7.1.4 Policy for Special Port

(1) Current Situation in Indonesia

In Indonesia, there are 1,213 special ports and wharves to handle specified commodities such as petroleum products, coal, fish, fertilizer, wood products, wheat, etc. The special port and wharves are developed and operated under the permission of MOC. These special ports and wharves are constructed, owned and operated by private companies to handle their own raw materials and products.

While IPCs control "special wharf" located in "port working area" of IPC ports, KANPEL controls "special port" located out of "port working area" and even "special wharf" are located in "port working area" out of IPC ports.

(2) Laws & Regulations Regarding Special Port and Wharf

In accordance with Shipping Law No.21 (1992), ports in Indonesia are categorized into two kinds, "public ports" and "special (industrial) ports". The former are developed to serve public & common users while the latter are developed and used by and for the interest of and to support the industries themselves such as manufacturing, forestry, fishery, mining, tourism and other sectors. The particularities of the legal aspects are summarized as follows ;

1) Shipping Law No.21

The article No.30 of the law prohibited the special port to be used for public purpose, except in a special condition under government permission.

2) Government Regulation No.70

① General Regulations

The regulation stipulates the development & operation permission of special port (§ 20～21), duties of manager of special port (§ 23～24), management of special port (§ 42), prohibition of the use for public interest (§ 45), transfer of permission for port operation (§ 47), revocation of the permission (§ 48～49) etc. The most important article is § 45.

② Prohibition of Use of Special Port for Public Interest (§ 45)

The regulation prescribes the prohibition as follows ;

(a) It is prohibited to use the special port for public interest, unless in certain conditions, with permission from the minister of MOC.

(b) Certain conditions referred to (a) could be :

a) In the case the public port is unable to perform port activities due to the limitation of the capacity of the public port.

b) In the occurrence of natural disasters or other natural phenomenon, which results in losing the function of the public port

c) In the case, there is no public port and other sufficient transportation means.

(c) The utilization of special port for public interest is only temporary, and if the public port could already function in serving public interest, the permission for utilization of special port for public interest is revoked.

3) Communication Minister Decree No.27 (1998) Regarding Special Port Management

① General

MOC issued a new Decree which regulates the management of special port in 1998. This Decree is very useful to clarify many items in respect of special port and wharf. The Decree is composed of the following matters.

(a) General stipulation (§ 1～3)

(b) Location and area (§ 4～6)

(c) License of special port building and operation (§ 7～12)

(d) Activity organizer in special port (§ 13)

(e) Operation of special port (§ 14～19)

(f) Tax rate of port affairs service in special port (§ 20～22)

(g) Dredging and reclamation in special port (§ 23～26)

(h) Obligation of special port manager (§ 27～28)

(I) Canceling of special port development and operation license (§ 29～30)

(j) Controlling and supervision (§ 31)

(k) Others (§ 32)

② Particularities of the Degree

The particularities of the Degree are summarized in the following.

(a) It is prohibited to use special port for public concern or public goods service for self purpose except in a certain condition with the MOC's minister permission (§ 16).

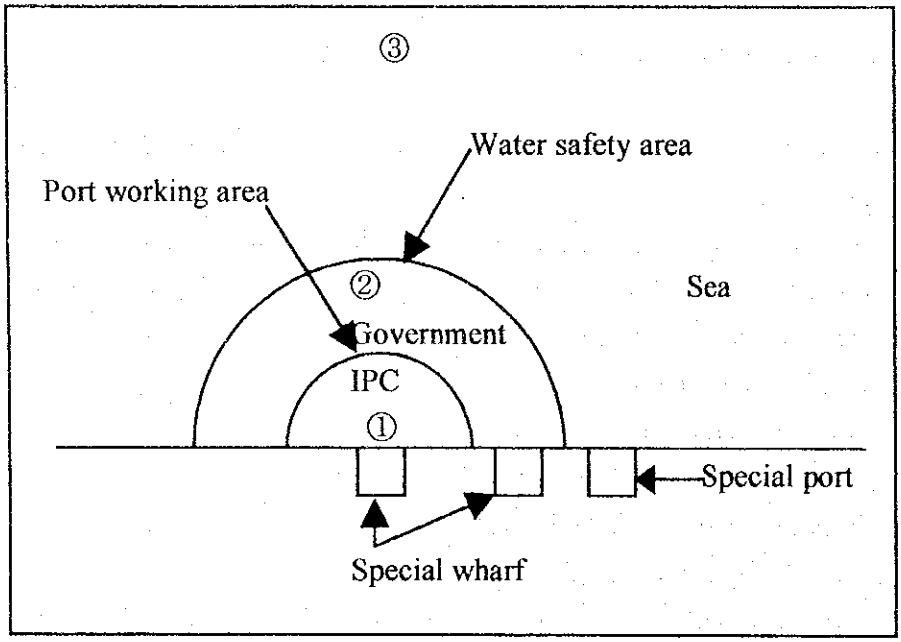
(b) "Special port" can change the status to "public port" if the requirements are fulfilled (e.g. join with IPC etc.) and then the permission is issued (§ 19).

(c) Applicants are allowed to dredge and reclaim in special port water areas by accepting the license from the minister of MOC (§ 23～26).

(3) Tariff System in Special Port & Wharf

Tariff system in special port & wharf is summarized in Chapter 6.1.2.3 (Table 6.1.2.9). Images of special port and wharf is represented in the following Figure 7.1.4.1. The tariff revenues in "a special wharf" are paid to IPC, and the revenues in "a special port" are paid to the government. The tariff revenues are spent for management of the area, maintenance dredging & others.

Figure 7.1.4.1 Image of Special Port and Wharf



(4) Administration Policy to be Carefully Examined

1) Tariff Issue

① Justification of Tariff Levy

Except for "anchorage", it seems difficult for the government or IPC to justify collecting "berth dues" and "wharfage" from users of special ports because "no service" usually means "no charge". Furthermore, the amount of some tariff in "special wharf " is determined on "negotiation base" between IPC and private sector. Besides, the relationship between the tariff revenue and the expenditure for management is unclear.

In Japan, port management body doesn't collect port tariff from owners or users of special ports because they construct special ports at their own cost. Besides, inducement of the private sector into the public port area has been important strategy for Japanese

public sector. However, they are often required to share the cost of "infrastructure development" in accordance with degree of the benefit they receive based on "clear legal framework" and "transparent procedure" (see Chapter 6.1.2.3).

② Tariff Issues in "Special Wharf"

In special wharf within "non-commercial (government) port", the port charges are paid to IPCs at present. However, the tariff should be paid to the government. There is a danger that allowing this kind of privilege for IPC makes its nature mere "rent seeker".

2) Discouragement of Development of Special Wharf

In Indonesia, the development of "special wharf" in adjacent to "public port" is more and more required in order to promote effective regional development. However, there are following two factors which discourage the development

① The above-mentioned tariff issues and the nature of IPCs prevent most of the private sector from locating in the jurisdiction of IPCs (special wharf).

② The "Shipping Law No.21" and "Government Regulation No.70" require the private sector to cooperate with IPCs. Thus, the private sector must obtain the permission from "IPCs" as well as the government. In this case, various kinds of conditions are forced to the private sector.

There is a danger that the excessive intervention of IPCs discourages the development of special wharf within IPC's jurisdiction. Therefore, the government should take pains to justify collecting the port charges, eliminate the obstructed causes and reevaluate the compulsory legal requirement (see Chapter 6.3.2). Otherwise, it is one idea to legitimate "cost-sharing with beneficiary" in place of tariff levy system (see Chapter 6.1.3.2 Cost sharing system with beneficiary).

3) Utilization of Special Port & Wharf

The image of utilization of special port and wharf is referred to in the following Figure 7.1.3.2 (case 1) & 7.1.3.3 (case 2).

Case 1 : Development of " a new public port" adjacent to "an existing special port"

Case 2 Introduction of " a special port (wharf)" adjacent to " an existing public port"

The concept of "Case 1" aims to develop the port area effectively by developing public ports including development of the "concerned industrial sites" adjacent to special port. On the other hand, that of "Case 2" aims to promote efficient use of public ports in the region

and create a large-scale "industrial zone" based on the public and special ports.

4) How to Determine a Border Line between "Port Working Area" and "Water Safety Area"

At present, the borders between "port working area" and "water safety area" are determined by the negotiation between DGSC and IPC. It is necessary for the government to establish the clear and transparent criteria how to determine the line. DGSC is now formulating a clear "guideline" in order to cope with this.

5) Documentation Problems

According to Communication Minister Decree No.27, manager of special ports must submit the operational report including data of cargo volume to DGSC every month (article No.28 (1) g). However, in reality, only a few reports are sent to DGSC. DGSC has just introduced computerized "data-base system" in order to enrich the necessary information regarding special port & wharf. .

"General explanation of special port in Japan" and "example of Kashima port in Japan" is referred to in Appendix for Chapter 7.1.3.

Figure 7.1.4.2 (Case 1)

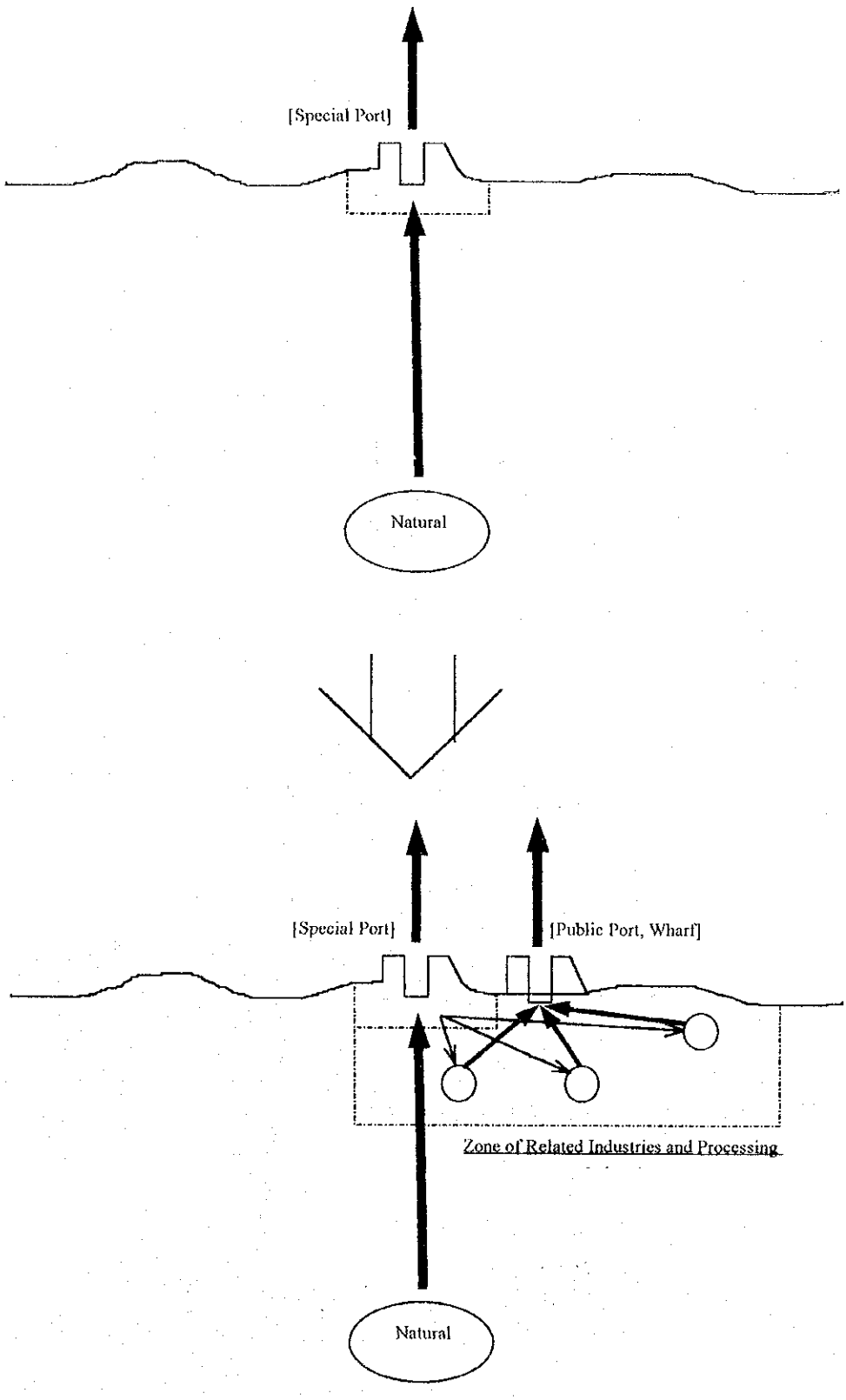
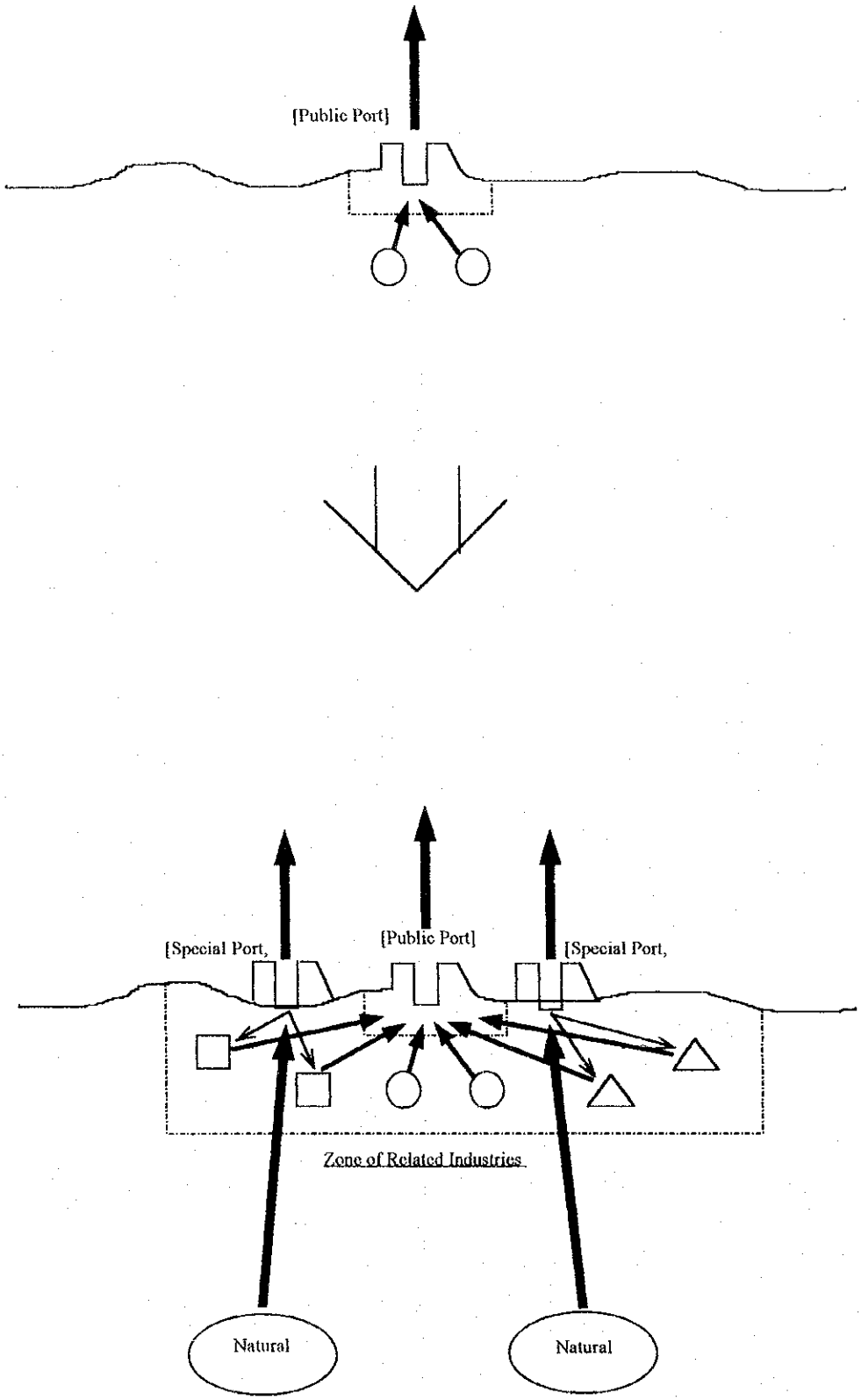


Figure 7.1.4.3 (Case 2)



(5) Recommendation

Taking account of the above-mentioned matters, the following recommendation can be made.

1) In special wharf within "non-commercial port", the port charges should be paid to the government which bears the cost for management of the area.

2) The government should strive to justify collecting the port charges, eliminate the obstructed causes and reevaluate the compulsory legal requirement. Otherwise, it is one idea to legitimate "cost-sharing with beneficiary" in place of tariff levy system.

3) Effective utilization of special port & wharf should be carefully considered. For example, the development of "a special wharf" in adjacent to "a public port" will be more and more required to promote effective regional development. In order to do so, the government should strive to remove the above-mentioned obstructed causes which discourage the effective regional development.

4) The government should also establish clear and transparent criteria how to draw the border line between the "port working area" and "water safety area".

5) DGSC shall give appropriate instruction to the managers of special port & wharf through supervision of local regional office to let them submit the operational reports every month to DGSC.

7.1.5 Transfer of Competence

Along with the advancement of economy, the demand on port administration would increase more and more in order to cope with the increase and diversification of cargo, to improve the efficiency of port operation and to conserve the environment of port, etc. That would considerably increase the volume of port affairs concerned with the legal system, policymaking, port planning, finance and so on. At present, DGSC is responsible for many affairs related to port management including tasks that could be handled more effectively by individual local governments. Table 7.1.5.1 shows the sections responsible for port administration at present. Table 7.1.5.2 gives an evaluation of the present circumstances.

In coming years, the central government should concentrate on administrative affairs such as policy making or decision-making concerned with all ports. On the other hand, actual port management or operational works of local or non-commercial ports should be entrusted to local government as much as possible.

Local governments should be self-governing entities. The relationship between the central government and local governments should be founded on the principle of cooperation and minimum intervention. The central government is expected to render technical advice and financial support, etc. with minimum control over the local governments. People Consultative Council of the Republic of Indonesia(MPR) has established three decrees in order to realize the fair arrangement, distribution and utilization of national resources, to balance central and regional finances and so on. The decrees are MPR's Decree No. X /MPR/1998 regarding Major Development Reforms to Assist and Normalize the Lives of Citizens, MPR's Decree No. X V /MPR/1998 regarding Regional Autonomy and MPR's Decree No. X VI/MPR/1998 regarding Economic Democracy. The ideal relationship between central and local government needs to be realized based on the concepts of these decrees.

Of course, to achieve a nationwide well-balanced development of ports, it is necessary for central government to exercise certain control over local governments. For instance, demarcation of port administrative area (DLKR or DLKP or certain area like Japanese waterfront area, etc. Outline of harbor limit and waterfront area in Japan is shown in A 7.1.1.) needs to be conducted by central government organ such as MOC or DGSC. This is because the port administrative area must be coordinated with boundaries, adjacent ports, city planning, coastal administration and various concessions such as fishery or mining. The port administrative area needs to be approved by the central government organ provided that it is consistent with other port master plans, regional development plans and national policy.

In future, the function of DGSC should be centered on such tasks so that the expanded affairs related to port management can be conducted well.

To ensure such a system, needless to say, the establishment of a legal foundation and reinforcement of local functions are indispensable. The port is important infrastructure

supporting national life and economy. In addition, the port is a part of larger national system involving various activities, infrastructures such as roads, railroads and rivers, etc., industrial developments and so on. Therefore, local governments should have skills enough to manage the ports through the coordination of all matters related to port administration. Local governments need to heighten their abilities toward the era of decentralization. In this sense, the development of human resources is a crucial factor as well as the establishment of legal basis.

On the basis of the above concept, it is expected that the competence of port administration and management in Indonesia would be well allocated in conformity with prevailing customs and national conditions. Table 7.1.5.3 and 7.1.5.4 show the ideal system of port administration in the future. Table 7.1.5.5 and 7.1.5.6 show the provisional ideas for the middle term.

Table 7.1.5.1 Responsible Parties in Present Public Port Administration System

Item	Central Government	Local Government	Private Sector
Legal affair	○	—	—
National Policy Making	○	—	—
Regional Policy Making	○	△	—
Port Master Plan	△	—	○
Port Administrative Area	○	—	—
Financing	△	—	△
Construction	—	—	○
Management	—	—	○
Tariff	○	—	—

Note : * ○;main responsibility, △;partial responsibility, —;not responsible, * Central Government includes KANWILs and KANPELs, * Private Sector includes IPCs

Table 7.1.5.2 Evaluation of Present Public Port Administration System

Item	Central Government	Local Government	Private Sector
Legal affair	△	—	—
National Policy Making	△	—	—
Regional Policy Making	△	△	—
Port Master Plan	△	—	△
Port Administrative Area	△	—	—
Financing	△	—	△
Construction	—	—	○
Management	—	—	○
Tariff	○	—	—

Note : * ○;acceptable, △;insufficient, —;not conducted, * Central Government includes KANWILs and KANPELs, * Private Sector includes IPCs

Table 7.1.5.3 Future Public Port Administration System (for Class AA to D)

Item	Central Government	Local Government	Private Sector
Legal affair	○	△	—
National Policy Making	○	—	—
Regional Policy Making	—	○	—
Port Master Plan	△	△	○
Financing	—	—	○
Construction	—	—	○
Management	—	—	○
Tariff	—	—	○

Note : * ○; main responsibility, △; partial responsibility or participation,
—; not conducted
* Central Government includes KANWILs and KANPELs
* Private Sector includes IPCs

Table 7.1.5.4 Future Public Port Administration System (for Class E)

Item	Central Government	Local Government
Legal affair	○	△
National Policy Making	○	—
Regional Policy Making	—	○
Port Master Plan	△	○
Financing	○	○
Construction	—	○
Management	—	○
Tariff	—	○

Note : * ○; main responsibility, △; partial responsibility or participation,
—; not conducted
* Central Government includes KANWILs and KANPELs

Table 7.1.5.5 Public Port Administration System in the Middle Term (for Class AA to D)

Item	Central Government	Local Government	Private Sector
Legal affair	○	△	—
National Policy Making	○	—	—
Regional Policy Making	△	○	—
Port Master Plan	△	△	○
Financing	△	—	○
Construction	—	—	○
Management	—	—	○
Tariff	—	—	○

Note : * ○; main responsibility, △; partial responsibility or participation,
—; not conducted
* Central Government includes KANWILs and KANPELs
* Private Sector includes IPCs

Table 7.1.5.6 Public Port Administration System in the Middle Term (for Class E)

Item	Central Government	Local Government
Legal affair	○	△
National Policy Making	○	—
Regional Policy Making	△	○
Port Master Plan	△	△
Financing	△	△
Construction	△	△
Management	—	○
Tariff	—	○

Note : * ○; main responsibility, △; partial responsibility or participation,
—; not conducted
* Central Government includes KANWILs and KANPELs

7.2 Formulation and Authorization System of Port Master Plan

7.2.1 Significance of Port Master Plan and Its Nature

(1) Significance of Port Master Plan

Planning for port development in particular is absolutely essential because of its unique nature and surroundings as indicated here below.

1) The construction of ports normally requires a large investment of funds over a very long time span because it must often be conducted under complicated and harsh natural conditions. Systematic provision of right quantity of facilities is, therefore, the most important requirement for reasonable realization of a port development project.
2) Ports have close relation to the regional, national and international economic activities. In this respect, it is essential that port services be offered under careful planning so that they can support these activities and generate overall prosperity.
3) Ports can not play their roles without proper connection with inland transport facilities such as roads and railways. This implies that the systematic development of such facilities can not be realized under absence of a comprehensive port plan.
4) Ports are always requested to fulfill many requirements from various parties concerned including local residents and port users as well as representatives of economic, industrial and administrative organizations. Port planning process is indispensable in exchanging views and opinions with these parties so that their opinions can fairly be reflected and incorporated in the port development plan.
5) It is almost impossible for the port management bodies to conduct proper port operation and management activities without definite port plan which can provide them with specific guidelines for such essential activities. (In this sense, it is considered appropriate that a port management body be a proponent and a responsible entity of the port plan as a port planning body.)

(2) Basic Nature of Port Master Plan

Port stimulates its own future demand with accumulation of facilities and increase of use. As a result, the port obliges itself to develop further. Hence, a port plan which considers not only immediate demand but also the most likely long-term scenario should be established and made public. The port can then be developed efficiently according to such a plan.

The type of port plan varies widely according to its object, time or geographical coverage, and port planning body. With respect to geographic or target wise category of port plan, it is generally divided into two types. One is national port plan and other is individual port plan. A national port plan covers an entire system of ports located in a country, while an individual port plan covers affairs of a particular port. Between the above two port plans,

regional level port plan is also considered useful under certain circumstances in case that there are other adjacent plural ports, large-scale industrial development depending on several ports or extensive hinterland economically affected by the port development, etc. Port plans need to be reviewed periodically and revised when necessary.

As for the time coverage of a port plan, there are many choices from short-term to long-term. In actual port plan, 5-7 years future is normally selected as short-term and 10-20 years for long-term plan in which a master plan is generally categorized. This chapter will mainly deal with the long-term individual port master plan.

Although all public ports should have their own port master plan in principle, master plans for major ports should be prioritized. A short-term plan for actual port development which stipulates concrete facilities, administration methods, finance and implementation schedule, etc. should be also established based on the master plan.

(3) Function of Port Master Plan

Regional growth can be realized by responding to various regional demands. Port master plan must be able to meet these regional demands in the future. It should serve for systematic integration of various demands and harmonized formation of a future superior port space.

Needless to say, the role of port is not limited to the local area. Port must contribute not only to regional growth but also to national economic growth through well-balanced development across the nation, and to the establishment of a comprehensive transportation system. Port occupies surface space from where various activities extend to a wider area. Port mostly forms a part of an urban area, where plural administration bodies carry out various activities. For systematic port development and proper management, it is very important to coordinate with other policies such as land use plans in surrounding areas.

Port master plan is to be the framework for realizing the ideal port condition. Establishment of an adequate port master plan might attract various related facilities and facilitate cooperation with other parties.

(4) Objectives of Port Master Plan

The objectives of port master plan are summarized as follows.

1) to be a guideline of long-term investment and operational improvement scheme for the target port
2) to be a base for shot-term development plan of which contents are required to be consistent with total development scheme.
3) to provide port users, investors and other business entities concerned with future prospect of business environment and thus to guide the business behavior of private sector in proper direction consistent with the port development.

4) to promote harmonized development of other infrastructures necessary to realize the proposed port development scheme.
5) to be a component of national port plan so that the future development of the target port can appropriately be coordinated with the overall concept of national port development.
6) to be a base for consideration of various financing agencies in their investment or financial assistance plan.

(5) Applicability and Practicability

In order to secure applicability and practicability of the port master plan, the following requirements of its functional position should be considered by planners or planning bodies.

1) Time span of the plan should correspond to other long-term national or regional economic development plans.
2) The plan should be flexible enough to adjust to possible future contingencies.
3) The plan should be vested with a certain legal power or be authorized by the government to promote its development scheme.
4) Easy access to the contents of the plan should be secured for the interested parties concerned.

The establishment of a port master plan naturally involves certain costs and planning technology. To secure the establishment of a port master plan, the government may need to assist financially or technically the port planning bodies as the proponents of the plan.

7.2.2 Institutionalization for Authorizing Port Master Plan

(1) Scope of Port Master Plan

The scope covered by port master plan should include all land and water area desirable to be considered for development, use or conservation. Port is a key node and a vital base for supporting distribution, industry and livelihoods. Therefore, port master plan should be composed with careful consideration on various relevant factors including potential expansion requirement, socio-economic activities in hinterland, natural conditions of areas in and around the development site, functional relation to surrounding ports, environmental conservation and so on. The proposed master plan can then ensure sound future function of the target port.

Provisions of port master plan should contain planning of special wharves, ferry port, navigational channel and other related facilities which would fall under the same port administrative area (DLKR: port working area, and DLKP: port safety area in Indonesia). As described above, the port master plan should be so comprehensive that planning procedure

needs to be institutionalized in close cooperation with other related organs and parties concerned. While unification of port planning concept and procedure should be maintained, this does not mean that all relevant port facilities must always be developed and managed by one single organization. The concept implies that individual facilities could be developed and operated separately by the different management bodies, if appropriate according to nature of the facilities.

(2) Port Planning Body

Port should first serve to satisfy local needs of its hinterland as well as regional and national requirements as a final target. It is therefore desirable in principle that the port master plan is originated by the individual "Port Management Body (PMB)" which is responsible in promoting their regional prosperity through planning and developing ports in their region, and therefore be responsible in port planning as a "Port Planning Body(PPB)". The national port master plan is normally formed referring to these individual port master plans in accordance with the nationwide port policy and requirements as well.

The policy on port planning proponent suggested in this section implies that combination of so-called top down and bottom up system of planning is most appropriate for port sector development in Indonesia with many islands of which port development demands are scattered over wide range of variety. In other words, only top down oriented way of port planning is considered not appropriate in this country.

(3) Authorization of Port Master Plan

Before a port master plan is officially authorized, the draft plan must be understood and agreed upon by the various parties concerned. Opinions from government agencies, local people, users and people of academic fields should be invited and reflected in the master plan accordingly.

In Japan, the Central and Local Port Council have been established. They are to investigate and discuss the draft plans on the important items including basic port policy, development of port facilities, financing and management affairs. Port master plan must be approved by these councils as a part of authorization procedure.

While the above mentioned Japanese system is not always applicable to other countries, it may be useful in streamlining port planning administration to introduce a similar system to Indonesia. If permanent establishment of such a system would be difficult under current Indonesian situation, an alternative organization with similar function needs to be set up even on an ad hoc basis so that opinions from various parties could be fairly reflected in official port master plans and thus smooth and reasonable port development could be realized. Outline of Japanese port planning procedure and preliminary ideas of procedural flow for Indonesian port planning are shown in Figures 7.2.1, 7.2.2 and 7.2.3(a) and (b)(as

Figure 7.2.1 Port Planning Procedure in Japan

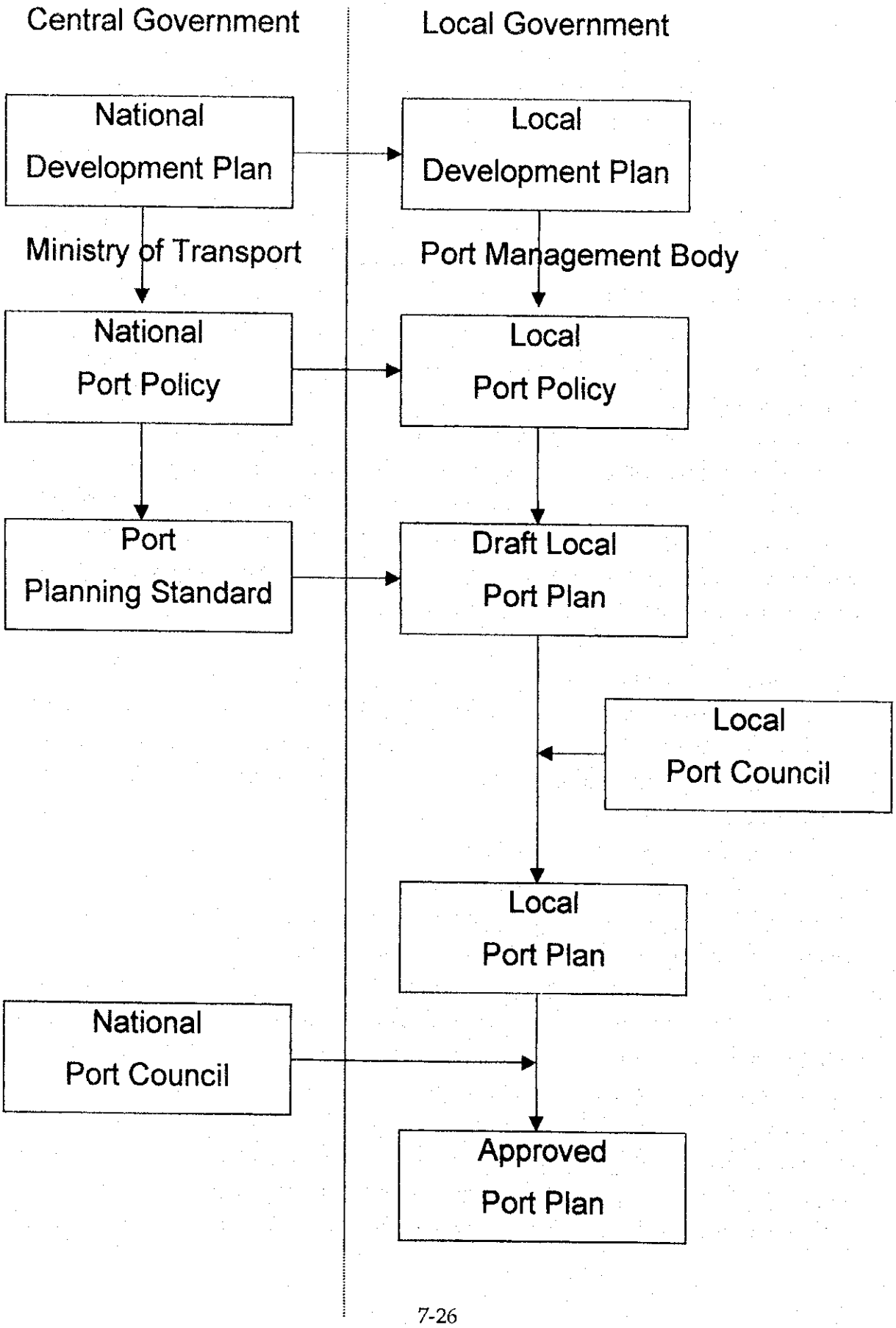
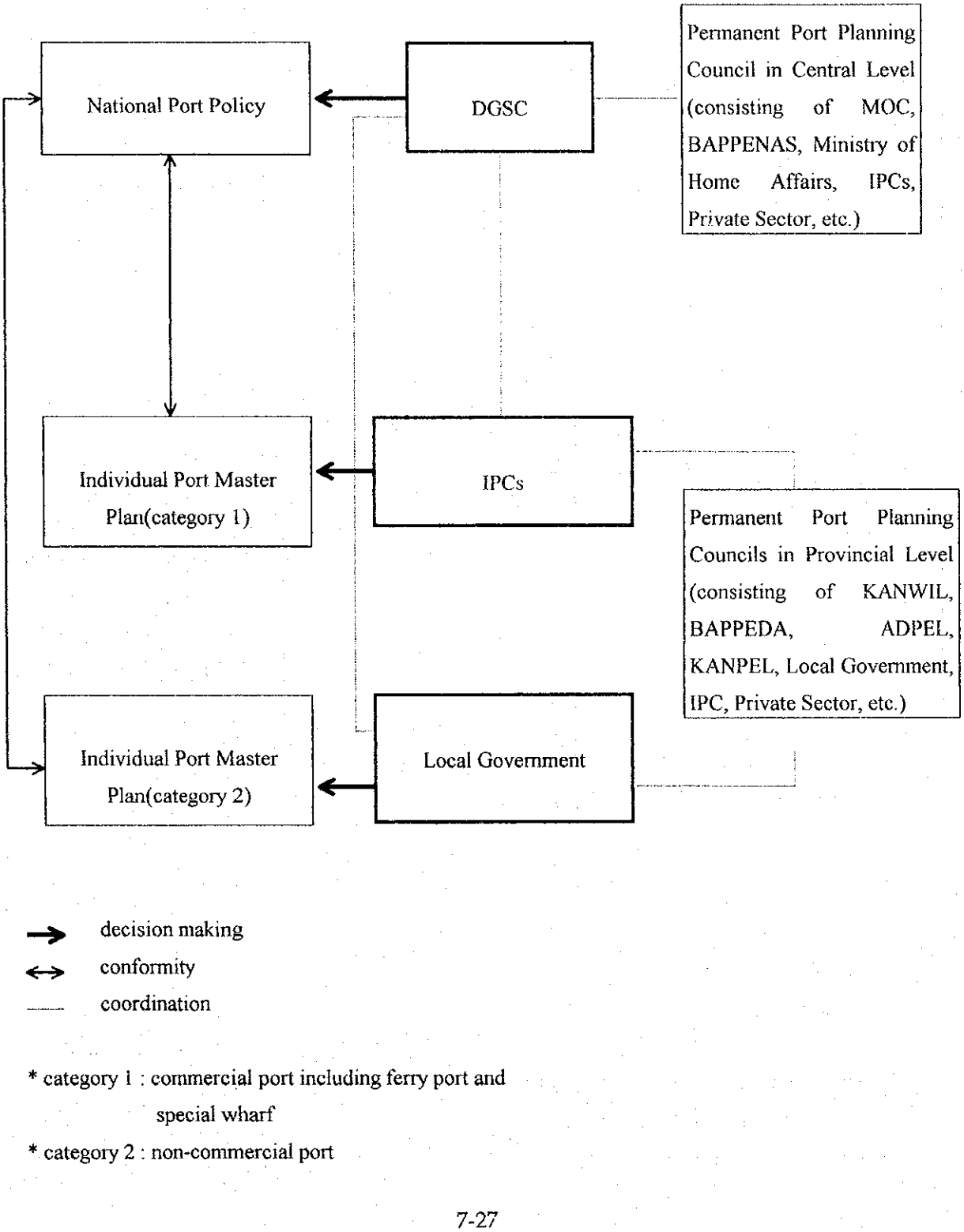


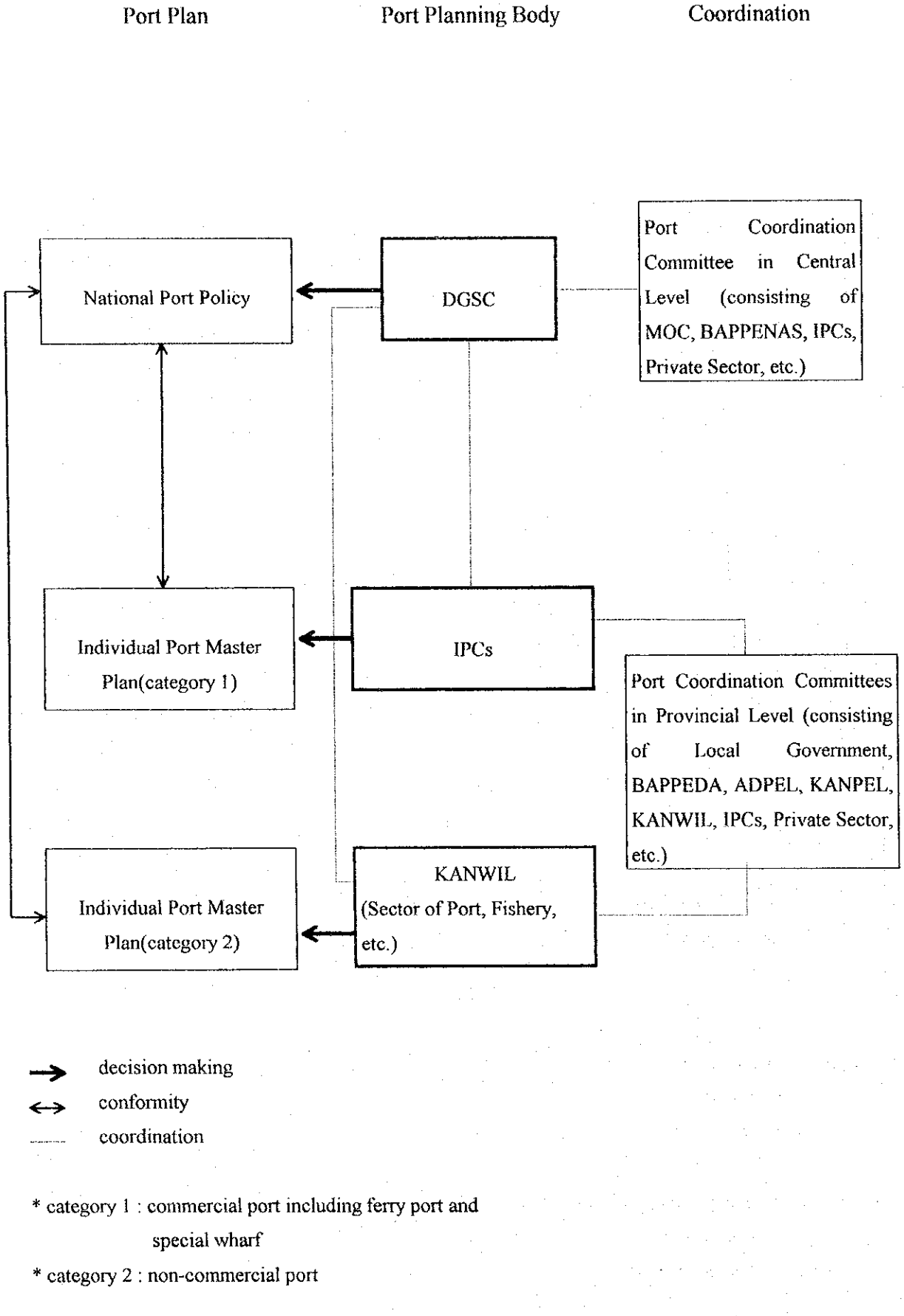
Figure 7.2.2 Port Master Planning System



* category 1 : commercial port including ferry port and special wharf

* category 2 : non-commercial port

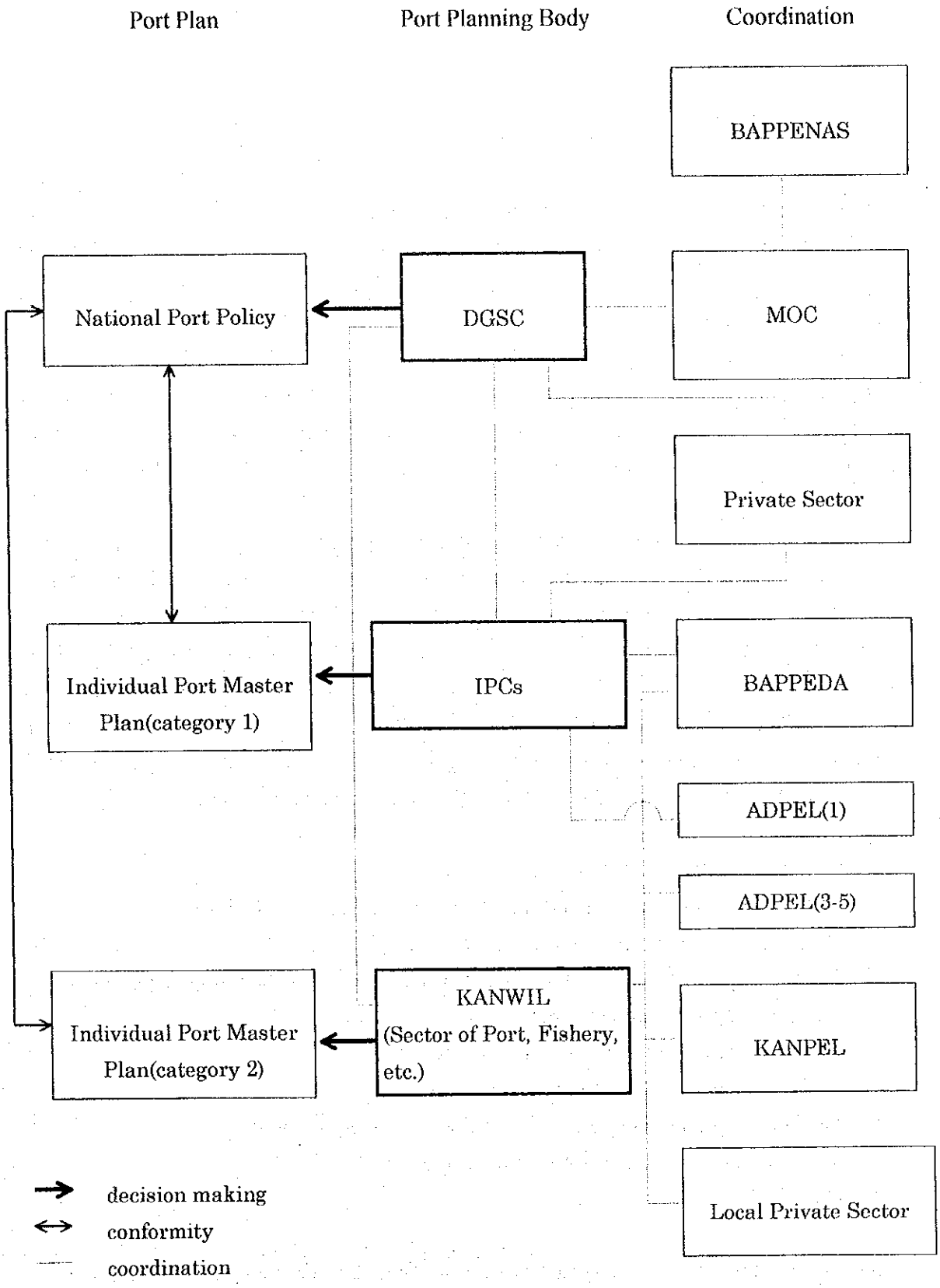
Figure 7.2.3(a) Port Master Planning System (Alternative A)



* category 1 : commercial port including ferry port and special wharf

* category 2 : non-commercial port

Figure 7.2.3(b) Port Master Planning System(Alternative B)



* category 1 : commercial port including ferry port and special wharf

* category 2 : non-commercial port

tentative systems) for consideration and further examination of DGSC.

7.2.3 Standardization of Port Master Planning

(1) Standardization of Port Planning Factors

In order to secure high applicability and practicability of port master plan to every type of port development schemes of the country, it is necessary to have a nationally unified standard for port planning factors, which includes basic planning objectives and method, cargo traffic demand forecast, type and size of port facilities and ships calling, port capacity estimation, investment requirements and cost allocation, port environmental standards and assessment, and so on. Since quality of port plans is mostly controlled by the above port planning standards, they should be established under detailed analyses and careful consideration on the actual conditions (natural, social, economic, institutional, technological and local) of the respective country and internationally accepted standard as well.

The overall quality standard of port planning could be assessed by its compatibility with other major national/regional plans. Since individual port master plans should be a part of total transport infrastructure plan which is also supposed to be a component of national development plan, any contradictions in their concepts, objectives or estimated scale of physical targets and so on should not exist among those plans. The total planning system of national development is composed of many different types of plan ranging from an individual local plan to comprehensive national plan. In this sense, port planning standards are requested to be enough compatible with other relevant planning standards.

(2) Composition of Port Master Plan

Major items to be stipulated in port master plan are generally as follows.

1) Basic policy, objectives and target year of port plan
2) Estimated port capacity in target year in terms of cargo handling requirement and number and size of ships calling
3) Required scale and layout of major port facilities
4) Environmental impacts of port development
5) Land use of direct hinterland and additional land requirement
6) Water use and additional water area requirement
7) Others

While the details of sub-categories of each items should be decided according to local conditions and its special requirements, the Japanese standard is shown for reference in Table A 7.2.1 which is decreed by the port and harbor law.

In Japan, in the step of making up the port master plan, an environmental impact assessment must be implemented. The EIA in the port master plan is to predict/evaluate the extent and range of impact on the environment and includes countermeasures for environmental conservation. These predictions and evaluations are executed concerning the impacts caused by operation work. Impacts from existence and construction work of port are separately assessed based on other individual laws and regulations.

7.3 Improvement of Port Operation

International shipping lines are operated on extremely tight schedules under the hard competitive shipping market. Delay on the schedule causes a heavy cost burden to the shipping lines. As a result, the terminal operators are always requested to provide shipping lines with quick dispatching service for vessels arrived at the port. Berthing arrangements and preparatory actions for cargo handling operation (berthing plan, loading and unloading sequence, allocation of cargo handling equipment and stacking lots of containers, and so on) for the calling vessels should be completed well before their arriving at a port. Preparation of documents should also be done before the vessels' arrival, and the terminal operators are required to provide shipping companies with punctual operations not to interfere with shipping schedule.

Since the issues on port operation productivity are most critical on almost every type of cargo handling including international marine containers and conventional cargoes, the discussions on this subject are focused on the ports of Tanjung Priok and Tanjung Perak which represent the most busiest ports in Indonesia in this regard.

7.3.1 Management of Terminal

(1) Conventional terminal management at the port of Tanjung Priok

The eleven conventional cargo terminals of Tanjung Proik are separately operated under contract basis by eleven different terminal operating consortiums composed of several selected stevedoring companies that are mostly owned by major shipping companies of Indonesia. Under this system, the shipping lines calling at the port tend to select the particular terminal where their own stevedores are assigned. While this system may be considered convenient and economical for the shipping companies, which have their own sister stevedoring companies assigned to a terminal, upgrading of overall productivity of the conventional cargo terminals could not fully be expected under the system, mainly because this may discourage free and flexible berthing of all calling vessels including the ones of shipping companies which dose not have their own stevedores at any terminals of the port in particular.

It may be worthwhile to increase terminals, which is not on the current practice of the terminal operators system. So that any stevedores shall allow to participate in operation of terminals regardless of their business connection with shipping lines for fair and efficient cargo handling operation. Since the port of Tanjung Priok is the most busiest one in Indonesia, and therefore various attempts for fair and efficient cargo handling operation need to be conducted without any disturbance of actual cargo handling, the trial measures such as the

above idea should be introduced accordingly.

Stevedoring workers are supplied from the labor union through ADPEL-1. This system often jeopardizes timely and adequate provision of well trained workers for reliable and stable stevedoring activities. Direct procurement of the workers from labor market shall be allowed for further increasing cargo handling productivity.

(2) Container terminal management at the port of Tanjung Priok

Under the current practice of IPC-II, the container vessels can use its allocated berthing space on the contract basis according to fixed weekly berthing plan. From the terminal operator point of view, the curent system may be desirable in terms of securing easy container handling arrangements for labor force or equipment as well as securing stable income structure, when the calling vessels are mostly operated on liner service basis. The vessels out of the contract, however, can not berth at the terminal in principle which implies that full utilization of potential capacity of the terminal could not be expected under the system. Introduction of so called first come-first serve system may be one of the possible alternatives for more flexible use of the available berthing spaces of the terminal.

Effects of monopolistic nature of the current practice and possible counter measures against this need to be discussed, since the subjected is a more basic and crucial aspect of operational system of the container terminal. In fact, CT-I and CT-II are operated directly by IPC-II, and CT-III is operated by a private terminal operator, nearly half of which stock is held by IPC-II. While the original objective of privatizing state owned PT. PELINDO was to realize a competitive market oriented system in port operation business, the current system is not considered successful in this regard, mainly because these three terminal are not working under full competitive conditions.

Although it is no easy task, under the actual situation, to create a perfect competitive business field for three terminals of the port, following suggestions may be helpful in improving the current semi-monopolistic conditions of port operation.

1) The basic concept of the idea is to remodel three container terminals (CT-I, II, and III) into three semi-independent terminal operating entities (hereinafter referred to as TOEs) or sub-sections of which positions are still under overall management of IPC-II.

2) In order to maximize incentives in achieving high cost performance of terminal operation, each TOE is allowed to hold an independent accounting system with their own benefit sharing rules among the various parties concerned including the headquarter of IPC-II and management and workers of TOE.

3) The infra and superstructures already developed or installed at each terminal shall be leased out at appropriately estimated rental rate under a fixed term (say 5 to 10 years) contract agreed by IPC-II and TOE.

4) TOE shall operate this terminal by labor force from competitive labor market under own policy and operational strategies freely to maximize its operating gains.

5) The rental rate of the facilities shall be adjustable so that minimum reasonable operating benefit of TOE could be maintained.

6) Any intervention of IPC-II headquarter or DGSC should not be allowed for TOE's policies and decisions except for the case of miss-conformity with the contract or basic regulations of the government so that free business competition among the terminals can be ensured.

While the above suggested system is still in very preliminary stage and subject to detailed examination of DGSC and IPC for actual application to the Indonesian port sector, it may be worthwhile to refer the facts that the similar systems have been adopted in some large private firms in the world which have many different sub-sectors competing each others under a same umbrella of the headquarter.

(3) Conventional terminal management in the port of Tanjung Perak

The cargo handling operation at the conventional terminals in the port of Tanjung Perak are conducted by the private stevedoring companies designated by shippers or consignees. Since this system is considered well working in general at least in the light of encouraging free entry and competition of private stevedoring companies, any serious structural weak points are not observed in this regard.

Considering the possible future trend of loading/unloading system for conventional cargoes in this region, however, following points regarding provision of cargo handing equipment need to be examined for improving cargo handling productivity.

1) While the substantial portion of conventional cargoes in this port are currently handled by using the ship gears, this type of operation would gradually be decreased in accordance with growth of total cargo volume and size of the vessels as well as progress of modernization of the feet to be used in this area.

2) Considering the above trend, the number, size and types of required on-land cargo handing equipment would be increased or diversified accordingly, which implies that the current

system for providing the private stevedores with cargo handling equipment will jeopardize higher cargo handling performance of the port.

3) On the basis of the above conditions, it may be recommendable that the private stevedores should hire equipment from competitive lease companies rather than hire it from IPC III under real competitive condition, so that responsible provision and maintenance of equipment could be ensured. This makes the private stevedores more independent from IPC and thus promotes operational efficiency of the terminals through free and fair competition among the companies.

4) In order to enjoy the expected effects of the policy, however, it is necessary to upgrade the total capability (scale, man power, financial position, reliability and so on) of the stevedoring companies, which may need positive assistance of the relevant agencies including IPC, DGSC, ADPEL-I which issues official approval on assignment of the private stevedoring workers to actual cargo handling activities on site.

(4) Container terminal management in the port of Tanjung Perak

The container terminals ICT-I and ICT-II of this port are generally well operated on first come – first serve basis, which is considered appropriate for these terminals. The operating system for a new combination terminal of ICT-II and ICT-III, however, needs to be critically examined considering the following factors.

1) ICT-III is to be owned and operated by a private entities, while ICT-II is operated directly by IPC-III. Well coordinated operational policy of both terminals should be considered, if possible, for maximizing advantages of the continuous berth.

2) Since construction of the second trestle bridge has been canceled, the narrow and long shape of the extended terminal with the only one existing trestle bridge attached at its one end may jeopardize smooth and efficient transfer of containers.

3) In order to win future hard competition with other Asian container ports, operation performance of the terminals need to be improved up to its maximum capability, through various measures including expansion of the existing container yard if necessary and possible.

7.3.2 Procedure of Documentation

The "one roof center" system is employed in the port of Tanjung Priok, the port of Tanjung

Perak and other ports. This system provides users with convenient services in the ports. The system and procedure of ships and loading/unloading goods service are as follows;

The shipping company submits the "original document of ship commodities service request" to the "one roof service center" to establish the ship's mooring, loading/unloading and stacking plan. After receiving "ship and commodities service request establishment", the "one roof service center" submits "duplicate document of ship and commodities service request establishment" to the Harbor Master, Customss, Immigration, Quarantine, Shipping Company and a stevedoring company. The ship's mooring is done after the ship clear quarantine. The stevedoring company load/unload cargoes. Ship goes out after getting the sailing permit from the harbormaster.

EDI system is employed in the port of Tanjung Priok and Tanjung Perak. The EDI system of the port of Tanjung Priok is connected with all organizations of the IPC II, CIQ offices, banks, shipping companies, shippers and consignees. The EDI system of the port of Tanjung Perak is connected with all organizations of the IPC III and banks, but it has not been connected with CIQ offices and other organization concerning to the maritime transportation. Introduction of an EDI system for customs are being studied by the customs office. The EDI system is planed to connect with the EDI system of the IPC III.

Other major ports opened to the world should employ "one roof service center" system for relieving users from bothersome involved in dealing with multiple agencies.

Other ports should employ the EDI system connected with all organizations concerning to the port industry to relieving paper handling and to realizing faster information exchange.

7.3.3 Productivity of Cargo Handling

High productivity of cargo handling corresponding to partner ports should be realized in order to provide users with high quality services without further investment in facilities in the terminal.

(1) Productivity of conventional cargo handling

Table 7.3.3.1, Table 7.3.3.2 and Table 7.3.3.3 show the utilization of facilities, service time for vessels and productivity of cargo handling at conventional terminals in the port of Tanjung Priok in 1997 respectively. The utilization of facilities seems to be appropriate, but the service time of vessels are too long, waiting time and should be decreased especially. To realize short waiting time, the berthing planning should be made coordinating with vessels plan, productivity of cargo handling should be raised.

Table 7.3.3.4, Table 7.3.3.5 and Table 7.3.3.6 show the utilization of facilities, service time of vessels and productivity of cargo handling at conventional terminals in the port of Tanjung

Perak in 1997 respectively. The same evaluation as the conventional terminals at Tanjung Priok can be made on this port.

(2) Productivity of container terminal

Table 7.3.3.7, Table 7.3.3.8 and Table 7.3.3.9 show the utilization of facilities, service time for vessels and productivity of cargo handling at container terminals in the port of Tanjung Priok in 1997 respectively. The utilization of facilities are very high, especially BOR in CT I. To reduce the BOR, berthing plan should be made considering vessels' operation plans. Productivity of container handling does not reach to the theoretical productivity of quay container cranes. To bring the productivity close to the theoretical one, planning of loading/unloading should be worked out considering other equipment planning.

Table 7.3.3.10, Table 7.3.3.11 and Table 7.3.3.12 show the utilization of facilities, service time for vessels and productivity of cargo handling at container terminals in the port of Tanjung Perak in 1998 (January – July) respectively. The utilization of facilities remains within appropriate level. Waiting time should be reduced especially. To reduce the service time, berthing plan should be planed with careful consideration of vessels plan. Productivity of container handling is not so bad. To achieve higher productivity, planning of loading/unloading should be worked out considering other equipment planning.

(3) Result of site survey on container handling productivity

Table 7.3.3.13 and Figure 7.3.3.1, Table 7.3.3.14 and Figure 7.3.3.2 show the result of site survey on container handling productivity in the Tanjung Priok container terminal. The survey was conducted in the Tanjung Priok container terminal I, at the berth number 3 by the study team. The target vessel was Ming Union on the way to Surabaya from Korea. The objective container cranes were CC3 (theoretical productivity is 31 boxes/crane/hour, built in 1983 and installed in 1984) and CC4 (theoretical productivity is 34 boxes/crane/hour, built in 1988 and installed in 1989). In the survey, container cranes CC3 recorded productivity of 22.7 boxes/crane/hour, and CC4 recorded 24.2 boxes/crane/hour. Measured productivity of container handling of CC3 and C4 are better than an average productivity(18 boxes/crane/hour).

Some cases are observed that quay cranes wait trailers mainly due to lack of drivers. To be a world competitive container terminal, the terminal should achieve short service time without any waiting time. For above reason, quay container cranes should have priority in handling operation, and should not wait chassis trailers. The IPC II should have sufficient trailer drivers for operate quay container cranes efficiently.

(4) Result of the site survey on productivity of cargo handling

The study team conducted site survey on bag, box, crate and steel plate handling in the port of Tanjung Perak.

1) Bag cargo

Survey on cargo handling productivity is conducted at the West Jamrud terminal, the berth number 9 and objective vessel is Taruna Putra III. Tamarind and brown sugar in bags and natural fertilizer in bags are handled by ship gear no. 1 (2.5 ton), and gear no. 2 (2.5 ton) respectively. The cargo was loaded from truck to the deck of the vessel directly using 4 truck laborers, 1 foreman and 4 ship laborers. Measurement for ship gear no. 1 was conducted for 7 hours and 49 minutes including working time of 7 hours and idle time of 49 minutes. Measurement for ship gear no. 2 (2.5 ton) was conducted for 7 hours and 29 minutes including working time of 4 hours and 40 minutes and idle time of 2 hours and 49 minutes.

(a) Ship gear no. 1

Cargo handling time was 7 hours and 49 minutes (start time: 13:23, finish time: 21:12). Total cargo handled was 67.85 ton. Overall handling productivity iwas 8.68 ton/gang/hour.

a) Tamarind

Cargo handling time was 1 hour and 41 minutes. Cargo volume handled was 30.6 ton. Number of handling was 28. The cargo handling is conducted continuously, and the productivity of tamarind was 18.18 ton/gang/hour. The average one cycle handling weight was 1.09 ton.

b) Brown Sugar

Cargo handling time was 6 hours and 6 minutes including working time of 5 hours 11 minutes and idle time of 55 minutes. Cargo volume handled was 37.25 ton. Number of handling was 55. The cargo handling productivity was 6.11 ton/gang/hour including idle time and 7.18 ton/gang/hour exclude idle time. The average one cycle handling weight was 0.68 ton. There was suspended time for waiting truck, break and shift change totaling 55 minutes.

(b) Ship gear no. 2

a) Natural Fertilizer

Cargo handling time was 7 hours and 29 minutes including working time of 4 hours and 40 minutes and idle time of 2 hours and 49 minutes. Cargo volume handled was 141.95 ton. Number of handling was 58. The productivity of cargo handling was 18.97 ton/gang/hour including idle time and 30.42 ton/gang/hour excluding idle time. The average one cycle handling weight was 2.45 ton. There were some interrupted time totaling 2 hours and 49 minutes. Interrupted time includes waiting for truck, shift change ad crane trouble.

2) Drum, Steel Pipe, Box, Crate, Roll and Steel Coil

The survey on productivity of drum, steel pipe, box, crate, roll and steel coil handling was conducted at the North Jamrud terminal, berth just in front of warehouse 106. The objective vessel was Amrta VII from Jakarta and unloads cargo onto wharf directly using ship gear (25-30 ton), 4 truck labors, 1 foreman and 4 ship labors. Total measurement time was 14 hours and 24 minutes including working time of 7 hours and 25 minutes and idle time of 6 hours and 59 minutes. The idle time includes shift change of 2 hours and 55 minutes, open deck works of 1 hour and 21 minutes and lunch break of 1 hour and 38 minutes. Total cargo volume handled was 391.469 excluding tyre in roll because weight is unknown. Total productivity of cargo handling was 27.19 ton/gang/hour. idle time for shift change etc. should be shortened for better productivity. The productivity of each cargo handling is described below.

(a) Drum

Total handling time was 5 minutes. Total handling volume was 0.4 ton. Number of handling was 2. The productivity of cargo handling was 4.89 ton/gang/hour. The average handling weight was 0.2 ton.

(b) Steel Pipe

Total handling time was 2 hours and 14 minutes including working time of 1 hour and 3 minutes and idle time of 1 hour and 11 minutes for opening of deck. Total handling volume was 44.83 ton. The productivity of cargo handling was 20.08 ton/gang/hour including idle time and 42.7 ton/gang/hour excluding idle time.

(c) Box cargo

Total handling time was 5 hours and 6 minutes including working time of 3 hours and 23 minutes and idle time of 1 hour and 43 minutes. Total handling volume was 154.533 ton. Total number of handling was 33. The productivity of box cargo handling was 30.3 ton/gang/hour including idle time and 45.68 ton/gear/hour excluding idle time. The average handling weight was 4.68 ton.

(d) Crate cargo

Total handling time was 3 hours and 49 minutes including working time of 47 minutes and idle time of 3 hours and 2 minutes. Total handling volume was 64.944 ton. Total number of handling was 22. The productivity of crate cargo handling was 17 ton/gang/hour and 82.91 ton/gang/hour excluding idle time. The average handling weight was 2.95 ton.

(e) Roll cargo

Total handling time was 32 minutes excluding tyre. Handling was conducted continuously. Total handling volume was 20.81 ton excluding tyre. Total number of handling was 8 excluding tyre. The productivity of roll cargo handling was 39.02 ton/gang/hour. The average handling weight was 2.6 ton.

(f) Steel Coil

Total handling time was 1 hour and 24 minutes. Handling was conducted continuously.

Total handling volume was 104.985 ton. Total number of handling was 25. The productivity of steel coil handling was 74.99 ton/gang/hour. The average handling weight was 4.2 ton.

Table 7.3.3.15 shows result of survey on cargo handling productivity at conventional terminal in the port of Tanjung Perak.

Table 7.3.3.15 Result of survey on cargo handling productivity

Type of Cargo	Commodity	Average Productivity Ton/Gang/Hour	Maximum Productivity Ton/Gang/Hour
Bag Cargo	Tamarind Brown Sugar Natural Fertilizer	18.18 6.11 18.97	18.18 7.18 30.42
Drum	Chemical Fluid	20.08	42.7
Pipe	Steel	20.08	42.7
Box	Electric Equipment & Steel Plate	30.3	45.68
Crate	Electric Equipment	17	82.91
Roll	Rubber & Tyre	39.02	39.02
Coil	Steel	74.99	74.99

In the survey, the study team found that ship gear (crane) was waiting for bag cargo and truck preparation, and shift change takes more than 2 hours. All these makes cargo handling productivity low. To avoid long idle time, cargo handling plan should be made considering not only capacity of ship gear but also transfer abilities on the wharf by trucks. And, terminal operator should have enough trucks for transfer cargo handled to sheds and warehouses.

7.3.4 Introduction of Automation and Computerization

In the field of document processing and information exchanging, the port of Tanjung Priok and Tanjung Perak have already employed computer systems.

Introduction of automation and computerization of cargo handling equipment is considered to improve cargo handling productivity and reduce operators of quay cranes, chassis head truck, transfer cranes. In the port of Tanjung Priok and Tanjung Perak, operations are supervised from control room through a CCTV network, a voice communications network, planning systems, hand-held terminals. Further introduction of automation and computerization are adopted in the port of Singapore. The PSA have introduced overhead traveling cranes, which are controlled remotely. Five overhead traveling cranes are operated by one operator simultaneously in order to reduce operators of the cranes and to fill lack of skilled operators.

Introduction of automation and computerization into the terminal operation should be planned carefully for achieving the best cost-performance referring to examples in advanced ports.

7.3.5 Accessibility to the Road Transportation

The container terminal in the port of Tanjung Perak is connected with Surabaya – Gresik toll road directly by dedicated ramps from the start of their operations. The conventional terminal is connected with Jl. Tanjung Perak by dual four lane city road. The Surabaya – Gresik toll road is being expanded to improve traffic congestion. The Jl. Tanjung Perak has traffic congestion due to narrow railway crossing at the JL. Jakarta.

The port of Tanjung Priok has traffic congestion near and around the port during peak traffic hours. In order to improve such congestion of roads around the port of Tanjung Priok, the IPC II has a concept of direct access ramps, which are planed to be built with private participation, from/to the container terminal. The concept of access ramps is prepared based on container O/D traffic survey conducted by IPC II and road traffic survey in the city of Jakarta done by the MOC.

A new container terminal will be constructed in the Lamong site located near the port of Tanjung Perak, and the access road connecting the terminal with the Surabaya – Gresik toll road are planned to be built with private sector participation in a similar way of Tanjung Priok.

At preparing master plan, access road plan is should be well coordinated not only regional land transportation plan but also regional land use plan.

The role of a port for hinterland is changing with growing and developing of related area, proper location of a new port facility should be selected considering the function of facility and accessibility to destinated area. In time of facility expansion, capacity of existing access road shall be evaluated considering increase of cargo traffic as well as related vehicle. And port development schedule and improvement of access road capacity conductd by another sector, should be well coordinated timely and budgetly. In case of large scale evelopment plan, the improvement of access road not only inside of port working area but also to appropriate arterial road should be included the program. For local port development, 2.75m dual land access road is suggested in proposed "Technical standard criteria for port facility in Indonesia". In local area, relation between port activity and regional activity is very deep, and city is, in general, expanding from the port. Location of new facility development shall be selected consideering modernization of land transportation such as Makasar and Pare-Pare.

(1) The field survey on the first destination of container

The study team conducted site survey to know the destination of container at the gate of the container terminal in the port of Tanjung Perak. Table 7.3.5.1 and Figure 7.3.5.1 show the result of the survey on the first destination of container observed at the gate of container terminal in the port of Tanjung Perak. The destination is divided into eleven regencies, they are Bali, Blitar, Gresik, Jombang, Malang, Mojokerto, Pasuruan, Sidoarjo, Surabaya, Tulungagung and others. The destinations are marked on Figure 7.3.5.3. Gresik has large warehouse areas and industries. Jombang has chicken farm area and sugar product industries. Malang has textile, fabric and garment industries. Mojokerto has pulp and paper industries. Pasuruan is an industrial area named PIER. Sidoarjo has electronic and leather industries. Surabaya is an industrial area named SIER and has electronic and plastic industries. The destinations are not far from the port of Tanjung Perak except Bali. The farthest destination is Tulungagung some 210km far from the port of Tanjung Perak.

Almost containers are transported to the first destinations at from 9:30 to 21:30 going out through the gate of the container terminal. Total number of containers was 427 TEUs by 255 trailers during the survey. Morokerto is the largest destination in number of containers transported. Number of container transported to Mojokerto has a peak at 15:30 – 16:30. Containers are transported every one minute at the peak time. This period is just before traffic congestion in city road by commuters. Accordingly, container transportation may be a cause of more traffic congestion on city road. Container should be transported at not peak time of traffic on city road.

(2) The field survey on road traffic

The study team also conducted site survey on road traffic to the Surabaya – Gresik toll road and the city road at the exit of the container terminal in the port of Tanjung Perak. Traffics from the exit of the container terminal are surveyed at the entrance of city road and toll road. Table 7.3.5.2-1 and Figure 7.3.5.2-1 shows the result of survey on traffic at the city road. Table 7.3.5.2-2 and Figure 7.3.5.2-2 shows tat at the toll road. In this survey, number of trailers is 989 units to the toll road and 2,000 units to the city road. It depends on the first destination of containers whether trailer's drivers take toll road or not. Traffic of trailers to the city road is two times larger than that for the toll road. Apparently, trailer's traffic to the toll road has a peak time at 15:00 – 16:00, and traffic to the city road has not obvious peak time. Trailer traffic to the city road does not concentrate avoiding traffic congestion on the city road.

Table 7.3.3.1 Utilization of facilities at Tg.Priok(conventional terminal) in 1997

Facility	Utilization	Unit	Value
Berth	BOR	%	71.00
	BTP	Ton/m	3,857.00
Storage	SOR	%	51.00
	STP	Ton/m2	16.00
Yard	YOR	%	38.00
	YTP	Ton/m2	16.00

Source: IPC II

Table 7.3.3.2 Service time of vessels at Tg.Priok(conventional terminals) in 1997

Service time	Hours
International vessel	
a. Turn round time	66.33
b. Waiting time	14.14
c. Berthing time	52.16
Domestic vessel	
a. Turn round time	73.48
b. Waiting time	15.12
c. Berthing time	58.36

Source: IPC II

Table 7.3.3.3 Productivity of cargo handling at Tg.Priok(conventional terminals) in 1997

Type of cargo	Unit	Value
Foreign vessel		
a. General	T/G/H	26.50
b. Bag	T/G/H	34.24
c. Liquid bulk	T/P/H	147.57
d. Dry bulk	T/G/H	418.51
Domestic		
a. General	T/G/H	24.38
b. Bag	T/G/H	33.97
c. Liquid bulk	T/P/H	106.27
d. Dry bulk	T/G/H	106.27
e. Container	TEU/C/H	9 B/C/H

Source: IPC II

Table 7.3.3.4 Utilization of facility at Tg.Perak(conventional termials) in 1997

Facility	Utilization	Unit	Value
Berth	BOR	%	74.00
	BTP	Ton/m	2,612.00
Storage	SOR	%	29.00
	STP	Ton/m2	13.00
Yard	YOR	%	25.00
	YTP	Ton/m2	8.00

Source: IPC III

Table 7.3.3.5 Service time for vessel Tg.Perak(conventional terminals) in 1997

Service time		Hours
International vessel		
	a. Turn round time	94.00
	b. Waiting time	6.00
	c. Berthing time	71.00
Domestic vessel		
	a. Turn round time	102.00
	b. Waiting time	8.00
	c. Berthing time	72.00

Source: IPC III

Table 7.3.3.6 Productivity of cargo handling at Tg.Perak(conventional terminals) in 1997

Type of cargo		Unit	Value
Foreign vessel			
	a. General	T/G/H	25.00
	b. Bag	T/G/H	22.00
	c. Liquid bulk	T/P/H	100.00
	d. Dry bulk	T/G/H	125.00
Domestic			
	a. General	T/G/H	21.00
	b. Bag	T/G/H	21.00
	c. Liquid bulk	T/P/H	59.00
	d. Dry bulk	T/G/H	65.00
	e. Container	BOX/C/H	12

Source: IPC III

Table 7.3.3.7 Utilization of facilities at Tg.Priok(container terminals) in 1997

Utilization		Unit	Value
Berth			
CT I	BOR	%	86.58
	BTP	Ton/m	910.08
CT II	BOR	%	74.14
	BTP	Ton/m	547.89
KOJA	BOR	%	59*
	BTP	Ton/m	253*
Yard			
CT I	YOR	%	66.10
	YTP	Ton/m2	55.00
CT II	YOR	%	5.51
	YTP	Ton/m2	65.75
KOJA	YOR	%	21*
	YTP	Ton/m2	130*

Source: IPC II
Note: KOJA data on December, 1997

Table 7.3.3.8 Service time for vessels at Tg.Priok(container terminals) in 1997

Service time		Hours
CT I and CT II		
	a. Turn round time	40.71
	b. Waiting time	1.06
	c. Berthing time	23.40
KOJA		
	a. Turn round time	20*
	b. Waiting time	0.37*
	c. Berthing time	18.77*

Source: IPC II
Note: KOJA data on December, 1997

Table 7.3.3.9 Productivity of container handling at Tg.Priok(container terminals) in 1997

Terminal	Unit	Value
CT I	B/C/H	18
CT II	B/C/H	17
KOJA	B/C/H	25*

Source: IPC II
Note: KOJA data is their minimum service target

Table 7.3.3.10 Utilization of facilities at Tg.Perak(container terminals) in 1998 (Jan.-Jul.)

Facility	Utilization	Unit	Value
Berth	BOR	%	69.92
	BTP	Ton/m	620.47
Storage	SOR	%	54.72
	STP	Ton/m2	25.48
Yard	YOR	%	68.73
	YTP	TEU/gls	71.41

Source: IPC III

Table 7.3.3.11 Service time for vessels at Tg.Perak(container terminals) in 1996

Service time		Hours
ICT I and ICT II		
	a. Turn round time	103*
	b. Waiting time	9*
	c. Berthing time	20.79*

Source: IPC III

Table 7.3.3.12 Productivity of container handling at Tg.Perak(container terminals) in 1998(Jan.-Jul.)

Terminal	Unit	Value
International container terminal	B/C/H	21.03

Source: IPC III

Table 7.3.3.13 Quay crane number CC3, Sumitomo RJ-46, Capacity 35.5Ton, 1983 built, 1984 installed

Time		Time		Unloading		Loading				Remarks
Start	Stop	Working	Idling	20'(Box)	40'(Box)	20'(Box)	40'(Box)	B/C/H	TEU/C/H	
7:40	8:15	0:35			16			27.42	54.86	Waiting for truck
8:19	8:20	0:01	0:04		1			60.00	120.00	Waiting for truck
8:25	11:00	2:35	0:05	64	27			34.84	45.68	Waiting for truck
11:04	11:35	0:31	0:04	20				38.71	38.71	Lunch break
11:45	14:00	2:15	0:10	66	6			32.00	34.67	Move crane position & wait for truck
14:05	14:35	0:30	0:05	21				42.00	42.00	Shift change
15:35	16:10	0:35	1:00	15				25.71	25.71	Move crane position & wait for truck
16:14	16:35	0:21	0:04	9				25.71	25.71	Waiting for truck
16:39	17:45	1:06	0:04			22		20.00	20.00	Waiting for truck & lunch break
17:58	19:00	1:02	0:13			19		18.39	18.39	Waiting for container
19:04	19:53	0:49	0:04			6	12	22.04	36.73	Waiting for container
19:53	20:00	0:07	0:00			1		8.57	8.57	At20:32, Deck instalation
20:02	20:30	0:28	0:02				12	25.71	51.43	At 20:52, Deck installation & wait for container
20:35	20:51	0:16	0:05				5	18.75	37.50	At 21:11, Deck installation & wait for containr
20:58	21:10	0:12	0:07				5	25.00	50.00	Wait for container
21:14	21:35	0:21	0:04				12	34.29	68.57	Wait for truck
21:45	22:35	0:50	0:10			22		26.40	26.40	Shift change
23:30	1:00	1:30	0:55			19	15	22.67	32.67	Operator went to toilet
1:05	1:10	0:05	0:05				2	24.00	48.00	Deck installation & moving the container
1:20	1:25	0:05	0:10				4	48.00	96.00	Move crane position
1:25	1:35	0:10	0:00				5	30.00	60.00	Move crane position & Deck installation
1:40	2:00	0:20	0:05				10	30.00	60.00	Finish
Total Box		14:44	3:36	195	50	89	82	22.69	29.89	416 Box, 548 TEUs
Total time										18:20
Productivity B/C/H										22.69 Box/C/H
Productivity TEU/C/H										29.89 TEUs/C/H

Table 7.3.3.14 Quay crane number CC4, Hyundai, Capacity 40 Ton, 1988 built, 1989 installed

Time		Time		Unloading		Loading				Remarks
Start	Stop	Working	Idling	20'(Box)	40'(Box)	20'(Box)	40'(Box)	B/C/H	TEU/C/H	
7:45	9:25	1:40			53			31.80	63.60	
9:30	10:27	0:57	0:05		39			41.05	82.11	Open deck
10:32	11:15	0:43	0:05	4	24			39.07	72.55	Open deck(1 container shifting at 10:50)
11:23	13:10	1:47	0:08	50	13			35.33	42.62	Open deck(2 of 40'container were shifting at 1:18
13:17	13:35	0:18	0:07		8			26.67	53.33	Cabling trouble
13:46	14:30	0:44	0:11	23	3			35.46	39.55	Changes of working shift
15:40	16:39	0:59	1:10			26		26.44	26.44	Waiting for container
16:45	16:58	0:13	0:06			7		32.31	32.31	Waiting for truck & deck installation
17:15	17:25	0:10	0:17			4		24.00	24.00	Waiting for container
17:37	18:25	0:48	0:12			1	24	31.25	61.25	Deck installation(2minits)
18:35	18:45	0:10	0:10				4	24.00	48.00	Wait for container
19:05	19:55	0:50	0:20			3	20	27.60	51.60	Wait for container
20:06	20:30	0:24	0:11	10				25.00	25.00	Wait for container
20:53	21:00	0:07	0:23			2	3	42.86	68.57	Finish
		9:50	3:25							
Total Box				87	140	43	51			321 Box, 512 TEUs
Total time										13:15
Productivity B/C/H										24.23 Box/C/H
Productivity TEU/C/H										38.64 TEUs/C/H

Figure 7.3.3.1 Container handling productivity (CC3)

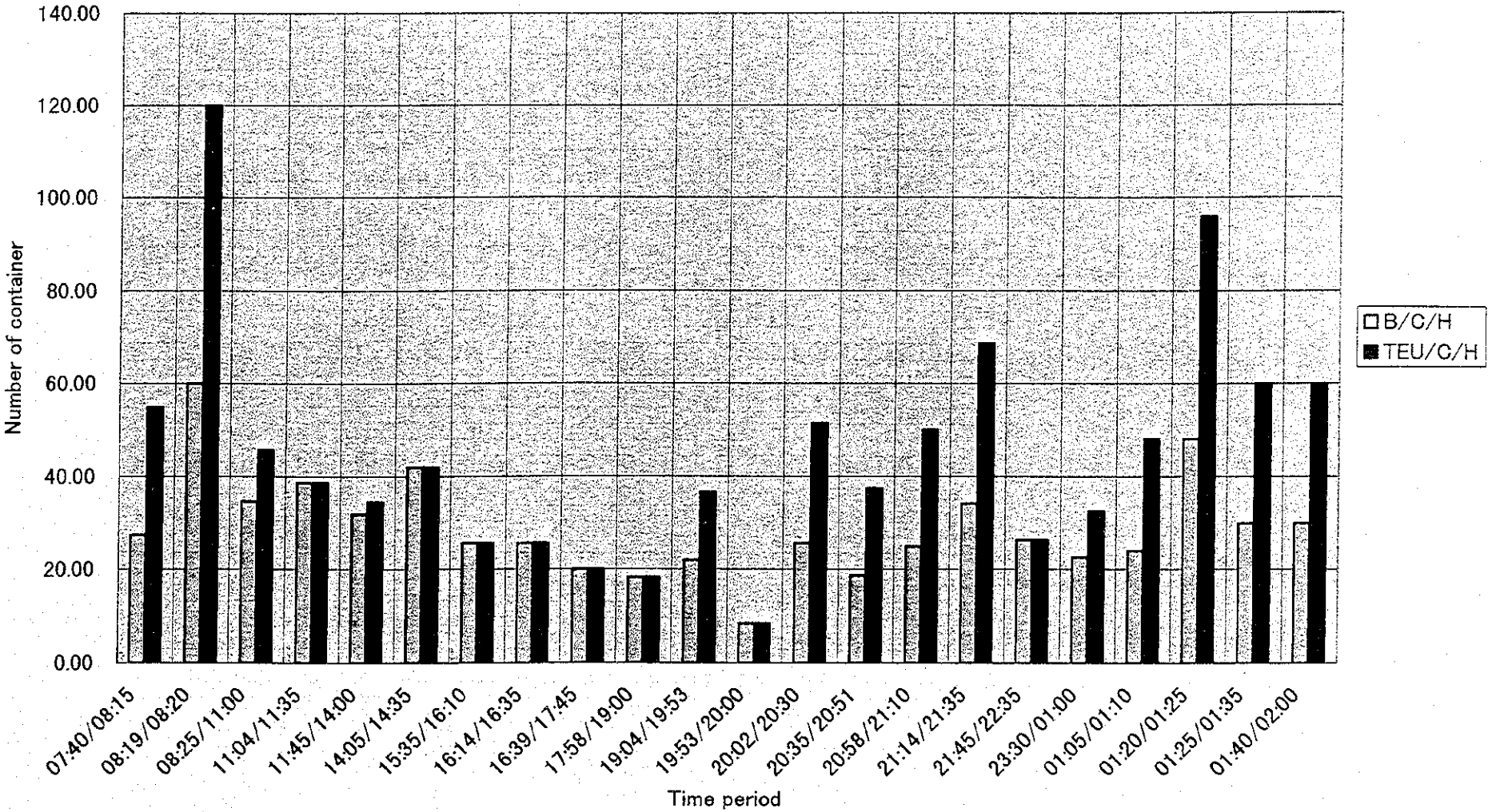


Figure 7.3.3.2 Container handling productivity (CC4)

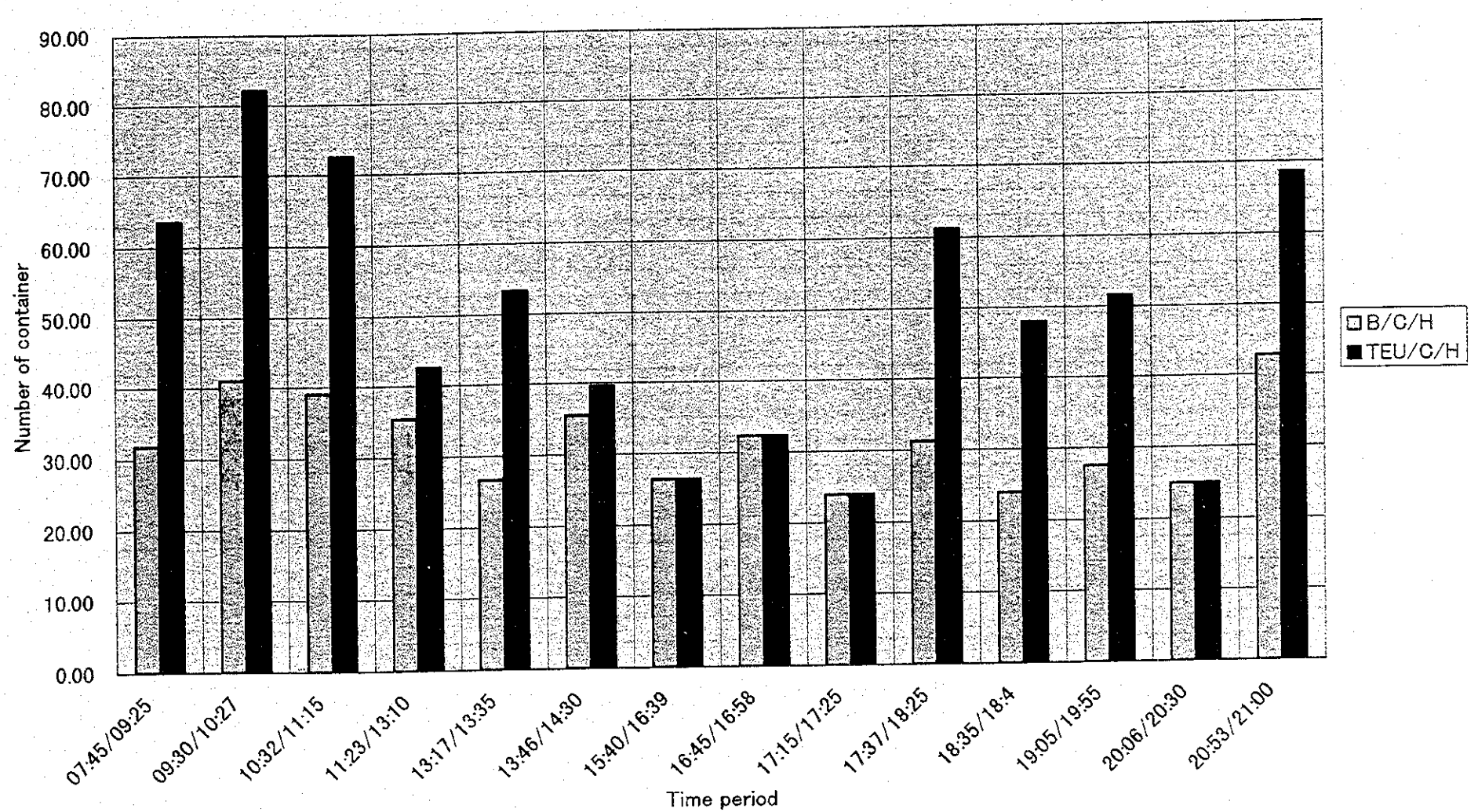
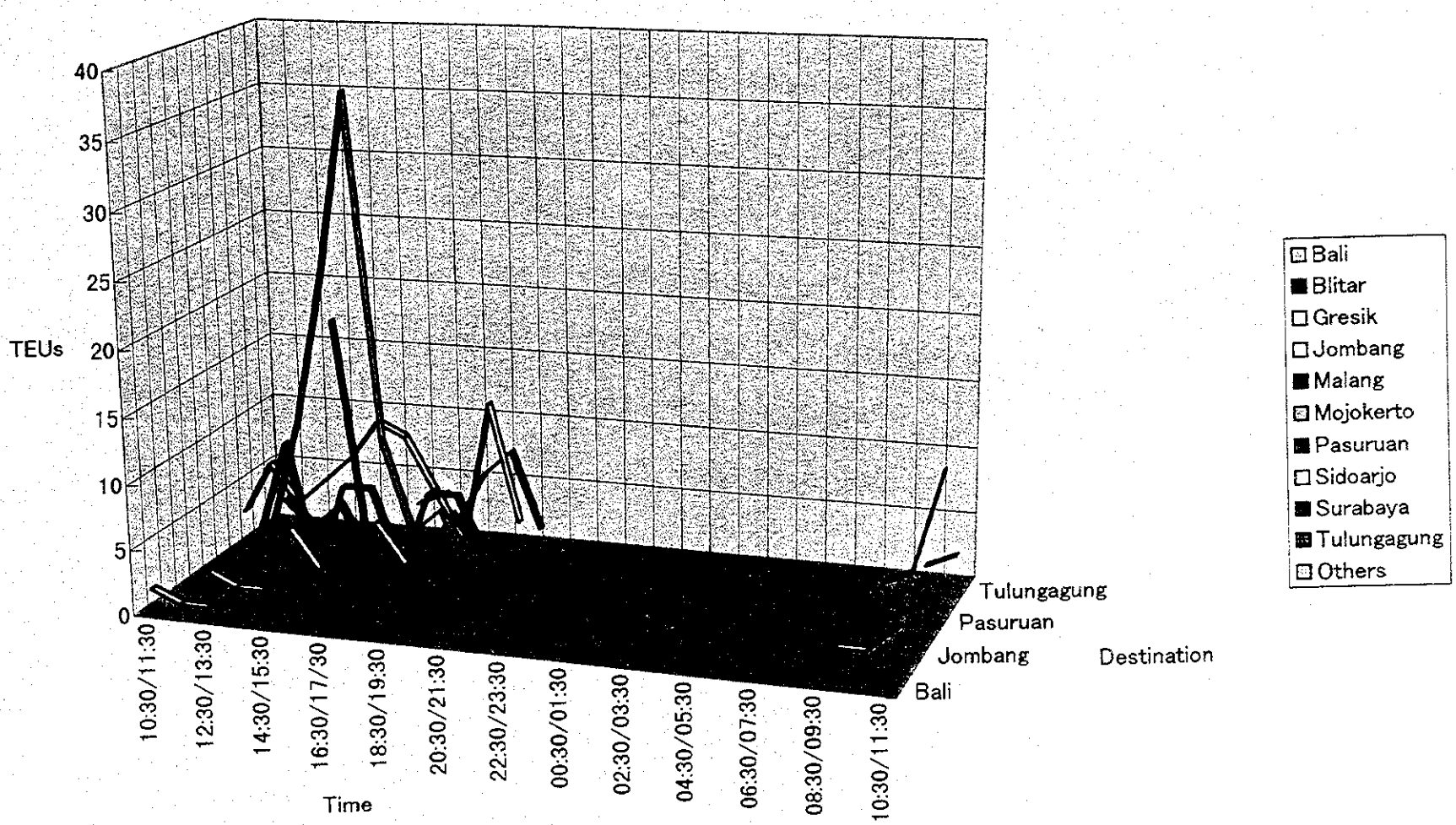


Table 7.3.5.1 The result of survey on the first destination of container

Destination	Bali	Blitar	Gresik	Jombang	Malang	Mojokerto	Pasuruan	Sidoarjo	Surabaya	Tulungagu	Others
Distance from the port		175 km	20 km	60 km	95 km	35 km	70 km	30 km	10 km	210 km	
10:30/11:30	2			2				3	15		
11:30/12:30	1		2					7			
12:30/13:30	1		1		4	4	5	4			
13:30/14:30		2	1	1	11	12	3	6	18		
14:30/15:30			6		1	23	5	8	1		
15:30/16:30			3	1	8	37	1	11			
16:30/17/30				4	8	11	3	10	4		3
17:30/1830			7		2	4	1	6	5	2	
18:30/19:30			4	2	8	6	5	2		6	
19:30/20:30				3	8	2	2	13		8	
20:30/21:30			3		3	3		4	5	2	
21:30/22:30											
22:30/23:30						4					2
23:30/00:30						4					
00:30/01:30											
01:30/02:30									2		
02:30/03:30											
03:30/04:30											
04:30/05:30											
05:30/06:30											
06:30/07:30											
07:30/08:30											
08:30/09:30			1		1		4	1	1		
09:30/10:30			1			1			2		1
10:30/11:30			3	1	4	2	10	1	10		2
Total	4	2	32	14	58	113	39	76	63	18	8

Figure 7.3.5.1 The first destination of container



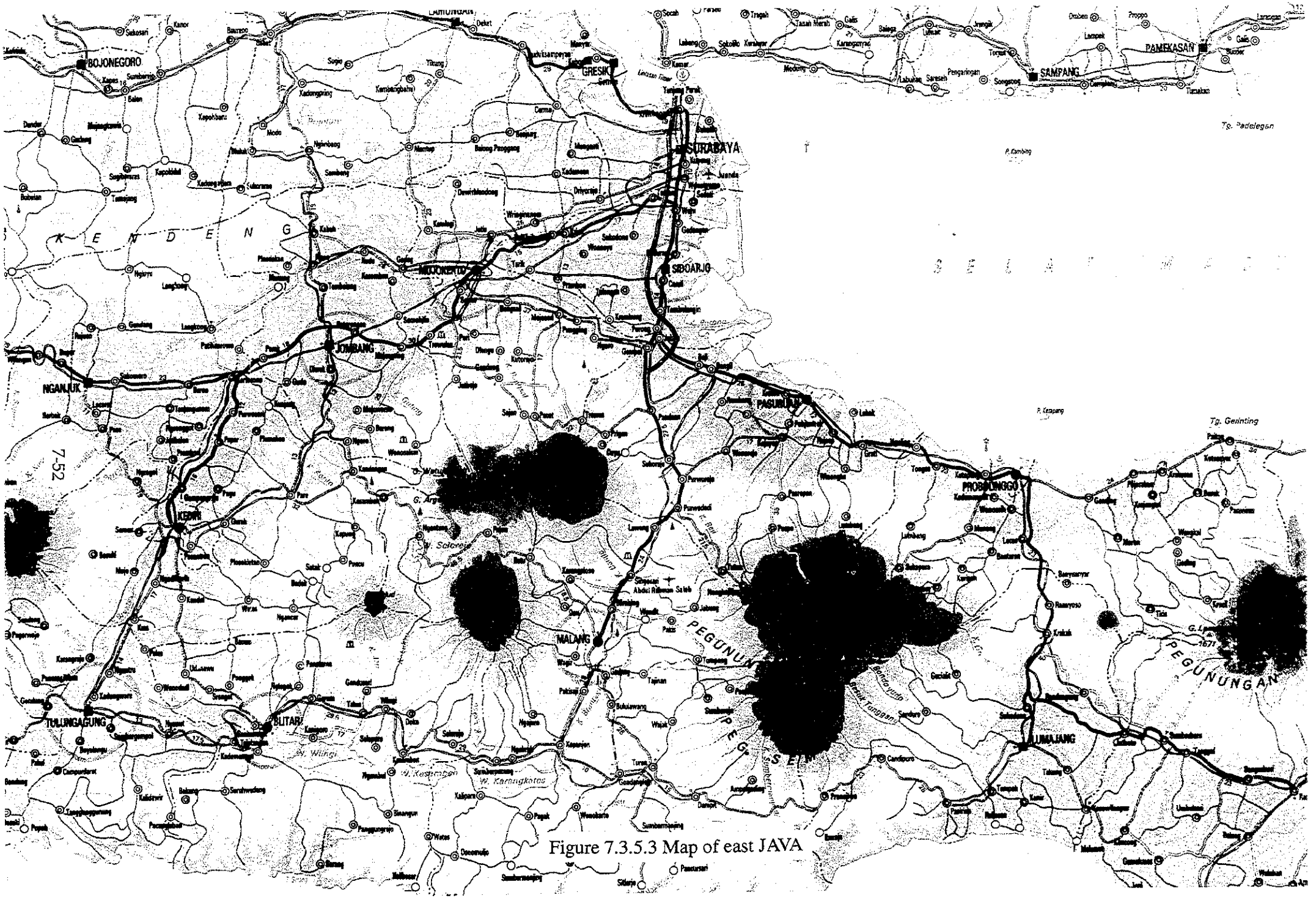


Figure 7.3.5.3 Map of east JAVA

Table 7.3.5.2-1 Survey on Road Traffic

Location	Jl. Tanjung Mutiara, access road from Container Terminal to city destination
Date	26 Aug. 1998
Period	10:45 to 10:45 at 27 Aug. 1998

No.	Time From/To	Vehicle				
		Car	Bus	Truck	Trailler	Equivalent car units
1.	10:45/11:45	85		28	117	
2.	11:45/12:45	70		22	41	
3.	12:45/13:45	57		28	114	
4.	13:45/14:45	60	1	34	191	
5.	14:45/15:45	79		27	196	
6.	15:45/16:45	84		24	146	
7.	16:45/17/45	74		11	153	
8.	17:45/18:45	42		10	67	
9.	18:45/19:45	15		6	114	
10.	19:45/20:45	22		4	147	
11.	20:45/21:45	16		2	75	
12.	21:45/22:45	5		2	56	
13.	22:45/23/45	15		2	66	
14.	23:45/00:45	7		1	28	
15.	24:45/01/45	1		1	39	
16.	01:45/02:45	6			33	
17.	02:/03:4545	2			16	
18.	03:45/04:45	4			4	
19.	04:45/05:5	6	1		10	
20.	05:45/06/45	15		1	21	
21.	06:45/07/45	35			14	
22.	07:45/08:45	70		10	77	
23.	08:45/09/45	63		14	130	
24.	09:45/10:45	60		15	145	
TOTAL		**893**	**2**	**242**	**2000**	

Figure 7.3.5.2-1 Traffic of City Road

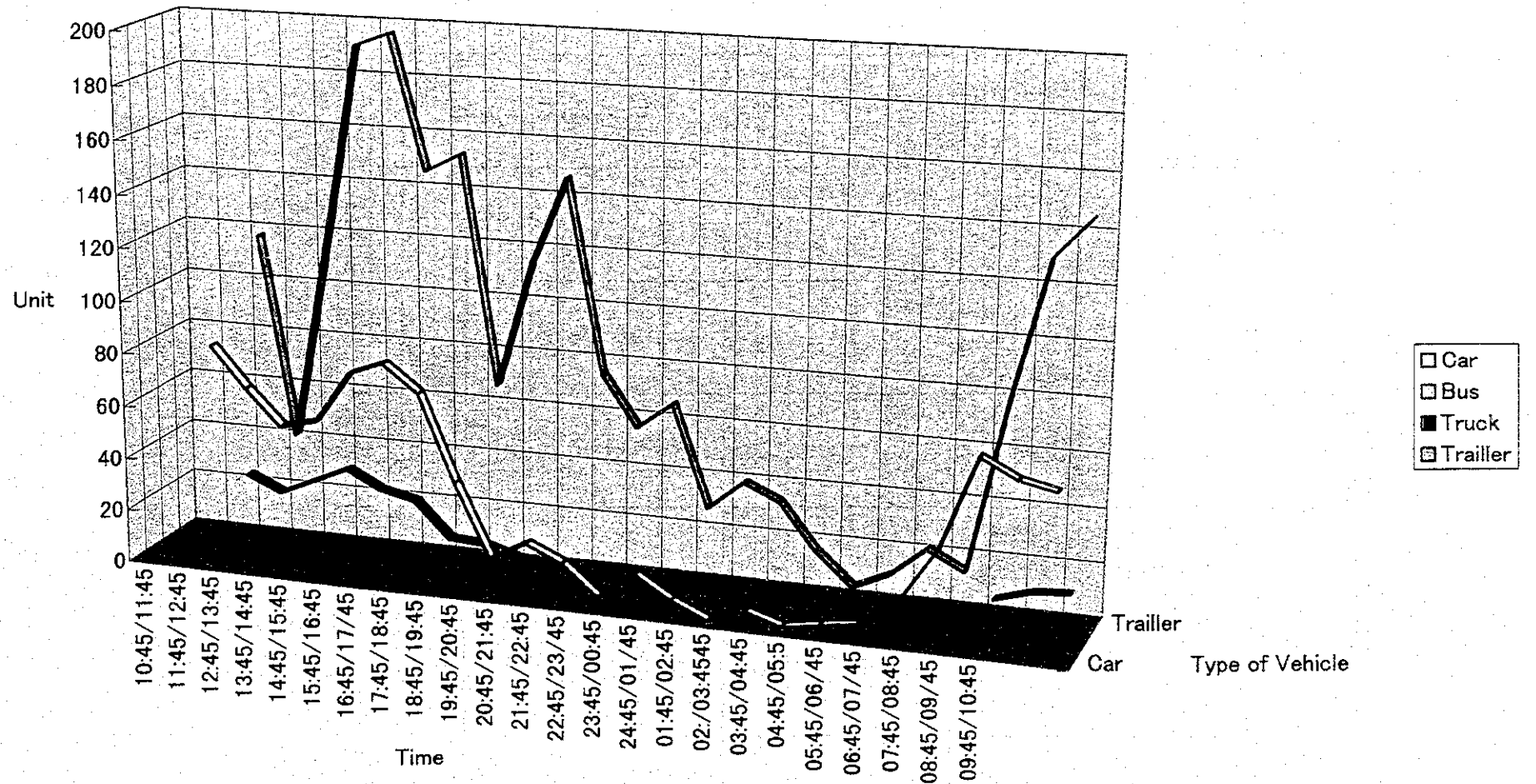
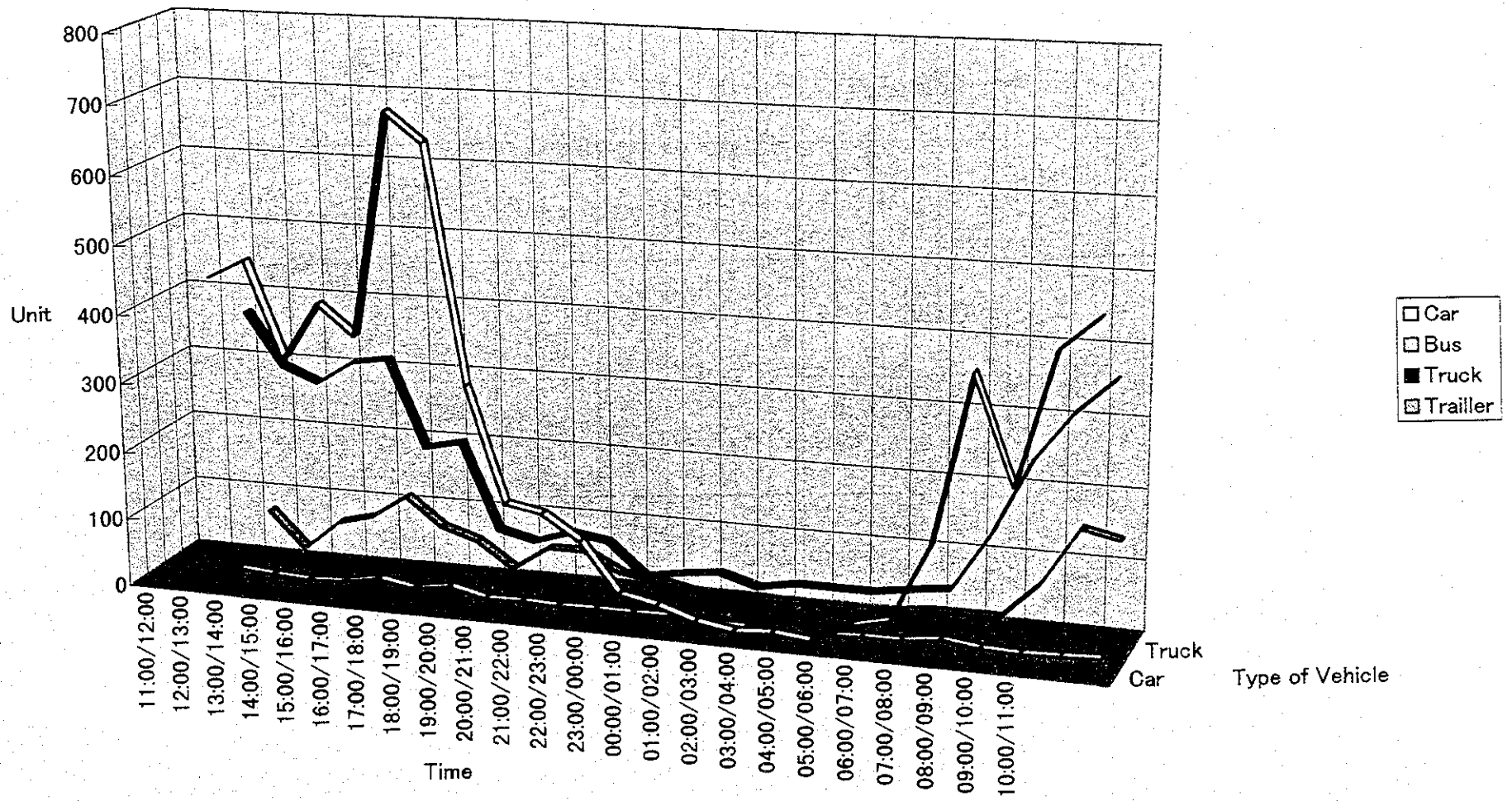


Table 7.3.5.2 -2 Survey on Road Traffic

Location	Access to Toll Road
Date	26 Aug. 1998
Period	11:00 to 11:00 at 27 Aug. 1998

	Time	Vehicle				
No.	From/To	Car	Bus	Truck	Trailler	Equivalent car units
1.	11:00/12:00	460	16	383	70	
2.	12:00/13:00	488	12	307	17	
3.	13:00/14:00	350	9	286	61	
4.	14:00/15:00	433	12	320	74	
5.	15:00/16:00	390	21	328	109	
6.	16:00/17:00	707	11	203	68	
7.	17:00/18:00	666	19	214	51	
8.	18:00/19:00	330	6	89	14	
9.	19:00/20:00	166	7	76	49	
10.	20:00/21:00	156	5	93	49	
11.	21:00/22:00	121	6	85	21	
12.	22:00/23:00	50	6	39	15	
13.	23:00/00:00	40	7	49	5	
14.	00:00/01:00	23	3	55		
15.	01:00/02:00	15	3	39	3	
16.	02:00/03:00	19		49	3	
17.	03:00/04:00	13	3	48	2	
18.	04:00/05:00	40	6	48	2	
19.	05:00/06:00	52	6	56	10	
20.	06:00/07:00	161	13	63	11	
21.	07:00/08:00	400	6	147	11	
22.	08:00/09:00	250	4	255	62	
23.	09:00/10:00	437	6	323	147	
24.	10:00/11:00	484	9	373	135	
TOTAL		**6251**	**196**	**3928**	**989**	

Figure 7.3.5.2-2 Traffic of Toll Road



7.4 Environmental Consideration in Port Development and Use

7.4.1 Environmental Impact Factors

The "Environmental Assessment Sourcebook (Word Bank Technical Paper Number 139)" refers as follows;

"Some of the most biological productive ecological zones in the word are coastal marine areas. They include beaches, sand dunes, estuaries, mangrove and other swamps, marshes and coral reefs. Estuaries, mangroves, marshes and other wetland areas provide the breeding grounds, nurseries and habitats for many major commercial species of shellfish and finfish consumed worldwide. Coastal marine ecological areas are fragile because the complex food chains and life cycles of all species are easily damaged when a few are affected by environmental changes. Thus, dumping urban and industrial wastes or runoff of agricultural chemicals may damage a relatively small area, but the impacts may ricochet throughout the rest of the ecosystem."

Generally, the port activities are closely related to the industrial development and other projects in hinterland. It brings impacts and effects on wide area combining with economic growth and urban activities.

Port activities impact on environment in various ways through the implementation of construction, closing water area by breakwater, navigation of vessels, cargo handling at wharves and so on. Then, various activities closely related to the port are also shown in the areas behind the port, for instance, production activities of industries using advantageous location, activation of traffic occurred from port and so forth. Furthermore, in the surrounding urban areas of port, mostly, the population increases with the growth of economic activities, and various pollution issues or impacts on natural environment tend to get serious.

It is difficult to grasp the future environmental aspects from the impact of port development alone. For example, in case of estimating future water quality in the port, in addition to the impacts from port construction and facilities, discharge from industrial estates and living life in hinterland must be taken into consideration.

Table 7.4.1 shows the relation between environmental impact factors and components in the port development and related activities.

Table 7.4.1 Relationship between Environmental Impact Factors and Components on the Port

Components / Impact Factors	Air Quality	Water & Bottom Condition	Noise & Vibration	Odor	Topo-graphy	Coastal Hydrology	Fauna & Flora	Scenic View	Waste	Socio-culture	Socio-economy
Contruction Work	○	○	○	○	○		○		○	○	○
Existing of Port		○			○	○	○	○		○	○
Use of Water Area Facilities	○	○			○		○		○		○
Use of land area Fcilities	○	○	○	○			○		○		○
Operation of Hazardous Handling Facilities	○	○		○			○				○
Treatment and Disposal of Waste	○	○		○			○		○	○	
Traffic Functions	○		○				○			○	○
Industrial Production Activities	○	○	○	○	○		○		○	○	○
Operation of Distribution and Storage Functions	○		○	○							○
Use of Recreational Facilities		○					○		○	○	○