Part 3 SELECTION OF THE PRIORITY PORTS

5. PRELIMINARY STUDY ON THE SOCIO-ECONOMIC FRAMEWORK

Chapter 2 describes recent events in Indonesia. Given the high level of political and economic uncertainty and global problems, forecasting the future macro situation is obviously open to some difficulty.

Nevertheless, Indonesia is resource rich and World Bank and ADB indicate a bright future if progress in reforms and restructuring can be made, and the political situation remains calm with the first democratic government providing a sound framework for development.

It is also expected that decentralisation will settle down and some of the initial problems being experienced will be resolved soon.

In these circumstances, real national GDP growth could return to 5-6 percent in the next few years. It is estimated by ADB for example that GDP growth in 2002 could reach 4 or 5 percent. Provincial GDP is likely to grow faster than national GDP based on previous experience in Indonesia before the economic crisis.

In addition, exports are recovering in the resource sector which will particularly affect the study ports.

The national and provincial economic outlook, while currently less than optimum is likely to improve with a favourable impact on the traffic through the study ports.

6. DEVELOPMENT ENVIRONMENT FOR THE PRINCIPAL RIVER PORTS

6.1 Interaction between the Port and Region

Infrastructure development has promoted local economic growth, led to the improvement of living conditions in cities and helped decrease regional economic disparities. Generally speaking, transportation infrastructure development contributes to economic development by providing a region with smoother, safer, more reliable and cheaper transportation means. In particular, for industries handling bulky raw materials and products such as coal, oil, wood products and so on, transportation by vessels is considered essential from the view point of saving costs and energy.

As infrastructure has a long life span and continues to impact inhabitants and industries in the region, it is important to decide the most appropriate time, location and kind of infrastructure to develop in the region considering its effect on regional economy and the welfare of inhabitants.

6.2 Outlook of the Regional Development

Prospective industries of the target provinces are mainly those based on their rich natural resources. Consequently, there is not a great difference among the provinces. River ports in the region, if properly developed, will contribute to realize the economic potential of the area.

Table 6.2.1 Prospective Industries of the Target Provinces

Province	River Ports	Prospective Industries
Riau	Pekanbaru	Perm oil plantation, CPO production and processing, Pulp and paper production, Coal mining
Jambi	Jambi	Perm oil plantation, CPO production and processing, Oil refinery, Petrochemical industry, Coal mining
South Sumatra	Palembang	Perm oil plantation, CPO production and processing, Coal mining
West Kalimantan	Pontianak	Wood processing, Perm oil plantation, CPO production and processing, Coal mining
Central Kalimantan	Kumai/Sampit	Wood processing, Perm oil plantation, CPO production and processing
East Kalimantan	Samarinda	Wood processing, Perm oil plantation, CPO production and processing, Coal mining, Industrial estate

6.3 Evolution of the Transportation Network

In Sumatra, the Trans Sumatra Highway is the main road, providing a north-south link between the major cities located inland. The east-west road link is not well established, though.

Only South Sumatra has railway in the tree provinces of the target ports. The railway connects

Lampung, Baturaja, Perabumulih, Palembang, Muara Enim, and Lahat. This railway is used to carry minerals like coal as well as passengers.

An access road between Palembang and Tanjung Api-api is under construction. A part of the road has already been developed with a provisional section. Out of the entire span, only a 15 km section is paved and about half of the pavement is already badly damaged.

The road network is very poor in Kalimantan, because a large part of the area is either swampy or mountainous. The road density is much less than the national average.

Although the main road of Kalimantan, Trans Kalimantan Highway is planned to connect main cities with each other, so far neither the road to connect West Kalimantan with Central Kalimantan nor the road network inside each province has been completed yet. Although a road from Pontianak to Sanggau and Sintang was built, the road condition is not good.

7. PRELIMINARY DEMAND FORECAST

This forecast was made on a preliminary basis for all seven ports. The initial methodology was based on analysing general cargo and container traffic as well as specific bulk commodities since 1988 (the earliest year that consistent data could be obtained).

Forecasts were made of total (public and private) traffic and container and general cargo traffic at the public port facilities for 2007 and 2025. Forecasts were also made by main commodity.

Based on the research, it is clear that there is unmet demand for public facilities, and assuming port development proceeded in each location, some portion of general cargo will transfer from private to public wharves.

In general, the short-term growth rates averaged 6 % for total cargo, 7 % for public cargo and 13 % for container growth. Long-term rates averaged nearly 5 % for total cargo, 6 % for public cargo and 8 % for container growth.

Due to the nature of the cargo handled, long-term container rates are constrained by lack of general cargo to containerise, although the commodity based forecasts indicate that the containerisation projection will be about 80 % of theoretical maximum by 2025.

8. PRELIMINARY EVALUATION OF RIVER ACCESS CHANNELS

8.1 Sedimentation in River Channels

The phenomenon of sedimentation by which fine materials of clay and/or silt are agitated, drifted and deposited in the estuary and river channels is called "siltation". It is characteristic of the siltation process that flocculation of fine materials of clay and silt occurs in the estuary by mixing of river water and seawater.

Fine materials of clay and silt suspended in river water are negatively charged at their surface, and the flocculation does not occur because of the electrical repulsion among the grains. Thus the sedimentation of the fine materials is rather slow in river flow.

But once the suspended fine materials contact with seawater, the negative charge on the surface is neutralized with the positive ions of Na^+, K^+, Mg^{++}, etc. and the suspended materials change easy to flocculate. The flocks formed by the process will deposit in the estuary area and a layer of fluid mud will be formed at the bottom.

(1) Pekanbaru

Maintenance dredging of the channel is not a serious problem at Pekanbaru. Sediment discharge is estimated using the average yearly river flow and observed suspended solid (SS) at about 1,000,000 m^3/year. The sediment at the river mouth is probably being washed away and entrained by the tidal current in the narrow strait without causing sedimentation. The river channel of Siak River has sufficient depth of LWS -15 - 20 m, except for the parts of the confluence to Selat Bengkalis and Pekanbaru area.

(2) Jambi

A large sandbar (Outer Bar) with a width of over ten kilometers alongshore and 7 – 10 km on-offshore is located in the estuary area of Batanghari River. The navigation channel to Port of Jambi cuts through the sandbar and is maintained by dredging. The average yearly volume of the dredging in the navigation channel of Port of Jambi is given as about 350,000 m^3. The channel division from Muara Sabak to Tanjung Solok is the portion where the river bed is dynamically maintained by the flushing effect of the river flow, and the water depth maintained by the river flow is LWS -5 to -7 m.

(3) Palembang

The maintenance dredging volume in the navigation channel of Musi River reaches 2,300,000 m^3 on average every year. According to the survey records, most part of the sedimentation volume intensively takes place at the 30 km division of the downstream channel and Outer Bar. The sedimentation volume at the channel divisions on Outer Bar accounts for 70 % of the total volume in the four-year average.

The sedimentation volume at the divisions along the inner river channel has rather a smaller ratio to the total volume compared with the river mouth area. The shares of sedimentation volume at Muara Selat Jaran and /or Sungai Lais reach 5 – 7 % and are considered not negligible. One of the dumping areas of dredged sand is located in the neighboring upstream of Muara Selat Jaran, and it is reported that the dredged sediment disposed of at the dumping area in the river channel is transported downstream and is causing sedimentation again. Thus dredging work involves duplication of effort in this area.

(4) Pontianak

The Outer Bar and the shallow water area spreads about 10 km from the river mouth in the estuary of Kapuas Kecil River. A navigation channel of 15 km length runs through the Outer Bar and is maintained by dredging. The average yearly volume of the dredging in the navigation channel of Port of Pontianak is about 1,300,000 m^3. The depth of sedimentation in the channel is estimated as 0.5 – 0.6 m from the bottom of the design section; it is understood that sand and/or consolidated silt is deposited.

(5) Kumai

A shallow water area (LWS-0.5 – 5 m) with the width of 10 km spreads inside and outside of Teluk Kumai (Kumai Bay). A navigation channel of 18.5 km length runs through the shallow water and is maintained by dredging. The average yearly volume of the dredging in the navigation channel of Port of Kumai is about 440,000 m^3. The depth of sedimentation in the channel is estimated as about 1 m from the bottom of the design section; it is understood that sand and/or consolidated silt is deposited.

(6) Sampit

In Sampit Bay, the water depth at the bay mouth reaches 10 – 15 m. A navigation channel with the extension of about 10 km runs through the shallow water area and is maintained by dredging. The average yearly volume of the dredging in the navigation channel of Port of Sampit is about 720,000 m^3. 70 % of total sedimentation volume was caused in the 7 km division in the shallow water area in the bay head. The depth of sedimentation in the channel is estimated as 1.5 m from the bottom of the design section; it is understood that sand and/or consolidated silt is deposited.

(7) Samarinda

A very large-scale delta is formed at the river mouth of Mahakam River. The main navigation channel to Samarinda has a 65 km extension from the south entrance of the delta, where a 29 km portion of the navigation channel is maintained by dredging. The average yearly volume of the dredging in the navigation channel of Port of Samarinda is about 1,450,000 m^3. 80 % of total dredging volume is taking place in the navigation channel in the Outer Bar area.

8.2 Channel Management and Maintenance Dredging

(1) Pekanbaru (Siak River)

Frequent ship collision accidents are reported in Siak River and so the navigation in nighttime is restricted. The installation and maintenance of navigation aids and signs are a main issue in Siak River in order to secure the safety of the navigation channel.

(2) Jambi (Batanghari River)

Port of Talang Duku is located at 155 km upstream from the river mouth and the navigable vessel size to the port is restricted to L_{OA} <75 m and Draught <5.0 m. The seasonal fluctuation of the water level is big in Sungai Batanghari (5 – 7 m) between rainy season and dry season. Muara Sabak, which has a development plan designed by the provincial government, is located at 25 km from the river mouth. There is no sharp bending in the river channel up to there. The navigable vessel size is L_{OA} <115 m and draught <6.5 m, or a little larger as compared with Talang Duku.

The major portion of the siltation is concentrated within the division of 11 km from Outer Bar. However, the record of sounding survey of the channel is limited to this division and it is also understood that sufficient channel management has not been carried out.

In case a pair of training dykes is constructed at the river mouth as a countermeasure of siltation, the water depth maintained by the effect of the dyke would be LWS-5 to -7 m at the most.

(3) Palembang (Musi River)

According to the sounding records, 90 % of the volume of sedimentation on the navigation channel is concentrated within the 30 km division in the downstream most part of the river channel. The depth of the channel in this division is shallow water less than LWS -5 – 6 m and it is maintained by infrequent dredging. The water depth of LWS -7 to -10 m is generally secured in the upper stream divisions

The two locations of Pulau Kramat and Muara Selat Jaran show water depth the same as in the riverbed profile, and the dumping areas of dredged soil are set up at these points. Although the formation of the new sandbar in the river channel has been reported at Muara Selat Jaran, actually no sounding survey of the channel has been carried out in the vicinity of the dumping area.

The dumping area along the river channel should be established onshore of the riverbank or the sandbar and not in the water area. In order to improve the method of dredging and disposal of the dredged material, a cutter suction dredger should be introduced instead of the suction hopper dredger (currently used) with the pumps, delivery pipes from the pumps to a dumping area.

(4) Pontianak (Kapuas Kecil River)

The navigation channel extending toward the river mouth runs through Outer Bar of the river and the depth of LWS -5 m is maintained by infrequent dredging. On the other hand, the channel division from Port of Pontianak to Pulau Panjang shows the depth of LWS-8 to -10 m, and yearly maintenance dredging is not carried out here.

The sounding survey of the navigation channel to plan the dredging program is limited only to the 15 km division from Outer Bar to Jungkat, and no information is available of the changes of the inner channels riverbed. The sounding survey should be conducted regularly for the purpose of proper management and maintenance of the river channel.

The yearly average volume of the maintenance dredging in the navigation channel is 1,300,000 m^3/year in the Port of Pontianak, while the volume of sedimentation from the records of pre-dredge sounding was calculated as 700,000 to 800,000m^3/year. To examine the inconsistency between the sources and to optimize the dredging program, sounding survey should be performed to distinguish the fluid mud layer and the consolidated silt layer in the river channel.

(5) Kumai and Sampit

Kumai River and Mentaya River on which Port of Sampit is located have rather deeper river channels among the Kalimantan rivers and show a water depth of LWS -8 to –10 m excluding the estuary area. Between two rivers, average sedimentation of 500 – 700 x 10^3 m^3/year takes place in the navigation channel at the estuary area.

In order to continue to use the river ports and river channel, maintenance dredging is unavoidable in the channel of the estuary area. The optimization of the volume and work method of the maintenance dredging will be a main issue of the channel management in the future.

It is projected that CPO, general cargoes and container cargoes will be handled mainly in the river ports along Sungai Mentaya and Sungai Sampit. Hence, the introduction and utilization of the shallow draught vessel for the re-vitalization of the river transportation will be useful.

(6) Samarinda (Mahakam River)

A vast delta is formed at the estuary of Sungai Mahakam, and the division of the navigation channel which runs through the delta stretches 35 km. The river channel upstream from Tanjung Sanga-sanga has deep water over LWS -10 m.

Here the stream diverges from the trunk river to many branches, and the river flow rate and flow speed drop off in the delta. The channel division downstream of Tanjung Sanga-sanga becomes shallower to LWS -5 - 8 m, and the water depth of the navigation channel is maintained by dredging.

To cope with the growing traffic volume in the navigation channels to Samarinda, the countermeasure to increase the depth and/or the width of the navigation channel is not recommended because that will only cause an increase in the volume of maintenance dredging. It is necessary to examine the possibility of the development of the deep seaport.

8.3 Appropriate Dimensions of Vessels

(1) Characteristics of Each Port from Calling Vessel

Information on the annual total number of vessel calls and their total GRT (gross register tonnage) for each study port and for each service were collected from IPCs. The average vessel size of calling vessel (GRT) for each study port was calculated as follows:

Average size (GRT) of calling vessels of each port (1999)

		Pekan-baru	Jambi	Palem-bang	Ponti-anak	Kumai	Sampit	Sama-rinda
International	10^3 GRT	7,634	3,318	2,456	5,348	1,250	262	9,805
	Ship Calls	1,658	1,463	865	953	114	69	816
	Average GRT	4,605	2,268	2,839	5,612	10,965	3,803	12,016
Domestic	10^3 GRT	8,494	2,061	7,482	4,424	2,665	2,957	8,338
	Ship Calls	5,494	3,582	2,887	5,137	2,658	4,638	11,997
	Average GRT	1,546	575	2,592	861	1,003	637	695

The main observations from this table are as follows:

1) Vessel size of international service is greater than domestic service, but in the case of Palembang, nearly the same size vessels are used in the international and domestic services.
2) In international service, larger vessels (over 10,000 GRT) have been calling at Samarinda and Kumai ports compared with other study ports. In Samarinda, large vessels for international service load/unload their cargo at an anchor point offshore.

(2) Shallow Draught Vessel

In the design of shallow draft vessels, draft (d) and length have restrictions for engineering and hydraulic conditions. Therefore, in order to increase the "carrying capacity" of the vessel, the breadth of the vessel (B) is usually increased (considering restrictions of the width of the channel, etc.) to the technically maximum possible extent. The ratio B/d is one of the important indexes of shallow draft vessels.

PERTAMINA product tankers gain large DWT from shallow draft vessel design. In Musi type vessels, the large capacity gain is not so clear because large space is occupied for urea unloading facilities and equipment (bucket elevator, shuttle boom conveyor, etc.).

There are two representative types of cargo vessel designs, "volume design vessel" and “weight design vessel”. If these designs are applied to shallow draft vessels, the following observations are made. Under fully loaded condition, two restrictions (volume and weight listed below) are very difficult to satisfy simultaneously.

1) Shallow draft vessel having large cargo holds / tank capacity,
2) Shallow draft vessel having large DWT

Requirements to be applied in the design of shallow draft vessel are summarized as follows.

1) Enlarge cargo hold; and partial loading or topping should be limited. “Topping” here is additional loading of cargo that is transported by barge near the river mouth and is loaded to mother vessel.
2) Shallow draft type vessel may be applicable to tanker or bulk carrier.
3) Shallow draft type vessel do not seem to be applicable to general cargo vessels. General cargo vessels are suitable for carrying wide range of cargo, on the other hand, shallow draft vessel must be designed for specified cargo loading.
4) In general, Sumatra river ports are located farther from the river mouth than those of Kalimantan and Sumatra rivers have more bends or sharp curvature than those of Kalimantan.
5) In a shallow draft vessel, the hull must be designed with very careful consideration for stream-lining along the hull surface to avoid vibration, noise and low maneuverability, etc.

Musi type vessels and Pertamina product tankers satisfy the above mentioned shallow draft vessel requirements.

9. PORT MANAGEMENT SYSTEM

9.1 Identification of Problem Areas

(1) Port Working Area and Port Interest Area

- I PC manages the land and water area of the ports as a Port Authority, and ADPEL of the MOC is responsible for the navigational safety in the port, channel, and sea area.
- In some cases, a long time has passed since port working area and port interest area were established. They need to be reviewed to respond to the current needs.

(2) Utilization and Management

- Generally, land area is narrow in river ports. These river ports traditionally handled daily goods in the break-bulk form but the ports are now required to handle containers and thus a wider space is needed.
- In the land area, there are a lot of port-related offices aggravating the congestion. These buildings need to be relocated.
- Some ports do not have a good access road.

(3) Administrative Services

- In order to improve the port administrative services, it is necessary to expedite and simplify the procedures needed to get various permissions.
- Therefore it is necessary to simplify the formats or to introduce an EDI system and manual system.

Figure 9.1.1 shows Port EDI System (Internet).

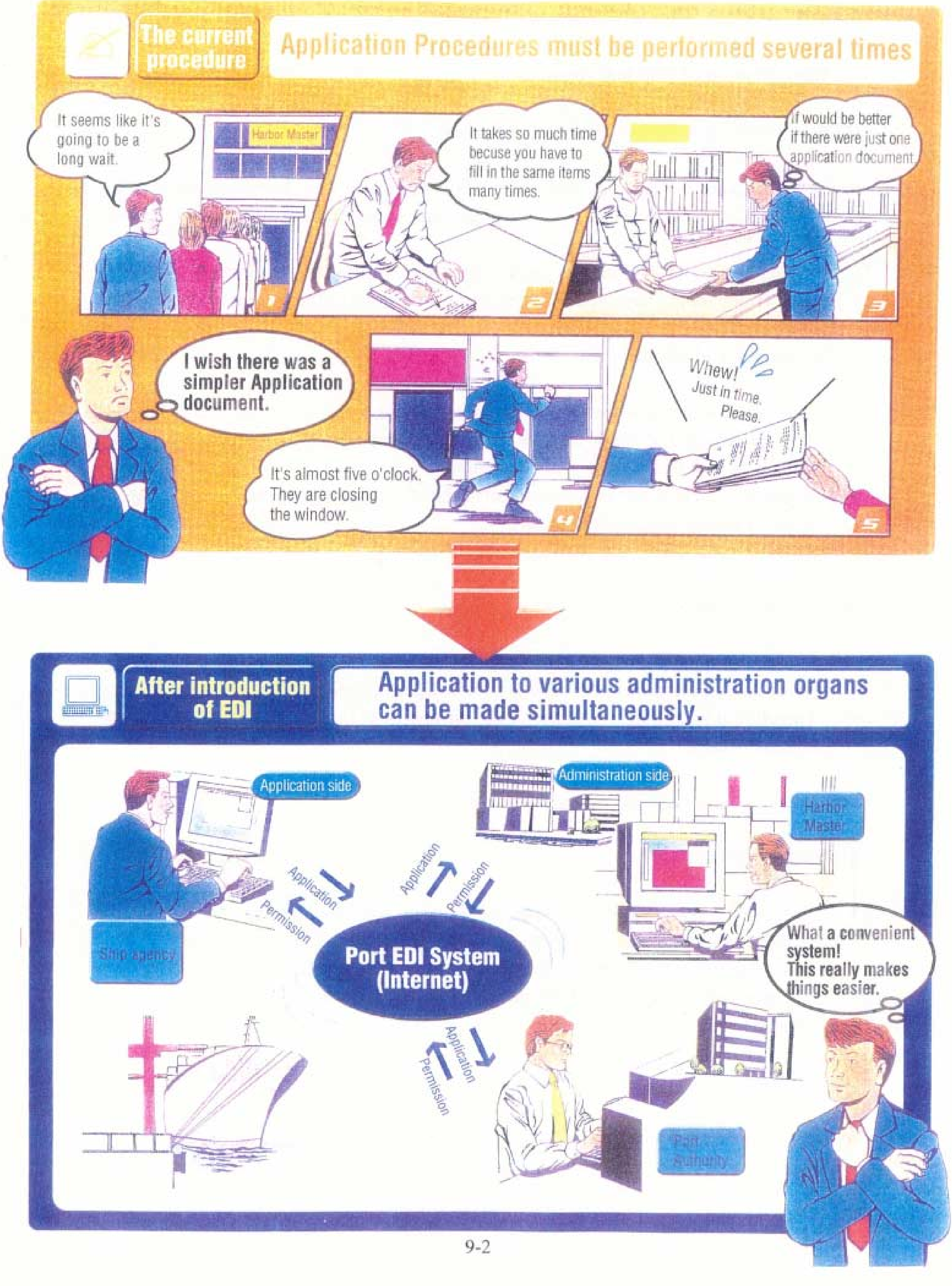
(4) Navigational Safety

- River ports are located far from the estuary, and maintaining safe navigation throughout the channel is a serious issue. Therefore, MOC has taken measures, such as a compulsory pilot system (for vessels over 105 G T in Jambi and over 150 G T in Pekambaru). Still, navigation rules in Indonesia are not as comprehensive as in other countries.

(5) Budgets

- Maintenance dredging in Palembang and Samarinda has been fully funded by the

Figure 9.1.1 Port EDI System



central government until recently. Due to the country's financial difficulty, IPC started to shoulder a part of the dredging costs in Samarinda ports in 2001. It is necessary to determine who is responsible for the dredging expenses: central government, local government (province/municipality), or the private sector (company/user of the port).

(6) Staff Training

- After port administration is decentralized, it will become important to develop port experts at the local level.

9.2 Port Management and Port Privatization

(1) Outline

Indonesia is no exception to the trend of privatization. It is becoming more and more common to introduce foreign capital and privatize government enterprises, arming to increase efficiency. Electric power, road construction, railway, communication, and port construction/management are suitable for management by the private sector.

As for the port management, four Indonesia Port Corporations (PT. PELINDO or IPC I, II, III and IV) were established in 1992. IPC manages all the major ports in Indonesia. However, some terminals are privatized. IPC II and Hutchison jointly operate and manage some of the container berths in the Tanjung Priok port. In IPC III, the extension of the container terminal at Tanjung Perak (Port Surabaya) was undertaken by a JV comprising IPC III and P & O. It is expected that privatization will continue in the transportation sector.

(2) Port Management in Indonesia after Decentralization

MOC is following the government's decentralization policy and decided to transfer some of its authority in the port sector to local governments. There are many timber companies and port related industries along major rivers and they have their own port facilities. It is necessary to examine the possibility of the consolidation of private facilities to realize the economies of scale. As the port cargo increases in the future, privatization of the cargo handling service will need careful consideration.

10. PRELIMINARY DEVELOPMENT SCENARIO OF THE PRINCIPAL RIVER PORTS

10.1 Present Capacity

10.1.1 Target Productivity

The Study Team prepared a set of baseline productivity figures based on the average productivity of major Indonesian ports (Table 10.1.1). The baseline productivity assumed a slight improvement in the operational efficiency.

Table 10.1.1 Baseline Productivity

Cargo type	Productivity
General Cargo	20 (t/gang/hour)
Bagged Cargo	25 (t/gang/hour)
Unitized Cargo	30 (t/gang/hour)
Liquid Bulk	120 (t/hour)
Dry Bulk	90 (t/hour)
Container (Container Terminal)	20 (TEU/crane/hour)
Container (Conventional Terminal)	10 (TEU/crane/hour)

Another key aspect in evaluating the port operation is berth occupancy ratio. The Study Team took into account the maximum berth occupancy proposed by UNCTAD (Table 10.1.2).

Table 10.1.2 Maximum Berth Occupancy

Number of Berths in the Group	Recommended Maximum Berth Occupancy (%)
1	40
2	50
3	55
4	60
5	65
6-10	70

(Source: Port Development, UNCTAD)

10.1.2 Present Situation

Berth occupancy ratio and productivity of the study ports are summarized below.

Table 10.1.3 Utilization Records of the Study Ports (1999)

Port	Berth Occupancy Ratio (%)	Productivity for General Cargo (t/gang/hour)	Productivity for Container Cargo (box/crane/hour)
Pekanbaru	59.2	15.7	-
Jambi	42.3	21.0-21.5	6.0
Palembang	62.9	23.4-35.5	13
Pontianak	69.3	16.0	9
Kumai	80.0	210	-
Sampit	80.0	16.8	12
Samarinda	-	16.0	7.0

10.2 Development Needs

The Study Team identified the problem areas of in the study ports as follows:

(1) Pekanbaru

1) Sharp bends from Perawang upward
2) Limited expansion potential at Pekanbaru
3) Limited function of Perawang container terminal
4) Vessel size limitation at Perawang
5) Distribution of roles between Pekanbaru and Dumai

(2) Jambi

1) Long distance from the mouth to Talang Duku
2) Navigational constraints in the Batang Hari River
3) Deteriorated structure at Talang Duku
4) Vessel size limitation at Talang Duku
5) Poor access to Muara Sabak
6) Poor linkage between the new wharf and the Muara Sabak city center
7) Maintenance dredging at the mouth
8) Distribution of roles between Talang Duku and Muara Sabak

(3) Palembang

1) Long distance from the mouth to Boom Baru
2) Navigational constraints in the Musi River
3) Maintenance dredging at the outer bar
4) Insufficient container handling capacity

(4) Pontianak

1) Mixed-use of 710m long wharves
2) Demarcation of port roles between Pontianak and Nipah Kuning
3) Obstacles of yard operation at Pontianak
4) Maintenance dredging at the mouth of the Kapuas Kecil River
5) Poor port road behind the Port of Pontianak

(5) Kumai

1) Narrow cargo handling space
2) Lack of cargo handling equipment
3) Limited expansion potential at Kumai
4) Maintenance dredging at the mouth of the Kumai River

(6) Sampit

1) Narrow cargo handling space
2) Lack of cargo handling equipment
3) Limited expansion potential at Sampit
4) Maintenance dredging at the mouth of the Mentaya River

(7) Samarinda

1) Limited expansion potential at Samarinda
2) Insufficient use of 937 m long wharves
3) Blockage of port buildings in container handling yards
4) Maintenance dredging at the mouth of the Mahakam River
5) Limited use of Mangku Palas
6) Exclusive use of a passenger berth in 935 m long wharves
7) Poor port road behind the Port of Samarinda

10.3 Preliminary Port Development Scenario

10.3.1 Pekanbaru

Taking into account the present situation and future potential of Pekanbaru, the Study Team made the following assumptions:

a) The old port will gradually lose its importance
b) Perawang and Siak Haska will continue to share the public container cargo generated around the city of Pekanbaru
c) Perawang will attract some of the container cargo currently handled in private wharves
d) However, private wharves will continue to play a dominant role in the transportation along the Siak River

10.3.2 Jambi

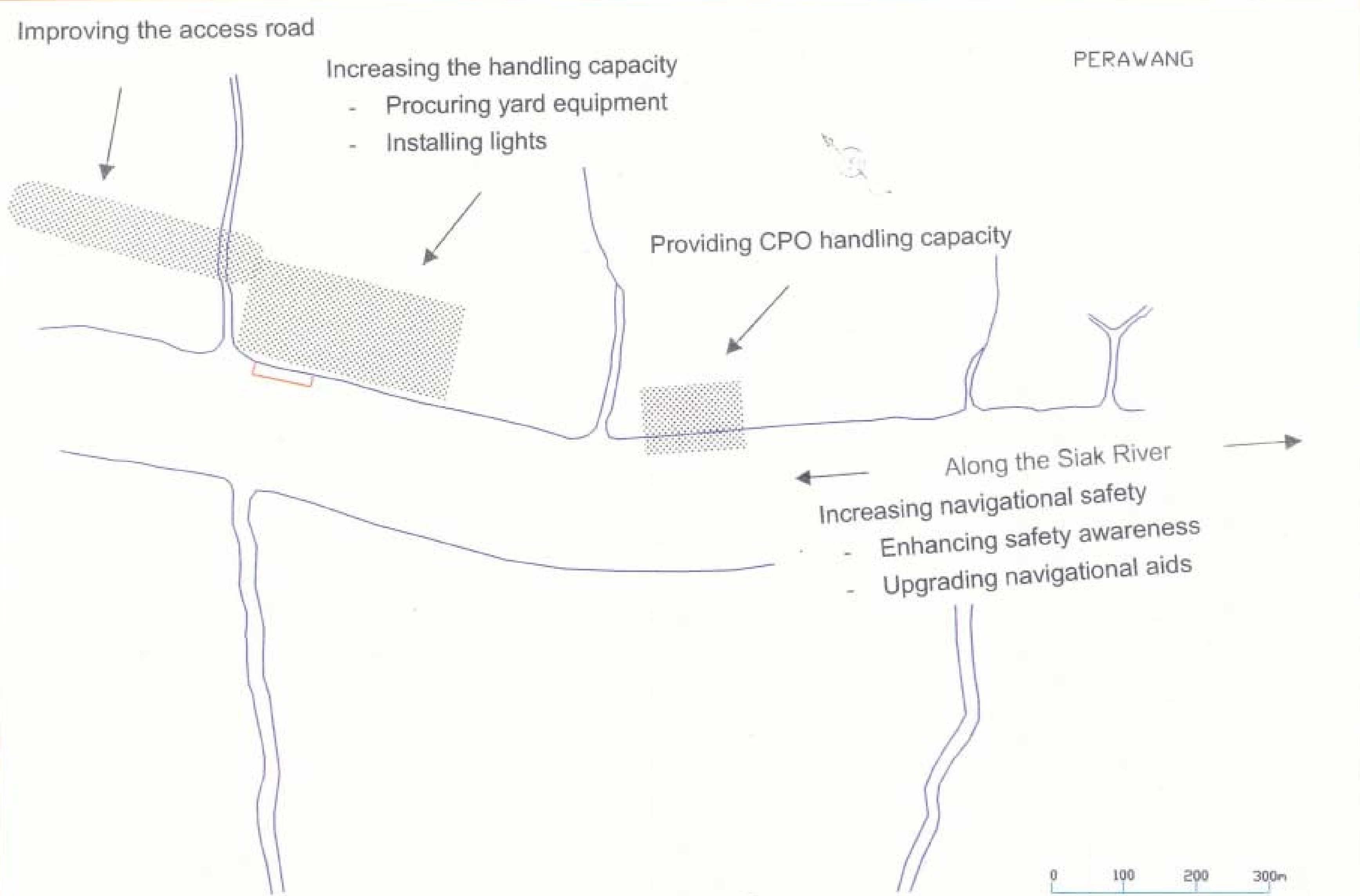
Taking into account the present situation and future potential of Jambi, the Study Team made the following assumptions:

a) Talang Duku will continue to cater for a large part of the public cargo generated around the city of Jambi due to its proximity to users
b) Muara Sabak will serve as an industrial base for CPO processing and thus attract some of the bulk cargo currently handled in private wharves
c) Muara Sabak will also attract some of the container cargo currently handled in private wharves
d) Kuala Tungkal's role in cargo transportation will continue to be limited due to its shallow draft

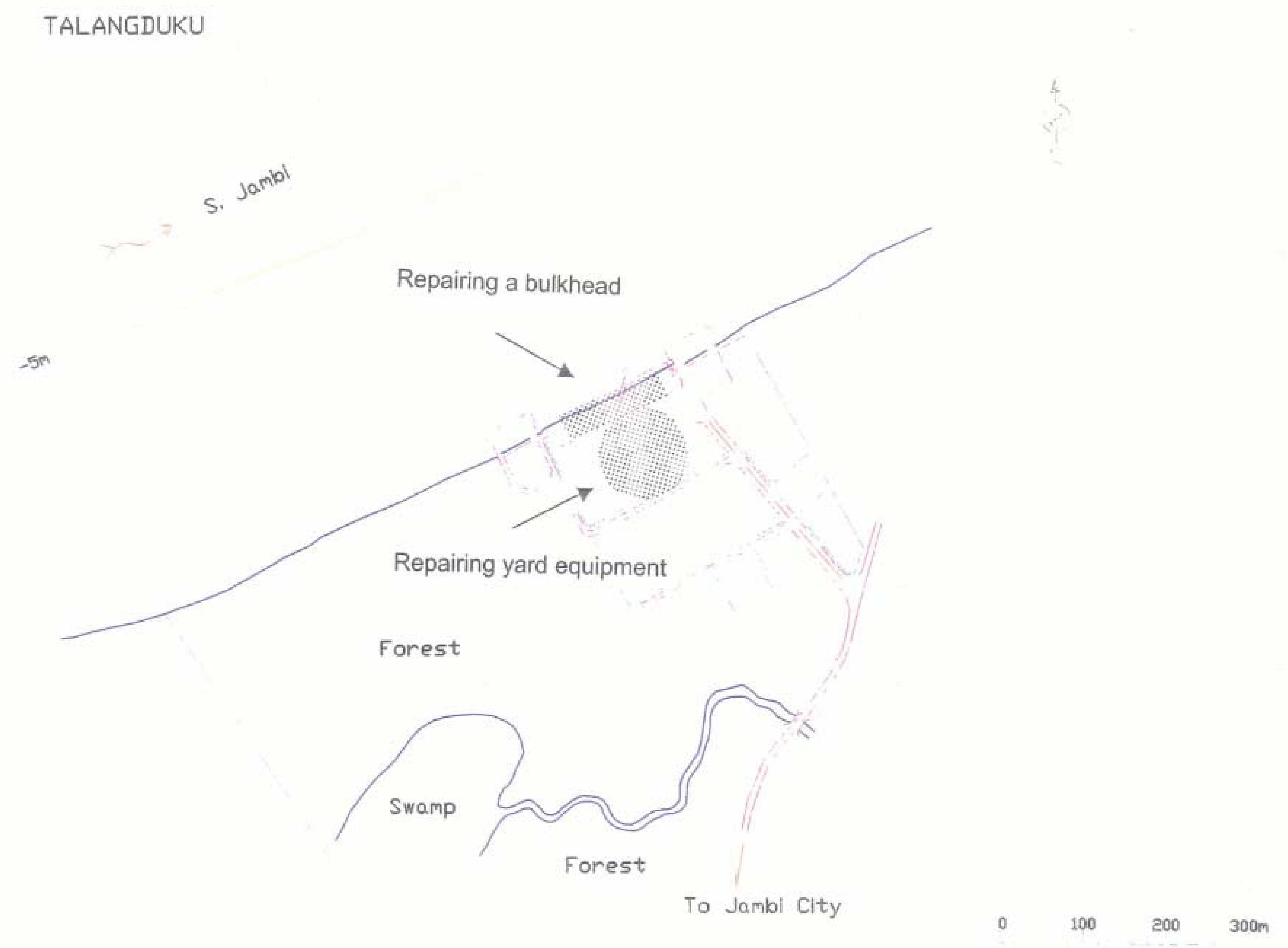
10.3.3 Palembang

Taking into account the present situation and future potential of Palembang, the Study Team made the following assumptions:

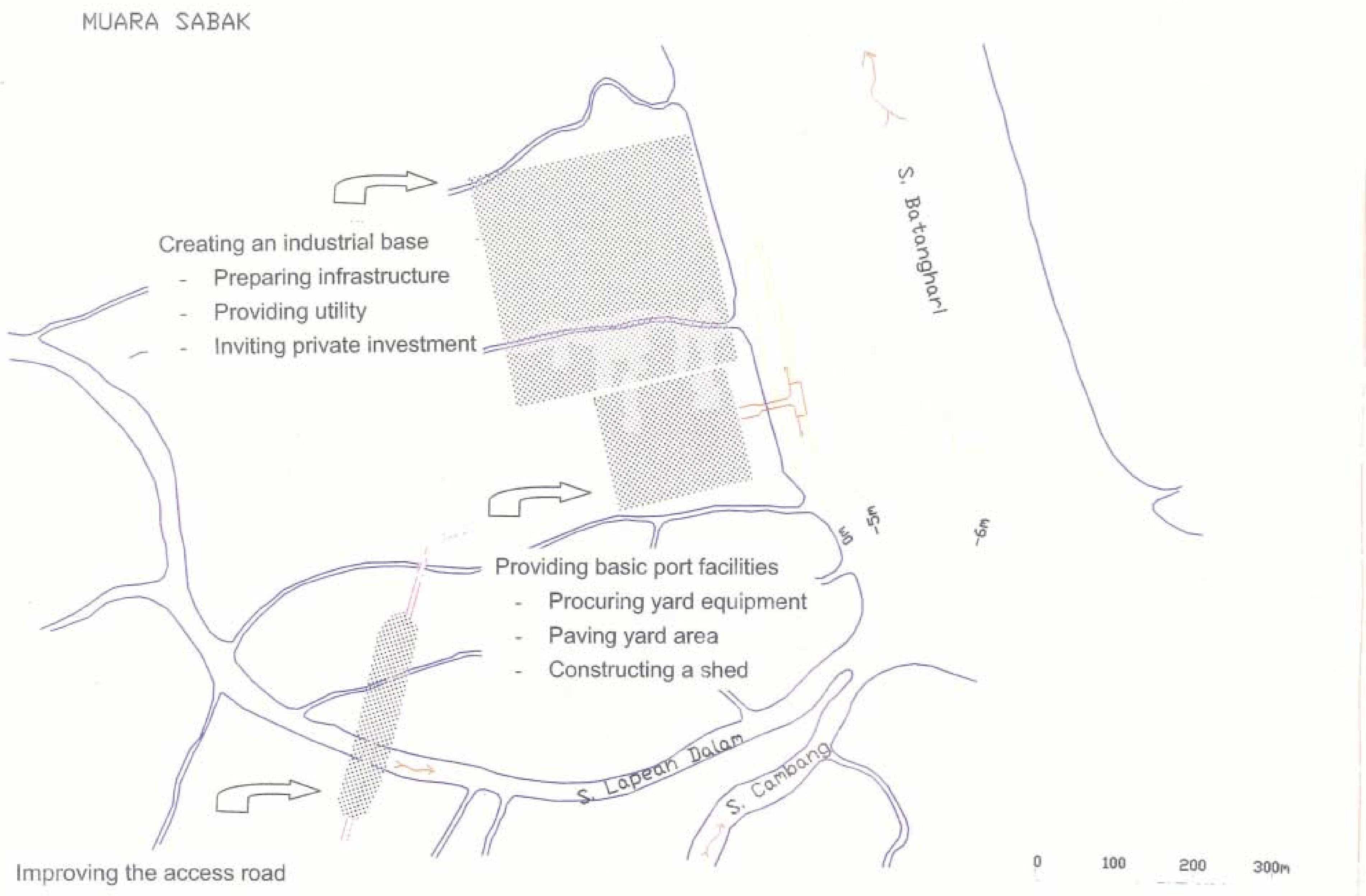
a) Boom Baru will continue to serve as a main port of Palembang both as a public port and a private port due to the strong economic activity behind the port
b) Accordingly, optimization of maintenance dredging in the Musi River will remain an important issue
c) Sungai Lais will serve as a CPO terminal in the near future
d) Sungai Lais will start catering for public cargo after Boom Baru becomes saturated
e) Tanjung Api-Api will start to serve as a coal terminal if either of the following events take place:
    - The coal mining company decides to transfer its cargo from Panjang
    - The coal mining company greatly increases its production and needs a new outlet other than Panjang



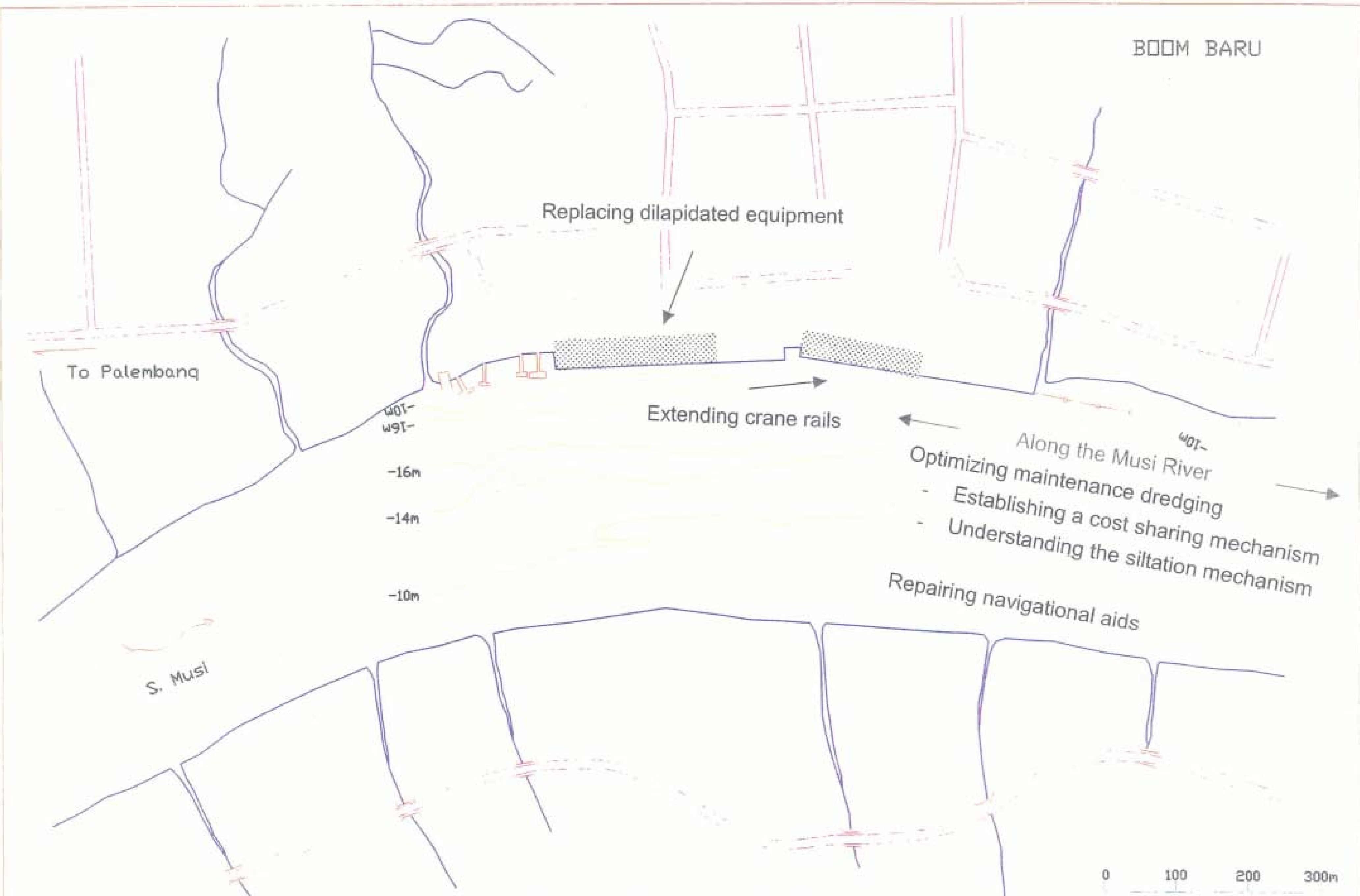
Short-term Measures at Perawang



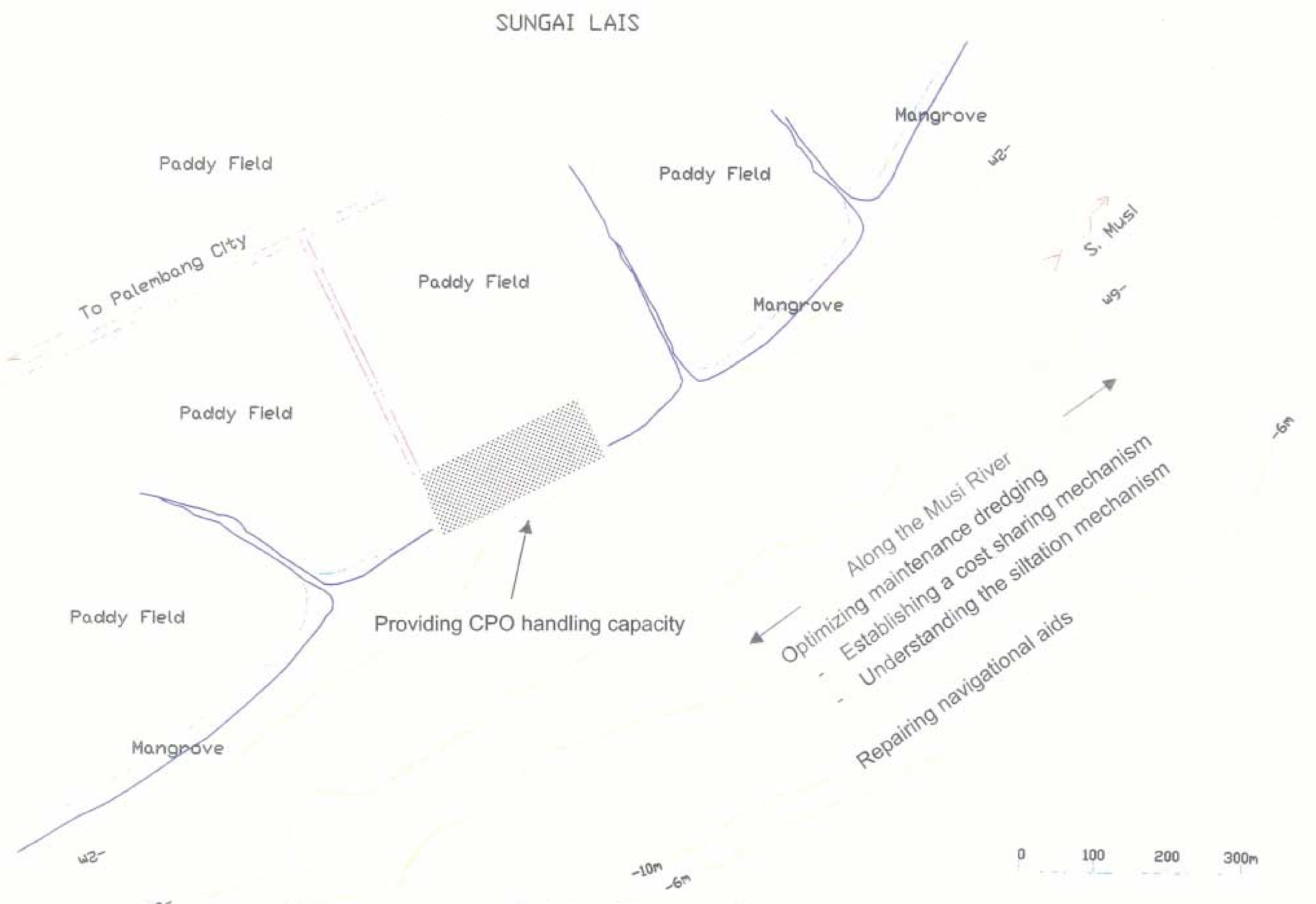
Short-term Measures at Talang Duku



Short-term Measures at Muara Sabak



Short-term Measures at Boom Baru



Short-term Measures at Sungai Lais

10.3.4 Pontianak

a) The existing Pontianak port will continue to serve as a main public port of West Kalimantan, at which the growing container/non-container cargo and passenger will be handled.

b) Accordingly, optimization of maintenance dredging in the Kapuas Kecil River in the short run and siltation prevention measures there in the long run, will remain an important issue.

c) Nipah Kuning will play an important role to serve as a base port of traditional and small vessel cargoes, and will continue to be fit for use and expanded without delay, depending on the demand.

d) A new port serving as both a CPO terminal with oil-processing facilities and a non-container cargo terminal, will be created on the riverside such as Jungkat

e) The passenger terminal will be relocated to an appropriate place along the river such as in front of the riverside park of Pontianak to actualize the efficient loading/unloading system at Pontianak.

10.3.5 Kumai

a) The existing Kumai port will perform the key role as a cargo and passenger terminal in the region until a new container/general cargo terminal at Bumiharjo (11km up the stream) is open in the year 2010. The role of the existing Kumai port will be reduced to a passenger terminal, after the opening of the new container/general cargo terminal.

b) A new port at Bumiharjo will be open as a CPO terminal with oil-processing facilities by the year 2005, in accordance with CPO plantation development which is accelerated in Central Kalimantan.

c) Accordingly, optimization of maintenance dredging in the Kumai River in the short run and siltation prevention measures there in the long run, will remain an important issue.

10.3.6 Sampit

a) The existing Sampit port will perform the key role as a cargo and passenger terminal in the region until a new container/general cargo terminal at Bagendang is open in the year 2010. The role of the existing Sampit port will be reduced to a passenger terminal, after the opening of the new container/general cargo terminal.

b) A new port at Bagendang (22km down the stream) will be open as a CPO terminal with oil-processing facilities by the year 2005, in accordance with CPO plantation development which is accelerated in Central Kalimantan.

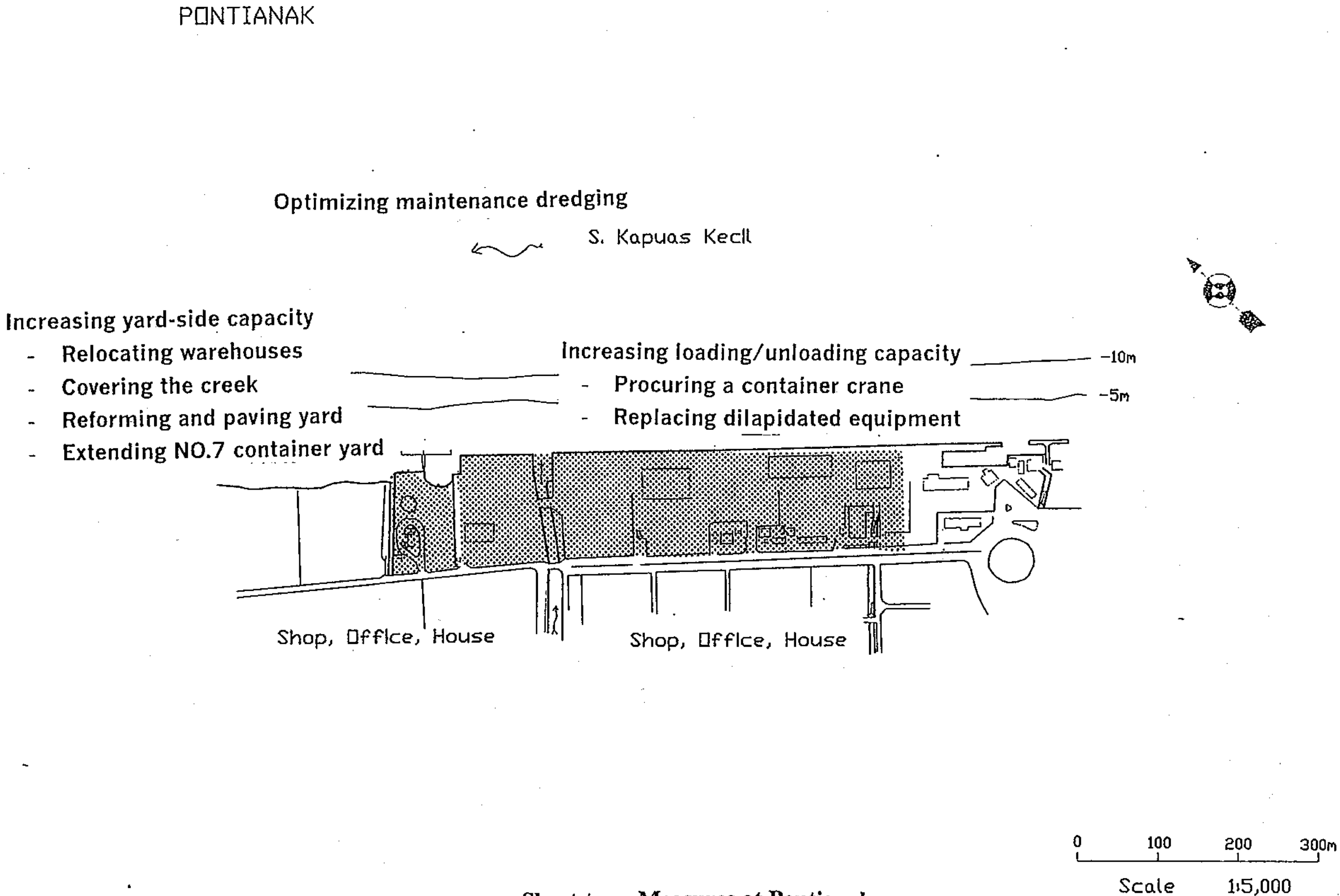
c) Accordingly, optimization of maintenance dredging in the Mentaya River in the short-run and siltation prevention measures there in the long run, will remain an important issue.

10.3.7 Samarinda

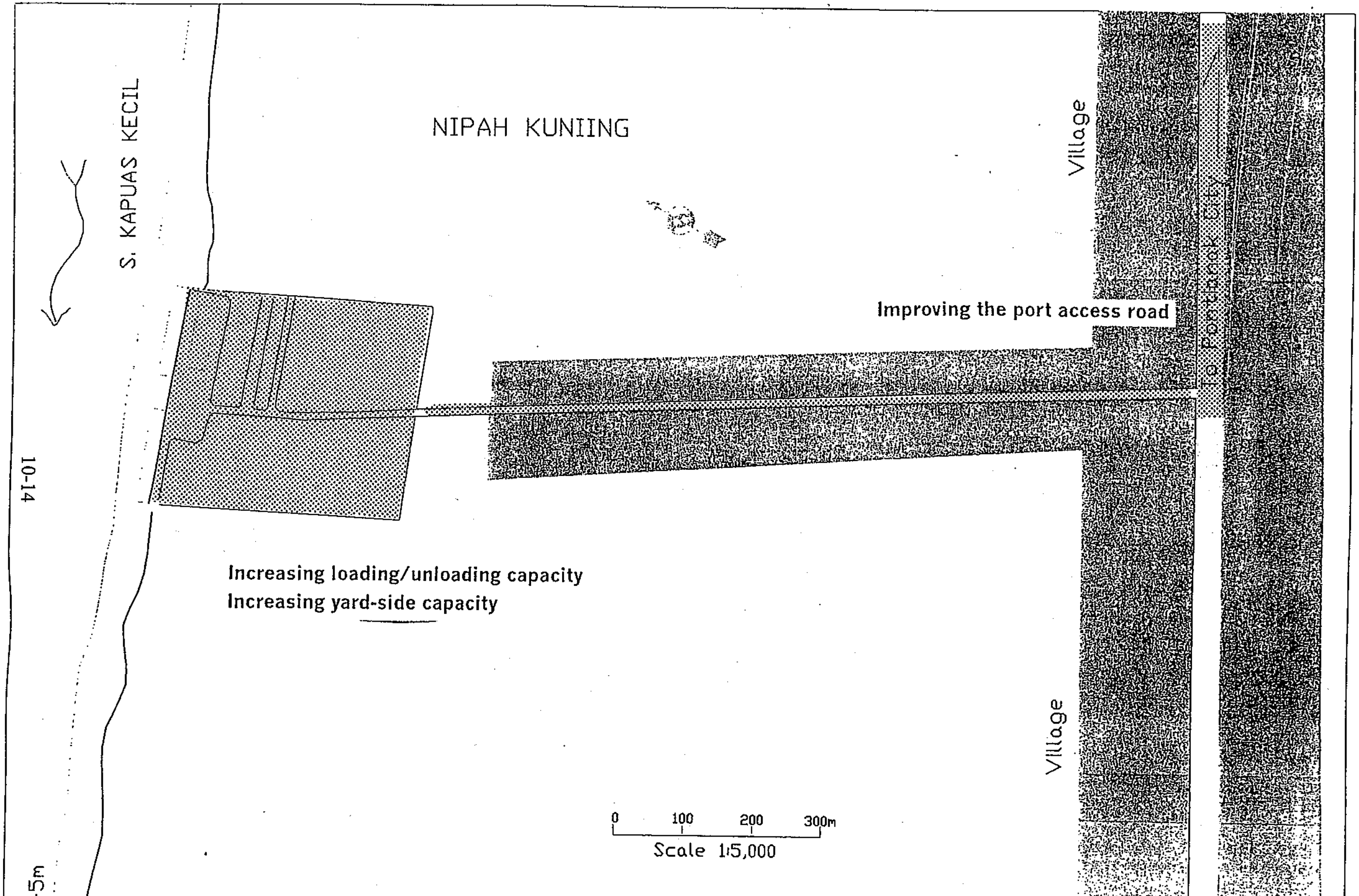
a) The existing Samarinda port will continue to serve as a non-container cargo and passenger terminal in East Kalimantan, at which the growing passenger and non-container cargo such as CPO, rubber, logs, plywood and wooden products will be handled. Thus, it will attract some of bulk, bag and general cargo currently handled in private wharves.

b) Accordingly, optimization of maintenance dredging in the Mahakam River in the short run and siltation prevention measures there in the long run, will remain an important issue.

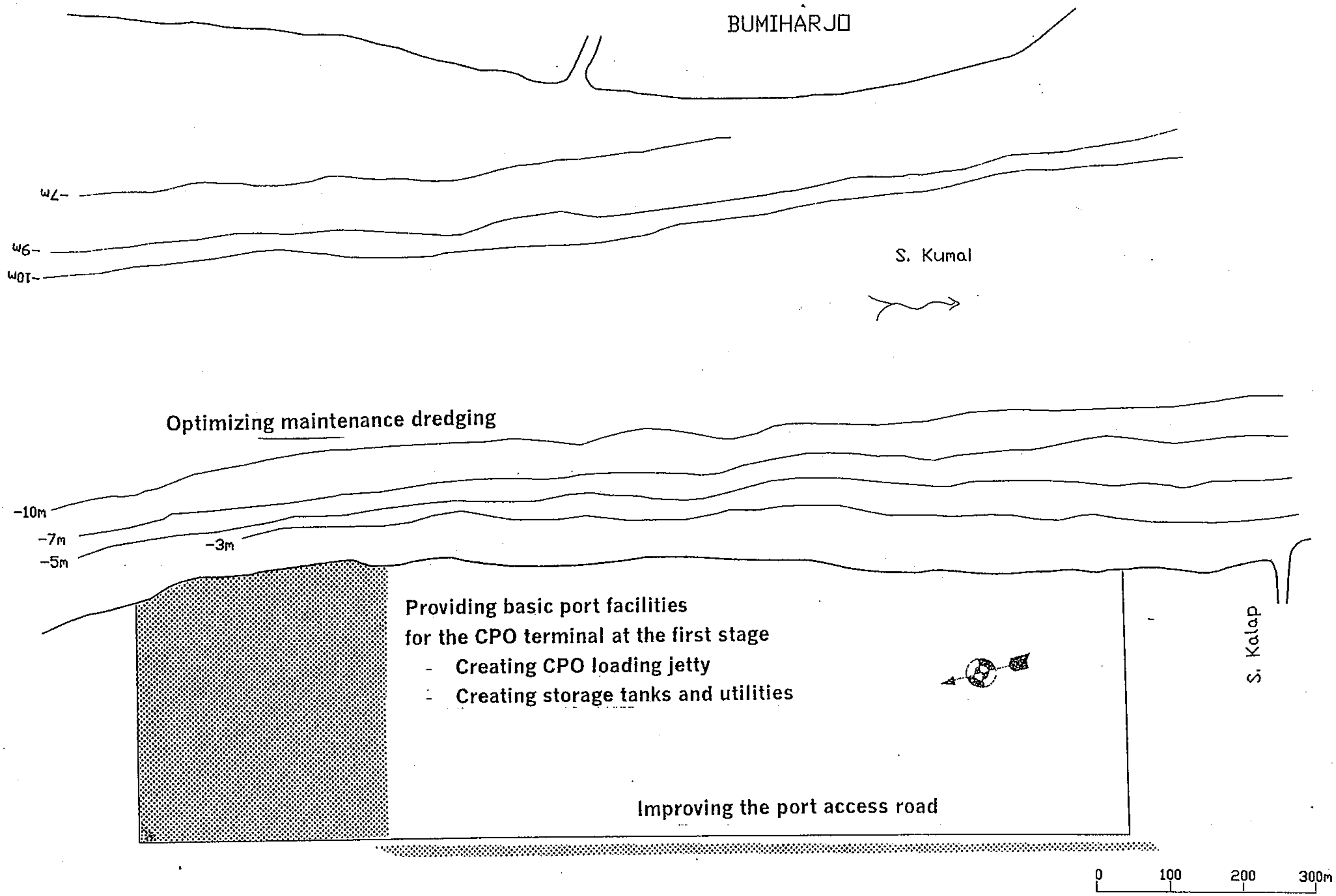
c) A new port serving as a container/general cargo terminal will be created either in the oceanfront or on the riverside, in order to catch up with growing cargo demand generated by strong industrial activity within the port hinterland. Thus, it will attract some of bulk, bag and general cargo currently handled in private wharves.



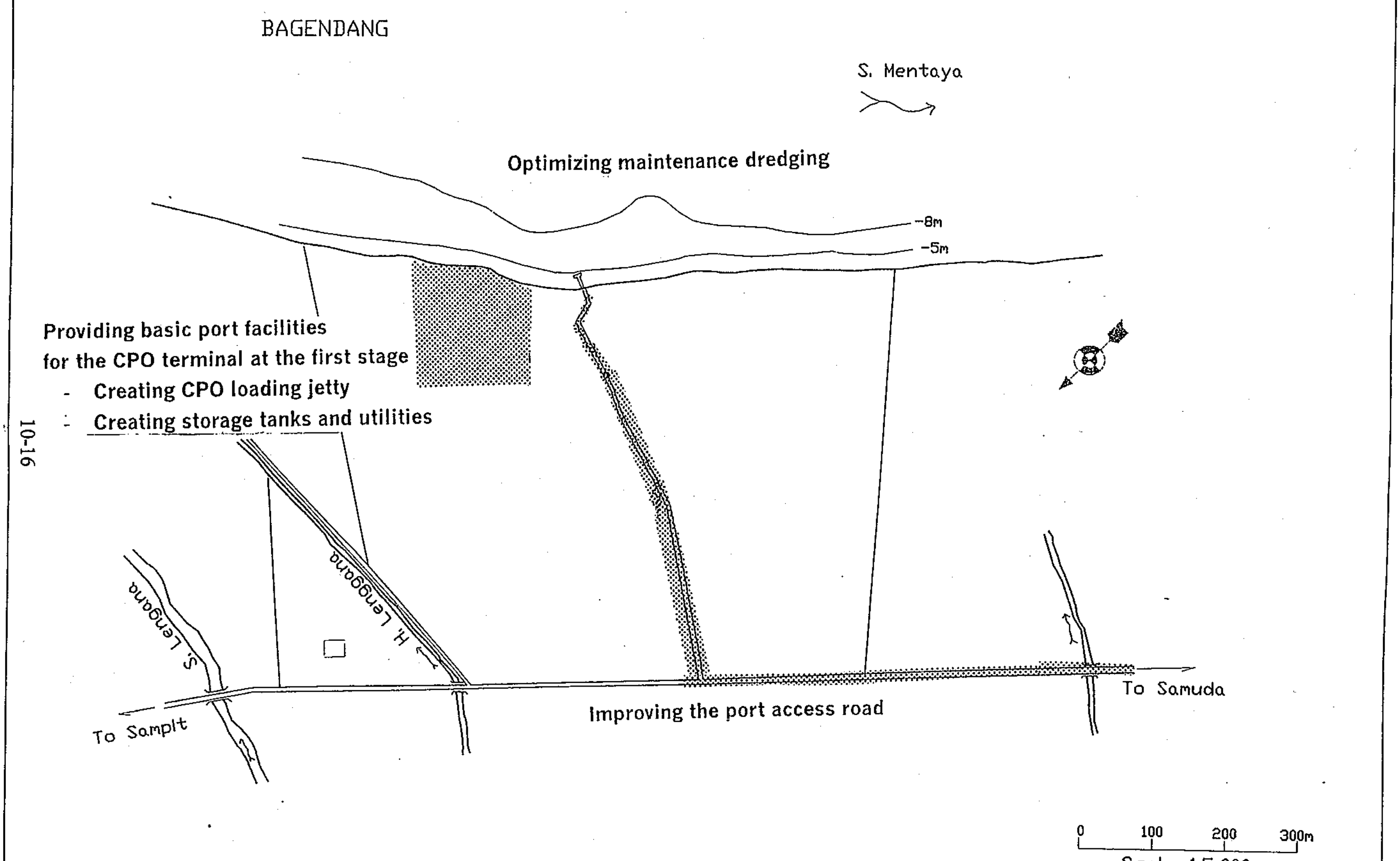
Short-term Measures at Pontianak



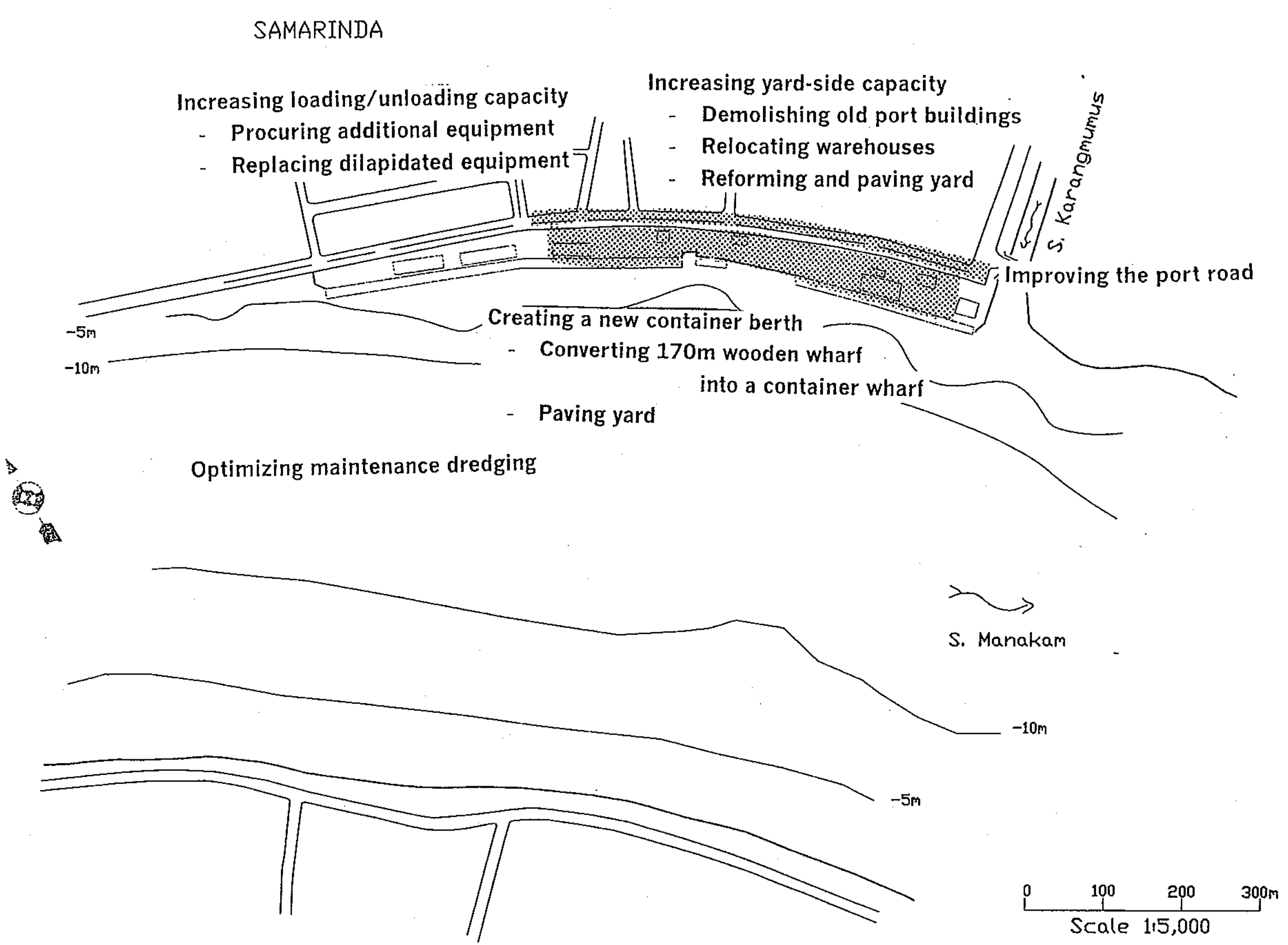
Short-term Measures at Pontianak(Nipah Kuning)



Short-term Measures at Kumai(Bumiharjo)



Short-term Measures at Sampit(Bagendang)



Short-term Measures at Samarinda

11. PRIOR EFFORTS TO ESTABLISH CRITERIA ON THE NATION'S PORTS

11.1 JICA Study on the Port Development Strategy

JICA Study on the Port Development Strategy proposed a container port network of Indonesia. In selecting prospective ports as a transshipment hub and a mother port, the Study prepared a set of criteria. Cargo demand and cost aspects were quantified in the Study. Among the aspects mentioned in the criteria, demand forecast was given the top priority.

11.2 TSSS Study (Transport Sector Strategy Study)

The government of Indonesia carried out a transportation sector study (TSSS Study) to work out a national transport strategy. This study is designed to prepare policy recommendations in response to the dramatically changed economic and institutional environments of the Indonesian transportation sector. TSSS Study proposed a set of criteria to select priority projects taking into account the policy-mix proposed by PROPENAS. These criteria include a variety of aspects and a time factor.

11.3 DGSC Network Plan

DGSC and IPC are jointly preparing the Network Development Plan of Port Infrastructure in the National Port Arrangement. It identifies criteria for classifying the nation's ports. These criteria are determined according to the cargo throughput in a port.

12. SELECTION OF THE PRIORITY PORTS

12.1 Project Profiles and Evaluation Criteria

The Study Team prepared preliminary development scenarios for the seven ports (see section 10.3). The two priority ports are selected assuming these scenarios. The proposed projects at the seven ports are outlined below (Table 12.1.1).

Table 12.1.1 Major Projects Envisaged in the Study Ports

<table>
<tr><th>Port</th><th>Project site</th><th>Project profiles</th></tr>
<tr><td rowspan="3">Pekanbaru</td><td>Pekanbaru</td><td>Expanding the Siak Haska Terminal</td></tr>
<tr><td>Perawang</td><td>Improving the access road
Providing CPO handling capacity
Expanding the container terminal</td></tr>
<tr><td>Siak River</td><td>Installing navigation aids</td></tr>
<tr><td rowspan="2">Jambi</td><td>Talang Duku</td><td>Expanding the terminal</td></tr>
<tr><td>Muara Sabak</td><td>Improving the access road
Providing yard-side capacity
Creating an industrial base
Expanding the container terminal</td></tr>
<tr><td rowspan="4">Palembang</td><td>Boom Baru</td><td>Procuring additional equipment</td></tr>
<tr><td>Sungai Lais</td><td>Providing CPO handling capacity
Creating public terminals</td></tr>
<tr><td>Musi River</td><td>Repairing navigation aids
Optimizing maintenance dredging</td></tr>
<tr><td>Tanjung Api-Api</td><td>Creating a deep sea-port and an industrial base</td></tr>
<tr><td rowspan="3">Pontianak</td><td>Pontianak</td><td>Expanding the existing container terminal
Relocating the passenger terminal</td></tr>
<tr><td>Nipah Kuning</td><td>Improving yard-side capacity
Improving the access road to the site</td></tr>
<tr><td>New River Port</td><td>Creating a new CPO/non-container cargo terminal</td></tr>
<tr><td rowspan="2">Kumai</td><td>Kumai</td><td>Procuring additional loading/unloading equipment</td></tr>
<tr><td>Bumiharjo</td><td>Creating a CPO terminal
Improving the access road to the site
Creating the full-scale CPO and container/general cargo terminal</td></tr>
<tr><td rowspan="2">Sampit</td><td>Sampit</td><td>Procuring additional loading/unloading equipment</td></tr>
<tr><td>Bagendang</td><td>Creating a CPO terminal
Improving the access road to the site
Creating the full-scale CPO and container/general cargo terminal</td></tr>
</table>

Samarinda	Samarinda	Converting the wooden wharf into a new container berth Increasing yard-side capacity, including demolishing old port buildings Relocating the passenger terminal
	Mangku Palas	Providing cargo handling equipment
	New Port (Oceanfront or riverside)	Creating a new container/general cargo terminal Strengthening the linkage between the new port and Samarinda.

The Study Team carried out an overall evaluation based on the analysis by several evaluation criteria. Due to the nature of the criteria, the evaluation process is mostly qualitative.

12.2 Conformity to the Nation's Goals

PROPENAS identified the following policy goals: decentralization, poverty alleviation, competitive industries, rehabilitation, private sector participation, and improved access to remote areas. After examining the target ports according to these goals, the Study Team concluded that Jambi, Palembang, and Samarinda are slightly more recommendable for further study than four other ports.

12.3 Capacity Requirements

The Study Team examined whether the river ports need urgent expansion due to capacity constraints. The Team evaluated berth occupancy ratio, productivity, and demand growth rate of each port and compared them. The Study Team found out that every port had the need for capacity increase.

12.4 Impacts on the Regional Economy

The Study Team examined the impacts of river port development on the regional economy in two viewpoints, region's dependence on the port and improvement of the region's economic potential. To evaluate the former aspect, the Team used per capita export value and total international trade volume as indicators. The Study Team concluded that Pekanbaru and Samarinda are slightly more recommendable in this regard.

12.5 Transportation Network and Regional Development

The following aspects were evaluated in this section:

- Alternative transportation routes
- Prospects of the key supporting infrastructure

- Prospects of the key regional development

In this regard, Jambi, Palembang, and Pontianak have no reliable alternative transportation modes. On the other hand, Jambi, Palembang, Kumai, and Sampit have already started to develop supporting infrastructure, and thus port development in these ports are more realistic than the other ports.

12.6 Engineering Feasibility

The focal point is the cost of construction and maintenance as well as engineering risks.

(1) Condition of river channel

The wider and/or deeper channels will be evaluated as more advantageous for saving construction cost as well as maintenance cost.

The site of Muara Sabak is located nearer the river mouth of Batanghari River and also has the advantage that larger sizes of vessels are navigable when compared to the existing Jambi Port (Talang Duku).

The condition of maintenance dredging has a direct relation to the maintenance cost of the port and the navigation channel. Except for Sungai Siak (Pekanbaru) where maintenance dredging is negligible, the sites along Sungai Batanghari have the smallest maintenance dredging among the study areas.

(2) Design conditions

Design condition has direct relation with port availability, design freedom of the port facilities as well as the construction cost.

The sites of Tanjung Apiapi (Palembang) and Marang Kayu (Samarinda) are considered disadvantageous because of the strong accretive and advancing shoreline.

At the Jambi (Talang Duku) site, water level fluctuation in the river between rainy season and dry season is large. This is a restraint for design of the port facilities and effective cargo handling at the port.

(3) Viability of project

A term “cost factor” is added to identify the elements that will be necessary to implement the development and/or improvement but will cause cost-increase. For example, the construction of an access road is necessary for the development at three sites: Muara Sabak (Jambi), Tanjung Apiapi (Palembang) and Marang Kayu (Samarinda).

Difficulty in land acquisition is assumed in the re-development of the existing port area at Pekanbaru, Pontianak, Kumai, Sampit and Samarinda. Improvement of the quay structures of the present Samarinda Port will be necessary but costly.

Construction of breakwater and sand-barrier to cope with the rough sea and littoral sand drift will be necessary in the development of seaport at Marang Kayu.

12.7 Economic Criteria for Priority Port Selection

Initially we started with 12 economic criteria including various types of risk. It became apparent that this was too many and eventually these were refined to 5 main economic criteria as follows:

1) Cost (or more correctly) cost per tonne of capacity provided
   This looks at the development cost per tonne of capacity provided. So that expansion in situ ranked lowest (generally) as city centre sites are expensive and difficult to expand and greenfield, river, sites cheapest on development costs alone. New sea ports were also expensive if dredging and breakwaters were required.
2) Transportation cost savings
   The ability to provide efficient operations and serve larger vessels leads to lower transport costs
3) Additional land transport costs
   Sites in situ involve no additional costs, although city centres are becoming more congested and industries are moving out to the edge of cities in many cases
4) Wider economic development criteria
   This included more intangible type effects such as regional development, employment creation and industrial promotion
5) Economic risk
   This covered a range of risks including lack of financial and economic sustainability

In subjective terms, i.e. until the evaluation process was completed, it was complicated to compare conflicting criteria. For example, new sea ports are expensive and involve additional access cost and involve high risk. They are, however, cost effective and can provide a substantial boost to regional industrial and commercial development. Expansion of ports in situ are cheaper in absolute terms for small additions of capacity but are usually very difficult to implement and do not provide an economic or efficient solution to the problem of lack of capacity. New river ports, located near the existing port can offer an effective compromise.

Obviously, economic criteria are only useful when considered in conjunction with other criteria considered in this study.

12.8 Environmental Consideration

The evaluation of environmental considerations cover 2 components: namely, 1)Social environmental aspects and 2)Natural environmental aspects. The results of the evaluation are shown in the following table.

Study Ports	Existing/ New Port	Study Site	Environmental Description
Pekanbaru	Existing Port	Pekanbaru	➢ Relocation of people: **Yes** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Perawang	➢ Relocation of people: **No** ➢ **No** rare Fauna and Flora
Jambi	Existing Port	Talang Duku	➢ Relocation of people: **No** ➢ Fishery Ground / 70 fishermen ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Muara Sabak	➢ Relocation of people: **No** ➢ Fishery ground / 80 fisherman, fishery port required ➢ **No** rare Fauna and Flora, but small mangroves
Palembang	Existing Port	Boon Baru	➢ Relocation of people: **Yes** ➢ Large/small, boats are crowded**, risk of collision** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Sungai Lais	➢ Relocation of people: **No** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Tg.Api-Api	➢ Relocation of people: **No** ➢ **Marvelous mangrove(Api-Api)communities**
Pontianak	Existing Port	Pontianak	➢ Relocation of people: **Yes** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Jungkat	➢ Relocation of people : **Yes** ➢ White Belly Sea Eagle nesting
Kumai	Existing Port	Kumai	➢ Relocation of people: **Yes** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Bumiharjo	➢ Relocation of people: **No** ➢ **No** rare Fauna and Flora, but small mangroves
Sampit	Existing Port	Sampit	➢ Relocation of people: **Yes** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Bagendang	➢ Relocation of people: **No** ➢ **No** rare Fauna and Flora
Samarinda	Existing Port	Samarinda	➢ Relocation of people: **Yes**, Commercial area ➢ Large/small, boats are crowded**, risk of collision** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Palaran	➢ Relocation of people: **Yes** ➢ **Negative** impact of traffic increasing ➢ **No** rare Fauna and Flora
	New Port	Marang Kayu	➢ Relocation of people: **No** ➢ **Impact from dredging work because of shallow bay** ➢ **No** rare Fauna and Flora, but small mangroves

12.9 Overall Evaluation

The Study Team followed the following principles in proposing the two ports for further study.

1) Bearing in mind that this Study should give the Indonesian side a guideline for river port development in general, it would be better to study the ports suffering from the most acute symptoms peculiar to river ports, narrow port area, siltation, and draft limitation.
2) One priority port in Sumatra and another in Kalimantan should be selected.
3) Ports with a current development plan do not have an urgent need for a JICA study at this time.
4) For the smooth conduct of the Study, safety at the project sites needs to be guaranteed.

The Team proposed Jambi in Sumatra and Samarinda in Kalimantan for further study. Samarinda was proposed as its port area is the most heavily congested among the seven ports and needs urgent attention. Samarinda has no port master plan either. On the other hand, the other three ports in Kalimantan, Pontianak, Kumai, and Sampit, have their port master plans. Creation of a new terminal is already underway in Kumai and Sampit. There is also security concern for Kumai and Sampit.

Jambi was proposed as it has the most severe draft limitation, requiring vessels a tidal operation to call at Talang Duku. There is no port master plan covering Jambi Port, Talang Duku, Muara Sabak, and Kuala Tungkal.