

Semester Ending	Appraisal Estimate	Actual	Actual as % of Estimate
12/31/86	2.0	0	0
06/30/87	18.0	10.0	55.6
12/31/87	35.0	17.4	49.7
06/30/88	50.0	33.8	67.6
12/31/88	65.0	43.1	66.3
06/30/89	80.0	68.7	85.9
12/31/89	94.0	75.0	79.8
06/30/90	106.0	103.4	97.5
12/31/90	120.0	119.6	99.7
06/30/91	133.0	130.8	98.3
12/31/91	141.0	134.5	95.4
06/30/92/a	--	134.5	--

Date of final disbursement: January 15, 1992
US $6.5 million cancelled on October 29, 1986.

/a Closing Date

Table 5: ESTIMATED PROJECT COST AT APPRAISAL VS. ACTUAL EXPENDITURES [a]
(W Million)

	Appraisal Estimate			Actual Expenditures		
	Local	Foreign	Total	Local	Foreign	Total [b]
Civil Works						
South Breakwater	16,581	24,872	41,453	15,235	16,732	31,967
Container Terminal & Related Facilities	32,479	48,714	81,193	33,565	28,426	61,991
North Breakwater	22,234	33,354	55,588	20,021	25,261	45,282
Access Road & Railroad	20,421	5,128	25,549	6,115	3,388	9,503
Subtotal:	**91,715**	**112,068**	**203,783**	**74,936**	**73,807**	**148,743**
Equipment						
Container Cranes	827	9,220	10,047	8,462	2,013	10,475
Transfer Cranes	875	9,735	10,610	9,459	1,544	11,003
Mobile Equipment	--	2,274	2,274	--	4,280	4,280
Subtotal:	**1,702**	**21,229**	**22,931**	**17,921**	**7,837**	**25,758**
Technical Assistance						
Studies & Training	2,679	1,133	3,812	--	275	275
Subtotal:	**96,096**	**134,430**	**230,526**	**92,857**	**81,919**	**174,776**
Value Added Tax & Customs Duties	11,756	--	11,756	--	--	--
Physical Contingencies	4,805	6,722	11,526	--	--	--
Price Contingencies	14,541	27,109	41,650	--	--	--
Land Acquisition	--	--	--	21,200	--	21,200
Grand Total:	**127,198**	**168,261**	**295,458**	**114,057**	**81,919** [c]	**195,976**

[a] Exchange rate used for Appraisal Estimates: $1.00 = W900. Exchange rate used for Actual Expenditures: $1.00 = W750, representing the average rate of exchange during the period that expenditures were made.

[b] Value Added Tax, Custom Duties and Price Escalation Costs included.

[c] Direct foreign exchange expenditures. Source: KMPA

Table 6: DETAILED PROJECT COSTS
(Thousand Won)

Description	Unit	Quantity	Amount
Project 1: South Breakwater			
Dredging	m^3	1,106,790	4,427,160
Sand fill	m^3	867,287	4,242,539
Quarry run rock	m^3	365,530	6,023,798
Armor stone	m^3	121.190	4,063,514
Tetrapod	EA	15,308	1,530,800
Precast concrete block	EA	778	740,100
Precast concrete caisson	EA	37	5,730,917
Cap concrete	m^3	58,593	2,579,205
Change orders	LS	1	761,844
Mobilization & demobilization	LS	1	490,414
Value added tax (VAT)	LS	1	1,376,563
Total			31,966.854
Project 2: Container Terminal & Related Facilities			
Mobilization			232,661
Construction			56,380,327
Cost Escalation			2,239,540
VAT			3,138,578
Total			61,991,106

Description	Unit	Quantity	Amount
Project 3: Access Road and Railroad			
Earth work	m^3	105,000	450,000
AC pavement	m^3	20,200	593,000
PCC pavement	m^3	2,940	161,700
Retaining wall	m	930	420,000
Marine clay dredging	m^3	108,970	482,886
QRR type III	m^3	51,990	1,149,943
Armor stone	m^3	5,480	201,533
Reclamation	m^3	96,000	339,165
Rail	m	4,500	4,837,161
Building	EA	1	867,659
Total			9,503,047
Project 4: North Breakwater			
Dredging	m^3	1,236,410	4,442,748
Sand fill	m^3	1,005,470	5,218,389
Quarry run rock	m^3	449,260	8,163,082
Armor stone	m^3	165,768	6,167,346
Tetrapod	EA	13,571	1,810,831
Precast concrete black	EA	1,090	904,038
Precast concrete caisson	EA	50	10,490,525
Cap concrete	m^3	87,506	3,377,644
Change orders	LS	1	92,906
Mobilization & demobilization	LS	1	762,590
Escalation	LS	1	1,877,917
Value added tax (VAT)	LS	1	1,973,685
Total			45,281,701

Table 7: OVERSEAS TRAINING

Type	No. of Trainees	Govt. Agency	Period	Place	Expenses	Course/ Contents
Short term	2	KMPA	7/30/88 - 8/14/88	USA	US$7,592	Tour of US Ports to review port operations, management & information systems
Medium term	2	KMPA	10/01/89 - 10/30/90	Netherlands	US$5,494 Dfl 5,620	Port Operation and Coastal Transportation
Long term	3 1	KMPA EPB	9/88 - 9/91	USA, UK and Japan	US$51,677 £ 60,026 ¥ 5,670,572	Business Management, Fiscal Policy and Marine Economic Policy
Others	4	Various			US$10,025	
Total					US$279,305.67	

Table 8: IMPLEMENTATION SCHEDULE /a

Item	Start		Completion	
	SAR	Actual	SAR	Actual
Civil Works				
South Breakwater	July 1986	Aug 1986	Dec 1988	Nov 1989
North Breakwater	Dec 1986	Feb 1987	Sep 1990	Nov 1990
Container Terminal	Apr 1987	Apr 1987	Dec 1990	Feb 1992
Access Road & Railroad	July 1988	Sep 1988	Dec 1990	Jun 1993 /b
Equipment				
Container Gantry Cranes	Jan 1988	Jan 1989	Dec 1990	Apr 1991
Container Transfer Cranes	Jan 1988	Jan 1989	Dec 1990	Apr 1991
Mobile Equipment	Apr 1989	Oct 1990	Dec 1990	May 1991

/a Construction of civil works or procurement of equipment. Comparison of dates estimated at time of appraisal vs. actual dates.

/b Anticipated completion date.

Table 9: PORT TRAFFIC PROJECTIONS - PUSAN PORT
('000s Revenue Tons)

	1991				1996				2001				2006				2011			
	Import	Export	Coastal	Total	Import	Export	Coastal	Total	Import	Export	Coastal	Total	Import	Export	Coastal	Total	Import	Export	Coastal	Total
Grain	1,156	-	194	1,175	1,684	-	116	9,221	2,057	-	144	2,201	2,273	-	176	2,449	2,410	-	214	2,624
Oil	1,015	12	9,277	10,304	1,256	18	10,895	12,169	559	25	12,771	14,355	1,256	-	10,895	12,169	1,559	25	12,771	14,355
Fats	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fertilizer	-	-	-	-	7	1,024	-	1,031	8	1,130	-	1,138	9	1,248	-	1,257	10	1,377	-	1,387
Cement	609	56	1,717	1,382	-	110	2,761	2,871	-	127	3,764	3,891	-	151	5,000	5,151	-	182	6,629	6,811
Anthracite	15	-	464	479	20	-	496	516	4	-	286	290	-	-	174	174	-	-	106	106
Binuminous Coal	16	-	111	127	21	-	-	21	26	-	-	26	29	-	-	29	31	-	-	31
Lumber	1,190	-	-	1,190	2,710	-	-	2,710	3,486	-	-	3,486	3,955	-	-	3,955	4,225	-	-	4,225
Salt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine Products	-	280	-	280	-	314	-	314	-	358	-	358	-	403	-	403	-	448	-	448
Fresh Fishes	892	-	-	892	1,118	-	-	1,118	1,287	-	-	1,287	1,484	-	-	1,484	1,683	-	-	1,683
Iron Ore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphate Rock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Ore	397	439	-	836	621	735	-	1,356	866	846	-	1,712	1,207	1,089	-	2,296	1,686	1,422	-	3,108
Machinery	1,976	1,348	-	3,324	2,542	4,131	-	6,673	3,423	7,090	-	10,513	4,529	11,106	-	15,635	6,062	17,282	-	23,344
Iron Material	2,744	1,766	505	5,015	4,380	4,134	711	9,225	5,366	5,057	977	11,400	5,871	6,555	1,173	13,599	6,163	7,820	1,407	15,390
Scrap	1,197	16	-	1,213	1,039	16	-	1,055	893	16	-	909	767	16	-	783	659	16	-	675
Others	16,594	23,815	1,478	41,887	18,290	26,874	1,856	47,020	21,596	27,226	2,915	51,737	26,931	29,398	4,324	60,653	36,761	30,888	6,310	73,959
Total	27,209	27,720	9,649	64,578	3,242	37,348	14,341	84,931	40,027	41,862	17,363	99,252	48,311	49,984	21,742	120,037	61,218	59,460	27,437	148,146

Source: KMPA

Table 10: PORT TRAFFIC PROJECTIONS - WHOLE COUNTRY
('000s Revenue Tons)

	1991				1996				2001				2006				2011			
	Import	Export	Coastal	Total	Import	Export	Coastal	Total	Import	Export	Coastal	Total	Import	Export	Coastal	Total	Import	Export	Coastal	Total
Grain	9,406	5	164	9,575	15,034	0	448	15,482	18,372	0	558	18,930	19,995	0	680	20,575	21,514	0	828	22,342
Oil	67,018	9,629	60,903	137,550	92,491	17,327	83,454	188,272	115,924	14,145	91,660	221,719	148,409	18,623	107,940	269,872	177,999	24,178	126,944	329,121
Fats	392	356	46	794	378	30	56	464	474	30	56	560	697	30	66	683	751	30	56	837
Fertilizer	750	968	324	2,042	945	1,143	320	2,408	1,127	1,262	320	2,709	1,324	1,393	320	3,037	1,168	1,535	320	3,323
Cement	7,232	1,756	21,770	30,758	2,500	5,118	27,252	34,870	0	5,947	38,199	44,148	0	7,047	52,299	58,346	0	8,510	71,598	80,108
Anthracite	1,551	0	2,481	4,032	214	0	2,308	2,522	41	0	1,330	1,471	0	0	810	810	0	0	494	494
Bituminous Coal	27,956	505	1,232	29,693	41,793	0	3,053	44,646	65,606	0	4,383	70,491	70,595	0	733	78,328	74,833	0	11,990	86,823
Lumber	9,384	52	53	9,453	13,736	0	57	13,793	17,671	0	70	17,747	20,247	0	0	20,247	21,415	0	135	21,550
Salt	1,301	0	0	1,301	2,065	0	18	2,083	2,761	0	18	2,779	3,720	0	0	3,720	4,982	0	18	5,000
Marine Products	116	291	98	505	123	350	196	669	160	399	236	765	165	450	284	699	194	501	340	1,035
Fresh Fishes	917	2	56	977	1,129	5	1	1,317	1,300	6	219	1,624	1,499	5	264	1,768	1,701	5	318	2,024
Iron Ore	29,423	0	211	29,634	37,870	0	453	38,323	42,920	0	629	43,449	52,300	0	630	52,830	63,730	0	530	64,760
Phosphate Rock	1,560	0	0	1,560	1,760	0	0	1,760	1,939	0	0	1,939	2,141	0	0	2,141	2,368	0	0	2,368
Other Ore	3,307	713	1,768	5,708	5,039	1,168	3,469	9,676	7,022	1,344	4,767	13,153	9,787	1,731	6,553	18,071	13,671	2,260	9,031	24,962
Machinery	2,301	2,357	728	5,386	2,951	6,313	1,643	10,907	3,973	10,764	2,647	17,384	5,257	16,661	3,844	25,962	7,035	26,236	5,563	38,834
Iron Material	9,637	8,403	6,974	25,014	114,887	11,746	38,162	16,360	16,477	16,125	62,952	21,576	23,945	21,744	67,744	67,285	27,998	30,911	26,084	84,893
Scrap	3,729	40	3	3,772	3,238	40	0	3,278	2,782	40	0	2,822	2,390	40	0	2,430	2,064	40	0	2,094
Others	34,602	27,349	33,380	93,331	48,289	39,824	47,363	135,476	72,448	51,195	74,339	197,983	99,386	60,915	110,275	270,578	135,131	70,876	160,974	366,981
Total	210,546	52,426	130,193	393,165	281,084	81,205	182,019	544,308	370,872	103,609	237,972	712,453	454,470	130,940	313,450	898,660	556,844	164,032	415,223	1,137,049

Source: KMPA

Table 11: PDMPA INCOME STATEMENT (1987-91)
(Won million)

Item	1987		1988		1989		1990		1991	
	SAR	Actual	SAR	Actual	SAR	Actual	SAR	Actual	SAR	Actual
Operating Revenues										
Port revenues	31,579	31,745	34,803	29,032	38,356	29,439	42,272	30,968	46,589	29,284
Rental revenues	17,296	23,186	19,062	3,444	21,008	29,540	23,153	22,836	25,517	5,828
Equipment revenues	138	-	152	-	167	-	184	-	203	-
Subtotal	49,015	57,143	54,016	54,498	59,531	61,127	65,610	56,002	72,308	37,352
Operating Expenses										
Salaries	1,696	1,589	1,834	1,662	1,984	1,994	2,145	2,270	2,320	2,657
Administration expenses	1,182	1,223	1,217	1,488	1,254	1,531	1,291	1,775	1,330	1,902
Maintenance expenses	1,955	942	2,384	600	2,918	604	3,498	723	4,138	548
Depreciation	5,008	5,323	6,471	5,317	8,453	5,811	10,618	6,453	13,568	7,507
Subtotal	9,842	9,077	11,907	9,067	14,609	9,940	17,553	11,221	21,356	12,614
Operating Income	39,171	48,066	42,10[illegible]	45,431	44,922	51,189	48,057	44,781	50,952	24,738
Non-Operating Income										
Gain on foreign currency translation	0	-	0	21,651	0	5,210	0	109	0	15
Others	4,041	3,960	4,041	5,649	4,041	7,500	4,041	5,049	4,041	5,476
Subtotal	4,041	3,960	4,041	27,300	14,041	12,710	4,041	5,158	4,041	5,491
Non-Operating Expenses										
Interest	8,176	9,164	10,871	8,657	13,797	9,057	15,207	8,987	16,027	8,562
Loss from foreign currency	0	11,304	0	548	0	86	0	14,008	0	3,014
Subtotal	8,176	20,777	10,871	9,428	13,797	9,357	15,207	23,202	16,027	11,925
Ordinary Income	35,036	31,249	35,279	63,303	35,166	54,540	36,891	26,637	38,966	-
Special Gain (Loss)	0	(616)	0	(2,579)	0	(4,371)	0	(246)	0	(1,006)
Net Income	35,036	30,633	35,279	60,724	35,166	50,169	36,981	26,391	38,966	17,298

Source: KMPA

Table 12: PDMPA BALANCE SHEETS (1987-91)
(Won million)

	1987		1988		1989		1990		1991	
	SAR	Actual	SAR	Actual	SAR	Actual	SAR	Actual	SAR	Actual
ASSETS										
Current Assets										
Accounts receivable	4,688	3,982	5,167	2,632	5,695	1,273	6,276	218	6,377	241
Stores	289	40	346	42	341	38	511	34	540	43
Others	3	5,267	3	1,614	4	5,899	5	2,585	6	167
Total current assets	4,980	9,289	5,517	4,288	6,040	7,210	6,792	2,837	6,923	451
Less: current liabilities										
Current loan maturies	10,739	9,725	18,675	13,793	24,358	14,511	25,107	20,255	25,372	14,891
Others	1,777	1,819	2,362	1,931	2,998	1,427	3,305	1,745	3,483	2,517
Total current liabilities	12,515	11,544	21,037	15,724	27,856	15,938	28,412	22,000	28,855	17,408
Net Working Capital	(7,535)	-2,255	(15,520)	-11,436	(21,816)	-8,728	(21,620)	-19,163	(21,932)	-16,957
FIXED ASSETS										
Gross value - Land	156,245	140,865	180,647	141,588	206,885	157,431	236,495	693,357	255,291	727,346
Gross value - Others	140,231	130,321	181,197	135,523	236,694	146,423	297,307	204,277	379,894	268,484
Accumulated depreciation	28,033	16,926	34,504	21,770	42,958	26,761	53,576	9,328	67,143	17,399
Net value - Other Assets	112,198	113,395	146,692	113,753	193,737	119,662	243,731	194,949	312,751	251,085
Total net fixed assets	268,443	254,260	327,339	255,341	400,622	277,093	480,226	888,306	568,042	978,431
Work in progress	90,582	56,272	111,483	112,469	121,429	153,702	126,741	123,628	42,634	97,941
Total fixed assets	359,025	310,532	438,822	367,810	522,051	430,795	610,675	1,011,934	606,967	1,076,372
OTHER ASSETS	18	13	14	13	19	13	14	16	19	16
Total Assets	351,509	308,290	423,315	356,387	500,254	422,080	585,3[illegible]	992,787	588,762	1,059,431
Liabilities and Equity										
Long term debt	106,072	116,708	130,958	100,502	154,371	84,539	158,494	108,748	152,022	110,730
Total equity	245,437	191,582	292,357	255,885	345,883	337,541	426,867	884,039	436,740	948,701
Total liabilities and equity	351,509	308,290	423,315	356,387	500,254	422,080	585,362	992,787	588,762	1,059,431

Source: KMPA

Table 13: MONITORING INDICES
Development of Financial and Managerial Functions

		Need for and origin of assistance		Target date for implementation		Actual implementation	
	Implementing agency	Korea	Foreign	Start	End	Start	End
DEVELOPING MAIN FUNCTIONS							
Commercial Accounting							
Prepare TOR for accounting computerization	KMPA	X	-	Ongoing	10/01/86	-	10/86
Computerizaiton implementation plan	KMPA	X	-	09/01/86	05/31/88	10/15/86	05/31/87
Obtain staffing approval	KMPA/MOGA	-	-	01/01/81	06/30/89	-	09/90
Staged implementation	DMPAs	X	-	12/31/91	12/31/95	07/10/91	12/31/93
Costing Accounting							
System design TOR	KMPA	-	-	Ongoing	10/01/86	-	10/86
Design cost system	KMPA	X	X	01/01/87	06/30/87	07/10/91	03/31/92
Initial implementation	KMPA/PCTOC	-	-	01/01/89	01/01/91	-	-
Staged manual implementation	PDMPA	X	-	01/01/89	01/01/91	-	-
Computerized conversion	DMPAs	X	-	01/01/91	12/31/92	04/01/92	12/11/93
Management Information System (MIS)							
Submit TOR to IBRD	KMPA	-	-	Ongoing	10/01/86	-	10/86
Evaluate existing information system	KMPA	X	-	09/01/86	06/01/87	10/15/86	05/31/87
Develop master plan	KMPA	X	X	07/01/87	06/30/89	10/15/86	05/31/87
Incorporate accounting needs	KMPA	X	-	07/01/87	12/31/88	10/15/86	05/31/87
Test implementation	KMPA/PCTOC	X	-	01/01/89	12/31/89	10/25/89	12/91
Link systems	DMPAs	X	-	01/01/90	12/31/95	01/04/92	Ongoing
INSTRUMENTS							
Training							
Implement a management training program	KMPA/MOT	X	X	Ongoing	06/01/88	-	-
Train senior management in computer applications	KMPA/MOT	X	-	06/01/87	06/01/89	-	-
Computerization							
Develop a 5 year computerization program for:	KMPA/MOGA	X	X	Ongoing	1995	-	-
Commercial accounting, budgeting, property and supply control, cost accounting, strategic planning, port operations (PORTMIS), cargo statistics, personnel management, etc.		-	-	-	-	03/01/89	11/30/91
		-	-	-	-	04/01/92	12/31/93

STATUS OF ACTION PLANS

Action	Results
I. MASTER PLAN Updating the Master Plan for Pusan Port	• TORs submitted to the Bank for review as agreed • Study by KMPA started in early 1988 • Draft report reviewed by Bank mission in December 1988 • Final report scheduled for April 1989 • Final report received January 1990, presented to Bank mission in February 1990; presentation included City of Pusan Master Plan and the Master Plan for Kwangyang Bay • Bank provided its comments
II. OPERATIONAL STUDIES - ACTION PLAN **A. KMPA** 1. Increase utilization of CY and CFS	• Project conducted by PCTOC • Study completed by Woodward Clyde Consultants in 02/87 • Bank comments provided 05/87 • Studies conducted by American President Lines (APL) in 1986 and 1987 • CFS opened to US flag carriers on 01/88 • Expansion of CY started in mid-1988 • Double cycling and new yard layout started in 1988 based on recommendations provided by APL • CFS under utilized - consideration given to making CFS available to other foreign flagged ships • Starting 01/89 CFS open to all carriers • CFS still under utilized due in large part to the existence of contracts with the various off-dock CYs • CY was expanded - total ground slots increased by 800 to 9,900 • Plans made to increase ground slots by 800 to total 10,700 • Utilization of CFS still under capacity

Action	Results
2. Improve access procedures to PCTOC rail terminal	• Addressed in updating of Master Plan and in the revised design of container terminal • KMI study completed in 1988 and sent to Bank in 1989 • Considered to not be feasible in prior years, KMPA again reviewed the issue to determine if a flyover is practicable • No improvement is envisaged; KMPA believes that congestion will lessen with the full operation of the new container terminal.
3. Increase throughput capacity of PCTOC	• Free time for imports and exports standardized for all carriers at 5 and 4 days respectively on 01/88 • Increased investment in straddle carriers and transtainers during 1988 and 1989 • Estimated volume for 1988 is 1.22 million TEUs versus appraisal estimate of .998 million • Target for maximum stacking of 14,000 TEUs has been achieved. CY capacity increased from 17,500 TEUs in 1988 to over 19,000 but target level is 12,000--beyond that level, efficiency declines • A ninth container crane was installed in 1989 along with additional yard equipment referred to above • Gantry crane net productivity has increased steadily from the low of 17 in 1986 to 21.1 in 1988 and 22.4 in 1989 • Productivity of cranes declined in 1990 to 21.5 teu/hr.

Action	Results
4. Relocation of off-dock CYs to Dongmyung	• KMI contracted to do study • Preliminary work and draft reports discussed with Bank • Bank comments on draft report were issued in 11/87 but could not be reflected in final report because contract was over • Report concluded the yards could not be eliminated until completion of the fourth phase expansion due to the excessive number of containers moving through the port • KMPA attempting, utilizing Bank's comments, to reduce congestion in city • MOT considered developing an inland terminal north of Pusan, at Yangsan, to consolidate some of the yards located in the city • Decision made to incorporate Dongmyung into third phase CY • Off-dockyards will be consolidated into Yangsan ICD (about 20 km northwest of Pusan) when completed in 1994; area, consisting of 1.5 million sq m, has good road and rail access • Decision made to construct ICD at Yangsan in May 1991; should be operational in 1994/95, to be operated by Korea Container Terminal Authority; decision also made to convert Bugok into an ICD to be operated by KNR.
5. Extend storage capacity of PCTOC	• Study conducted by KMI • Draft TORs provided to Bank mission and comments provided 05/87 • Revised TORs reviewed by Bank mission 11/87 and comments included in final TORs • Study completed in late 1988 and copy sent to Bank in 1989 • Inland terminal considered by MOT and the utilization of Bugok terminal increased by KNR • Yangsan ICD will begin operation in 1994/95

Action	Results
6. Expand capacity of PTOC rail terminal	• Issue addressed in updating of master plan • KMI study completed in 1988 and a copy sent to Bank in 1989 • Starting in 1989 cut-off schedules were revised to allow KNR an additional 10 hours of delivery time; new procedures increased utilization to 78 percent of capacity in 1989 from about 40 percent in prior years • No action can be taken to expand rail terminal, as recommend by KMI study, until third phase reaches full operation because expansion would reduce the amount of available CY at PCTOC
7. Develop organization and management plan for new terminal	• KMPA undertook study • Draft report made available for review by Bank • Legislation passed in 12/89 to create new company to manage all container terminals in Pusan, Kwangyang Bay and Yangsan; company formed in 04/90; company is financially independent and reports to PDMPA; new management and information systems are being developed starting in 1990 • Korea Container Terminal Authority became operational in April 1990 responsible for operations of all national container terminals; operations of the third phase terminal was awarded to a consortium of private stevedoring firms in Pusan and PCTOC
B. KNR 1. Increase speed and frequency of trains between Seoul and Pusan	• 12 trains including one irregular train are operating per day per direction • Train speed improvement of 90 km/h as of October 5, 1990 • Increased frequency of container cars from 18 trains to 22 trains a day as of August 20, 1992
2. Improve access to Pugok for all shippers	• Pugok container yard is open to all capable shippers. At present 18 companies are using yard
3. Improve utilization of Pugok CFS	• One CFS is being operated by Saebang Company
4. Use PCTOC Rail Terminal to form and receive all Seoul container trains	• Utilization of Rail Terminal increased to 78 percent of capacity in 1989 from about 40 percent in previous years
5. Integrate Pugok and PCTOC using some computerized system	• This is being implemented as a part of the OIS project

<table>
<tr><th colspan="3">Action</th><th colspan="6">Results</th></tr>
<tr><td colspan="3">6. Further increase train length</td><td colspan="6">• The length of container train (regular) was increased from 22 cars beginning in May 1990
• When the extension of passing loops (19 stations in Kyongbu line) from 500 m to 630 m is completed at the end of 1993, it will be possible to increase the length of container trains from 25 cars to 30 cars.</td></tr>
<tr><td colspan="3">7. Daily roundtrip</td><td colspan="6">• Container trains usually operating at night
• Daily roundtrip will be possible after construction of Kyongbu High Speed Line</td></tr>
<tr><td colspan="3">8. Reinforce loading and unloading equipment at Pugok and PCTOC</td><td colspan="6">• 5 transtainers, 26 top handlers and 24 forklifts are being operated</td></tr>
<tr><td colspan="3">9. Others
a. Improve charging system</td><td colspan="6">Present charging system (Pugok-Pusanjin):</td></tr>
<tr><td colspan="3" rowspan="2">Classification</td><td colspan="2">45</td><td colspan="2">40</td><td colspan="2">20</td></tr>
<tr><td>loaded</td><td>empty</td><td>loaded</td><td>empty</td><td>loaded</td><td>empty</td></tr>
<tr><td colspan="3">Basic rate (unit: won)</td><td>245,230</td><td>130,790</td><td>224,210</td><td>112,100</td><td>112,100</td><td>56,050</td></tr>
<tr><td colspan="3" rowspan="2">Discounting (%)</td><td>15</td><td></td><td>15</td><td></td><td></td><td></td></tr>
<tr><td>up</td><td>15</td><td>*20</td><td>15</td><td>*20</td><td>15</td><td>*20</td></tr>
<tr><td colspan="3"></td><td>down</td><td colspan="5">* 20% discount of basic rate in case of the contracted traffic over 15,000 ton in a year (Only down empty container)</td></tr>
<tr><td colspan="3">b. Construction of access to railroad at Pusan Port</td><td colspan="6">• The rail entrance between Pugok and Pusanjin is under construction by KMPA
• Operate average 6 trains a day between Pugok and PCTOC</td></tr>
<tr><td colspan="3">C. <u>By KMPA and KNR</u>
1. Improve road access to on-dock and Dongmyung CYs</td><td colspan="6">• Detailed designs being prepared by KMPA
• Funding for land acquisition approved
• Road to open in late 1991 or early 1992
• Funding provided by EPB, procurement under LCB
• Construction started in May 1989 with completion date of late 1991</td></tr>
<tr><td colspan="3">2. Reduce interference at entrance to PCTOC</td><td colspan="6">• Determination made by PDMPA and city that proposed changes are not possible
• No further actions planned</td></tr>
</table>

Action	Results
3. Design and implement management and marketing system for container services of KNB, PCTOC and new terminal	• KMI study completed in 1988, sent to Bank in 1989 • No actions taken, limited coordination between KMPA and KMI; issue discussed with both agencies and MOT; mission recommended a Special Committee be formed by MOT in 1990 to address issues related to improving the transportation information system.
III. FINANCIAL AND MANAGERIAL ACTION PLAN 1. Commercial Accounting	• Work by KAIST and Ahn Kwon • System design scheduled for 12-15 months • Project originally scheduled for mid-1990 • Project has been postponed--lack of funding due to reduction in 1989 budget is one reason for delay--other is lack of interest • Government is considering requiring that KMPA use commercial accounting--this would help the component. Otherwise this item is not very attractive to a government agency • EPB has decided to postpone this component; work will resume starting in about 1996; delay is due to budgetary limitation • No further actions planned until budget is made available
2. Cost Accounting	• Design of the manual system by Ahn Kown and the computerization by KAIST • Work being directed toward headquarters level and not at the terminal operating companies • Design of manual system completed and submitted to KMPA for review--modifications to the system. Training and use of manual system started in 1989 • Design of computerized system will be done in conjunction with the commercial accounting system--this work being postponed due to budgetary problems • Consideration being given to providing PCTOC with the necessary budget to modify this system so that it can be used at the operating level • Plans for work at PCTOC postponed due to the decision to create a new container operating company; KMPA agrees to continue this project as part of the new information system for the operating companies (see item II A 7) • Work on the system in KMPA will be postponed until 1996 to coincide with the computerization of the accounting system

Action	Results
3. Management Information System	◦ Working by KMI and KAIST • Detailed design of PORTMIS completed by KAIST and KMA ◦ Development of the system started in 1989. ◦ Implementation at Pusan to be done before being implemented at the other major ports • System is not completed in that it does not address the information requirements of many of the port operations such as the operating terminals • Completion of Phase I of PORTMIS started in 1991--it consists of connecting three smaller ports into the systems at PDMPA--completion scheduled for 1993 ◦ Implementation of the vessel management system started at PDMPA in 01/90, implementation of cargo management system started at PDMPA in 07/90 • Work on the two remaining systems completed in 1990 and implementation at PDMPA started in late 1990 • Plans are for the final three legs to be completed by 2000; delay is due to budget restrictions
IV. CONSTRUCTION SUPERVISION	• Korean Engineering Consultants Corporation (KECC) is the prime contractor but will use foreign staff when special expertise is needed • Agreement was reached with foreign consultants - Planning Research Corporation (PRC) and personnel were assigned