

Main Report (III): Short-term Development Plan, etc

Final



The Study on the Red River Inland Waterway Transport System in the Socialist Republic of Vietnam



March 2003

**The Overseas Coastal Area Development Institute of Japan (OCDI)
Japan Port Consultants, Ltd. (JPC)**

SSF

JR

03-70

The following foreign exchange rates are applied in this study:

US\$1.00 = VND(Vietnam Dong)15,000 = JP¥125

as of December 07, 2001

Japan International Cooperation Agency (JICA)
Ministry of Transport (MOT)

Main Report (III): Short-term Development Plan, etc.

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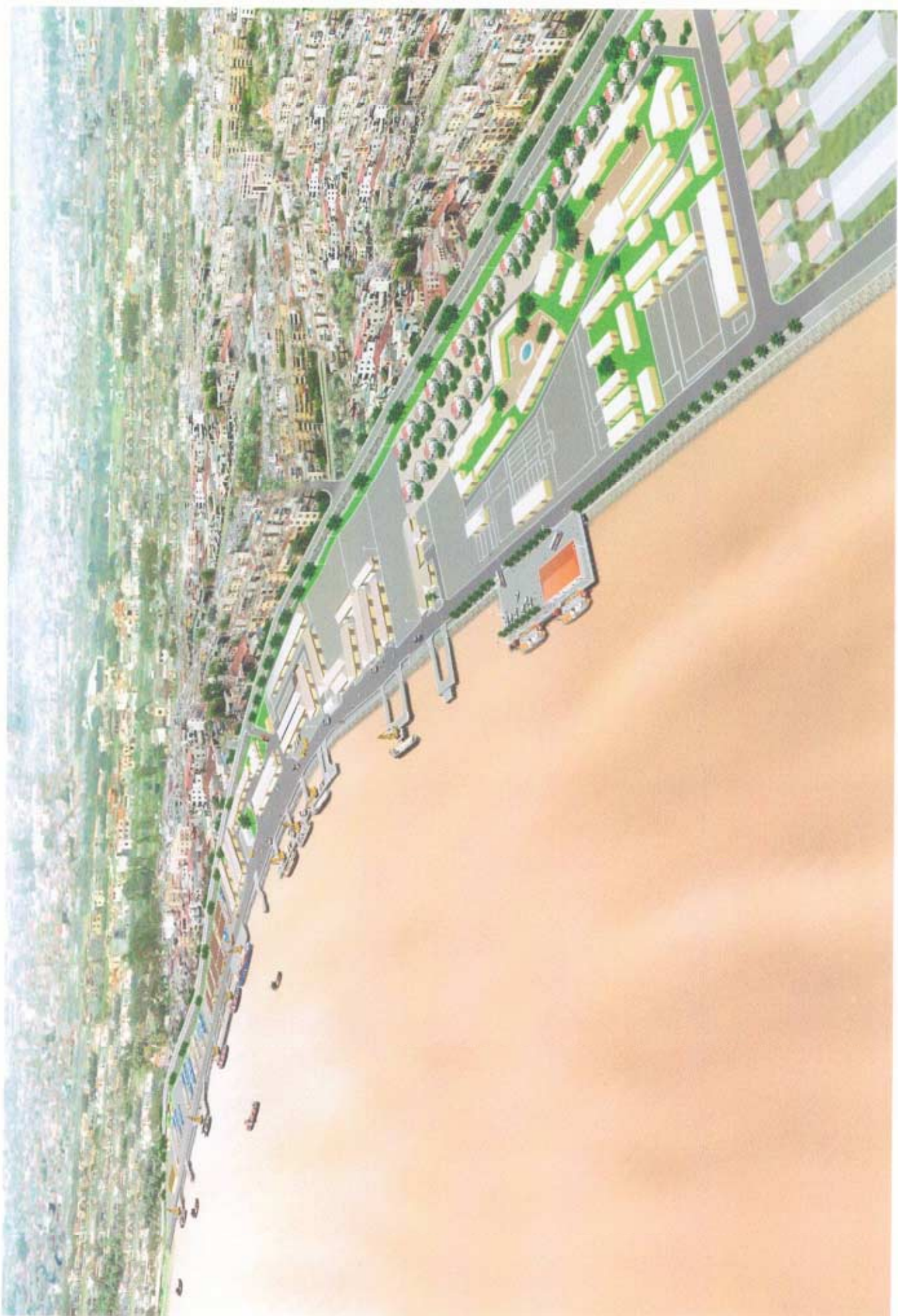


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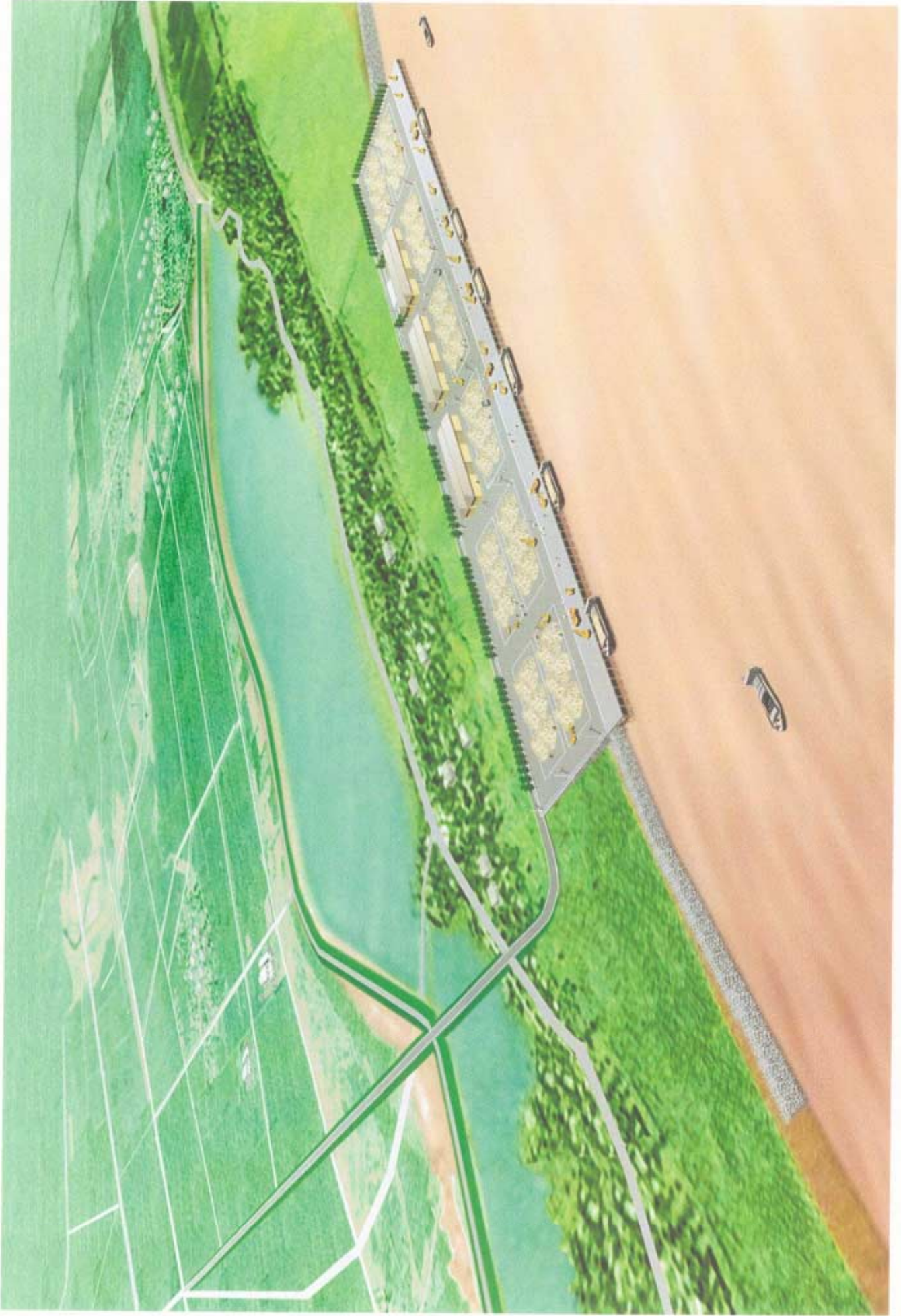
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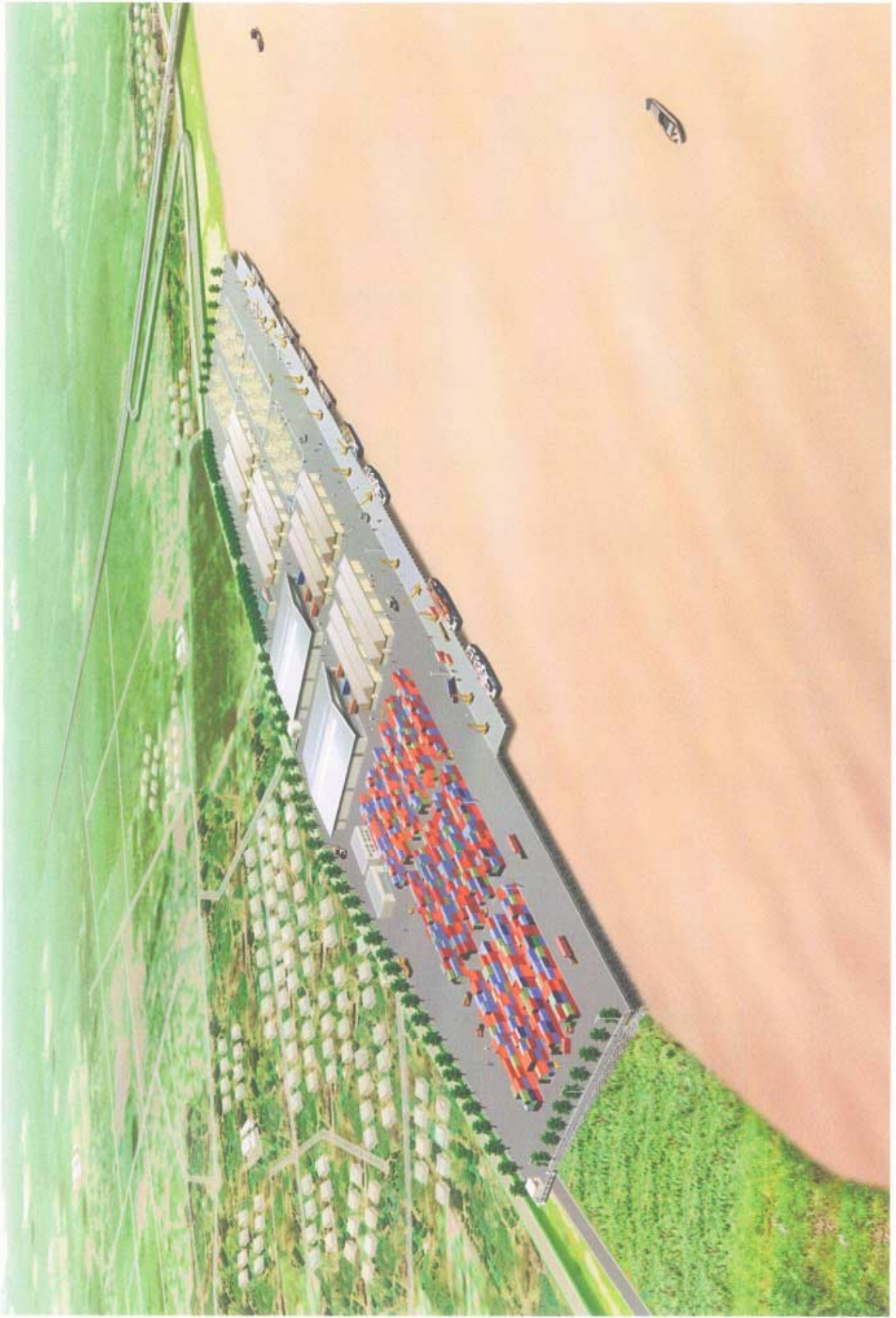
Master Plan of Hanoi Port (2020)



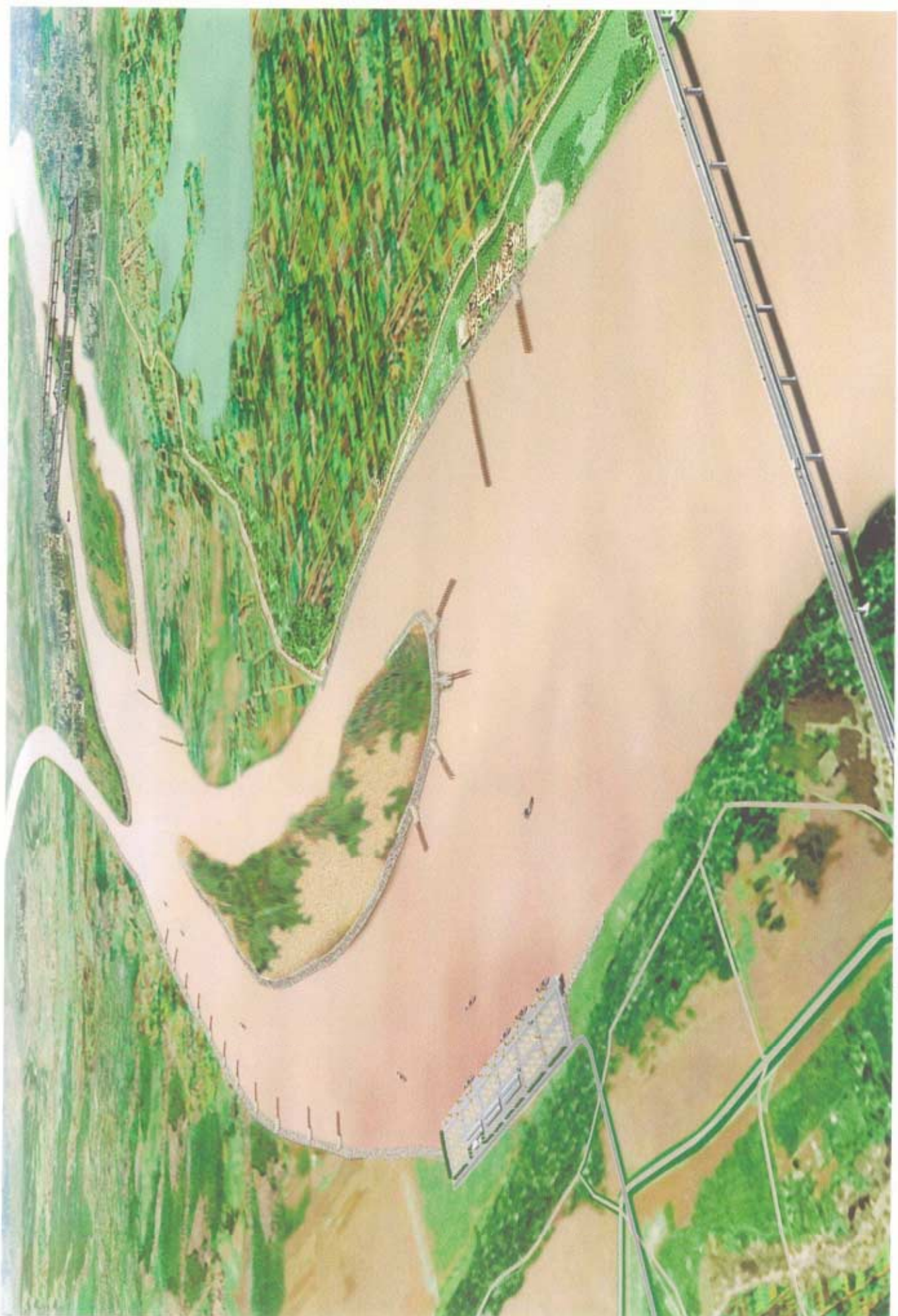
Master Plan of Khuyen Luong Port (2020)



Master Plan of New North Port (2020)



Master Plan of New East Port (2020)



Master Plan of Channel Stabilization Facilities (2020)

PREFACE

In response to a request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct a study on the Red River Inland Waterway Transport System in the Socialist Republic of Vietnam and entrusted the study to the Japan International Cooperation Agency (JICA).

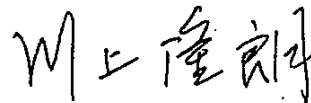
JICA dispatched a study team to Vietnam three times between December 2001 and January 2003, which was headed by Mr. Takechiho Tabata (December 2001 - June 2002) and Mr. Hisao Ouchi (June 2002 - January 2003) of the Overseas Coastal Area Development Institute of Japan (OCDI), and was comprised of OCDI and Japan Port Consultants, Ltd. (JPC).

The team held discussions with the officials concerned of the Government of the Socialist Republic of Vietnam and conducted field surveys at the study area. Upon returning to Japan, the study team conducted further studies and prepared this final report.

I hope that this report will contribute to this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Socialist Republic of Vietnam for their close cooperation extended to the study team.

March 2003



Takao Kawakami
President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

March 2003

Mr. Takao Kawakami
President
Japan International Cooperation Agency

Dear Mr. Kawakami:

It is my great pleasure to submit herewith the Final Report of the Study on the Red River Inland Waterway Transport System in the Socialist Republic of Vietnam.

The study team comprised of the Overseas Coastal Area Development Institute of Japan (OCDI) and Japan Port Consultants, Ltd. (JPC) conducted surveys in Vietnam over the period between December 2001 and January 2003 as per the contract with the Japan International Cooperation Agency (JICA).

The study team compiled this report, which proposes the Long-term Strategy for the Inland Waterway Transport (IWT) System in the Red River Delta for the year 2020 as well as the Master Plan and the Short-term Development Plan for the IWT System in the Red River segment through Hanoi for the year 2020 and 2010 respectively, through close consultations with officials of the Ministry of Transport (MOT) and other authorities concerned of the Vietnamese Government.

On behalf of the study team, I would like to express my heartfelt appreciation to MOT and other authorities concerned of the Government of the Socialist Republic of Vietnam for their diligent cooperation and assistance and for the heartfelt hospitality extended to the study team.

I am also very grateful to your Agency, the Ministry of Foreign Affairs, the Ministry of Land, Infrastructure and Transport and the Embassy of Japan in Vietnam for valuable suggestions and assistance through this study.

Yours faithfully,

久内 久夫

Hisao Ouchi
Team Leader

The Study on the Red River Inland Waterway Transport
System in the Socialist Republic of Vietnam

ABBREVIATION LIST

| | |
|-----------|---|
| AAGR | Average Annual Growth Rate |
| ADB | Asian Development Bank |
| AFTA | ASEAN Free Trade Agreement |
| APA | ASEAN Ports Association |
| ASEAN | Association of South East Asian Nations |
| BCR | Benefit Cost Ratio |
| BOT | Build, Operate and Transfer |
| CCTDI | Consulting Center for Transport Development Investment under TDSI |
| CCWACO | Consulting Company of Waterway Construction under VN Waterway Construction Corp |
| CFS | Container Freight Station |
| CIF | Cost, Insurance and Freight |
| CMB | Construction Consulting Company for Maritime Building under VINAMARINE |
| CSW | Channel Stabilization Works |
| CV | Cheval Vapeur (French expression, = HP: horse power) |
| CY | Container Yard |
| DC | Distribution Center |
| DNC Canal | Day - Ninh Co Canal |
| DSI | Development Strategy Institute under MPI |
| DWT | Dead Weight Tonnage |
| EDI | Electronic Data Interchange |
| EIA | Environment Impact Assessment |
| EPZ | Export Processing Zone |
| E/S | Engineering Service |
| ETA | Estimated Time of Arrival |
| FCL | Full Container Load |
| FDI | Foreign Direct Investment |
| FIRR | Financial Internal Rate of Return |
| FOB | Free on Board |
| GDP | Gross Domestic Product |
| GOJ | Government of Japan |
| GOV | Government of the Socialist Republic of Vietnam |
| GPS | Global Positioning System |
| GRT | Gross Registered Tonnage |
| GSO | General Statistical Office |
| GT | Gross Tonnage |
| HCMC | Ho Chi Minh City |
| HDI | Human Development Index |
| HHWL | Highest High Water Level |

| | |
|---------------|--|
| HNPC | Hanoi People's Committee |
| HWL5% | 5% Occurrence Water Level |
| ICD | Inland Clearance Depot |
| IMO | International Maritime Organization |
| IRR | Internal Rate of Return |
| IW | Inland Waterway |
| IWMS | Inland Waterway Management Station |
| IWPA | Inland Waterway Port Authority |
| IWT | Inland Waterway Transport |
| IZ | Industrial Zone |
| JBIC | Japan Bank for International Cooperation |
| JETRO | Japan External Trade Organization |
| JICA | Japan International Cooperation Agency |
| JP¥ | Japanese Yen |
| JPC | Japan Port Consultants, Ltd. |
| LAD | Least Available Depth of waterway |
| LAW | Least Available Width of waterway |
| LCL | Less than Container Load |
| LOA | Length Overall |
| LSD | National Land Survey Datum |
| LWL95% | 95% Occurrence Water Level |
| MARD | Ministry of Agriculture and Rural Development |
| MIS | Management Information System |
| MOC | Ministry of Construction |
| MOSTE | Ministry of Science, Technology and Environment |
| MOT | Ministry of Transport |
| MPI | Ministry of Planning and Investment |
| MWL | Mean Water Level |
| N3 | Confluence/Bifurcation |
| NFEA | Northern Focal Economic Area |
| MT | Metric Ton |
| NPV | Net Present Value |
| NOWATRANCO | Northern Waterway Transport Corporation |
| OCDI | Overseas Coastal Area Development Institute of Japan |
| O-D | Origin and Destination |
| ODA | Official Development Assistance |
| PAX | Passenger |
| PC | People's Committee |
| P/L | Profit/Loss |
| PMU | Project Management Unit |
| PMU-Waterways | Project Management Unit of Waterways |

| | |
|------------|--|
| Q | Water Discharge |
| QGC | Quay-side Gantry Crane |
| RO/RO | Roll-on Roll-off |
| RTG | Rubber-Tired Gantry |
| RRD | Red River Delta |
| SBSTI | Shipbuilding Science & Technology Institute under VINASHIN |
| SCF | Standard Conversion Factor |
| SDL | National Survey Datum |
| Sh | Hydraulic Section |
| SOC | Ship Operation Cost |
| SOE | State-owned Enterprise |
| SPM | Suspended Particulate Matter |
| SRV | Sea-cum-river Vessel |
| SS | Suspended Solid |
| S/W | Scope of Work |
| SWR | Shadow Wage Rate |
| TDSI | Transport Development Strategy Institute under MOT |
| TEDI | Transport Engineering Design Incorporation |
| TEDI-Port | Port & Waterway Engineering Consultants under TEDI |
| TEDI-Wecco | Waterway Engineering Consultants under TEDI |
| TEU | Twenty-foot Equivalent Unit |
| US\$ | US Dollar |
| VAT | Value Added Tax |
| VCCI | Vietnam Chamber of Commerce and Industry |
| VICT | Vietnam International Container Terminals |
| VINALINES | Vietnam National Shipping Lines |
| VINAMARINE | Vietnam National Maritime Bureau |
| VINASHIN | Vietnam Shipbuilding Industry Corporation |
| VINAWACO | Vietnam Waterway Construction Corporation |
| VITRANSS | Vietnam Transport Strategy Study |
| VIWA | Vietnam Inland Waterway Administration |
| VMRCC | Vietnam Maritime Regional Coordination Center |
| VMS | Vietnam Maritime Safety Agency |
| VN | Vietnam |
| VND | Vietnam Dong |
| VOC | Vehicle Operation Cost |
| VR | Vietnam Railway |
| VR | Vietnam Register |
| VRA | Vietnam Road Administration |
| VTMS | Vessel Traffic Management System |

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PART IV

**SHORT-TERM DEVELOPMENT PLAN FOR IWT SYSTEM
IN HANOI SEGMENT FOR 2010**

Chapter 32 Transport Demand for 2010

32.1 River section traffic volume

Traffic volume on river sections especially concerned to the Hanoi segment was obtained after traffic assignment calculation. The assigned results of selected river sections are show in **Table 32.1**.

Table 32.1 Traffic Volume on the Selected River Sections (2010)

(Unit: Million Tons per Year)

| Stretch No. | Name of River | 2001 | 2010 | Rate of Increase |
|-------------|---------------|------|------|------------------|
| 16 | Red | 4.7 | 8.4 | 1.8 |
| 15 | Duong | 3.1 | 4.7 | 1.5 |
| 33 | Red | 3.1 | 4.8 | 1.6 |
| Confluence | Hanoi Segment | 10.9 | 17.9 | 1.6 |

Source) JICA Study Team

As shown in the above table, the projected traffic volume in Hanoi segment where these three rivers meet at their constitute a justification for the improvement of navigational safety and smooth navigation especially at a confluence of the Red and the Duong Rivers.

There are two major river ports along the Hanoi segment with several other ports specialized for construction materials. This projected traffic volume may constitute a justification for the expansion of the cargo handling capacity of such ports along the Hanoi segment as well. The projection of cargo throughput at Hanoi is discussed in the subsequent paragraph.

32.2 Transport demand in Hanoi

The transport demand in Hanoi segment was projected based on the foregoing studies and analysis of inland water transport demand by respective inland-waterway transport mode i.e. conventional IWT and SRV.

Table 32.2 Summarizes the inland waterway transport demand in Hanoi.

Table 32.2 Summary of Transport Demand in Hanoi up to 2010

(Unit: '000 tons per year)

| Item | 2001 | 2010 | AAGR%(01-10) |
|-----------------------|-------|--------|--------------|
| Construction material | 3,772 | 6,574 | 6.4 |
| Cement | 1,177 | 1,769 | 4.6 |
| Coal | 500 | 698 | 3.8 |
| Others | 546 | 739 | 3.4 |
| Container | 0 | 433 | 6.5 |
| Sub-total by IWT | 5,995 | 10,213 | 5.2 |
| Paddy | 0 | 373 | 5.1 |
| Steel | 0 | 1 | 14.7 |
| Fertilizer | 0 | 56 | 12.6 |
| Others | 0 | 110 | 6.0 |
| Sub-total by SRV | 0 | 540 | 6.3 |
| Cargo Demand Total | 5,995 | 10,753 | |

Source) JICA Study Team

32.3 Projection of passenger demand (2010)

Based on the traffic demand analysis on the passenger that may choose the river navigation especially along the potential routes such as (1) Hanoi - Hung Yen (60 km), Hung Yen - Thai Binh (41 km) and Hanoi - Thai Binh (101 km) to the south and (2) Hanoi - Vietri (75 km), Hanoi - Phu Tho (115 km) and Viet Tri - Phu Tho (40 km) to the west, total number of potential inland-waterway passenger is projected to be 641,000 in the year 2010.

Although there is no schedule inland waterway passenger transport service at present, the number of passengers that may choose an inland-waterway transport will increase substantially provided that necessary facilities to accommodate such demand i.e. passenger terminals, comfortable and relatively high-speed passenger boats, especially when the passenger intend to use this service not only for transporting him or herself but also some cargo associated with them.

32.4 Passenger demand for the river cruise

Table 32.4 below shows the tourist arrival and potential international and domestic visitors who may enjoy the river cruise in Hanoi.

Table 32.4 Projection of Tourist Arrivals and River Cruise Demand (2010)

(Unit: '000 tons per Year)

| Item | 2001 | 2010 | AAGR%(01-10) |
|-------------------------|-------|-------|--------------|
| Foreign Tourist Demand | 450 | 760 | 6.0 |
| Domestic Tourist Demand | 1,450 | 4,021 | 12.0 |
| Total Tourist Demand | 1,900 | 4,781 | 10.8 |
| Foreign Cruise Demand | 0 | 45 | 10.0 |
| Domestic Cruise Demand | 0 | 73 | 5.0 |
| Total Cruise Demand | 0 | 118 | 6.2 |

Source) JICA Study Team

Although these projection are of still a level of potentiality not a level of probability, there is a growing demand for the river cruise in Vietnam as it has been experiencing in Ho Chi Minh City as well as Hue City. As there are various potential tourism resources around and along the Red River especially in Hanoi segment, this projected demand may constitute a ground for the justification to develop the tourist passenger terminal and tourist river cruise system along the Hanoi segment.

Chapter 33 Future Vessel Size of IWT Fleet in Hanoi segment for 2010

33.1 Future vessel size

Possible future dimensions of waterways for 2010 can be assumed as **Table 33.1.1** taking into account present dimensions of waterways and the effort of VIWA for the development of inland waterways.

Table 33.1.1 Possible Future Dimensions of Waterways for 2010

| No | Corridor | LAD (m) | | LAW (m) | | Bend Radius (m) | |
|----|------------------------|---------|----------------|---------|----------------|--------------------|----------------|
| | | Present | Future 2010 | Present | Future 2010 | Present (<400m) | Future 2010 |
| 1 | Quang Ninh - Hai Phong | | | | | | |
| | Hai Phong - Hanoi | 1.5 | 2.0-2.5 | 30 | 30-50 | 10 bends | 200-400 |
| | Hanoi - Viet Tri | 1.5 | 2.0-2.5 | 30 | 30-50 | 0 bends | 700 |
| 2 | Quang Ninh - Hai Phong | | | | | | |
| | Hai Phong - Ninh Binh | 1.8 | 2.0-2.5 | 30 | 30-50 | 29 bends | 200-300 |
| 3 | Cua Day - Ninh Binh | 3.6 | 3.6 | 30 | 30-50 | 2 bends | 300-400 |
| 4A | Lach Giang - Hanoi | 2.0 | 2.0-2.5 | 30 | 30-50 | 2 bends | 300-400 |
| 4B | Cua Day - Hanoi | 2.0 | 2.0-2.5 | 30 | 30-50 | 2 bends | 300-400 |

Note) There may be some locations where it is difficult to realize future dimensions of waterway because of the site condition such as narrow width between dykes.

In the Hanoi segment, the following maximum vessel size for 2010 can be assumed taking into account the least dimensions of waterways for various vessels and possible future dimensions of waterways (see **Table 19.2.2** and **Table 33.1.1**)

Barge train: 2units@400DWT + Pushing Tug@135-200CV
(Length=95-102m, Breadth=9-10m, draft=1.5-1.6m, Speed=8-12km/h)

Barge train: 4units@200DWT + Pushing Tug@135-200CV
(Length=85-91m, Breadth=14-15m, draft=1.1-1.2m, Speed=8-12km/h)

Self-propelled vessel: 300DWT (400DWT - 600DWT of shallow draft type)
(Length=38-50m, Breadth=7-10m, draft=1.9-2.1m, Speed=14-20km/h)

33.2 Future fleet mix

As to the future fleet mix for the IWT in the RRD, the share of vessels of larger than

300DWT must be raised along with the increase of transport demand. On the other hand, smaller vessels of less than 100DWT, which are mainly deployed for family use or intra-provincial transport, are considered to drop their share for the future (see **Table 33.2.1**).

Table 33.2.1 Future Fleet Mix in Hanoi Segment (DWT share by size class)

| Year | <50DWT | 51-100DWT | 101-300DWT | >300DWT | Total |
|-------------------|--------|-----------|------------|---------|--------|
| Ave. Size in 2001 | 38 DWT | 76 DWT | 145 DWT | 411 DWT | 127DWT |
| 2001 | 3% | 24% | 47% | 26% | 100% |
| 2010 | 3% | 20% | 45% | 32% | 100% |
| 2020 | 2% | 15% | 43% | 40% | 100% |

Note) A barge train (e.g. Pusher + 4 barges) is counted as 1 vessel not 5 vessels.

Source) Data in 2001: based on passing vessels in sections nearby Hanoi (see Table 9.2.3)

Data in 2010 & 2020: JICA Study Team estimation