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

NO.

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)

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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

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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).

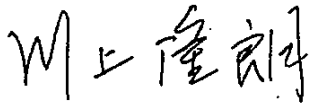
JICA dispatched a study team to Vietnam three times between December 2001 and January 2003, which was headed by Mr. Takechiho Tabata (December 2001 - June 2002) and Mr. Hisao Ouchi (June 2002 - January 2003) of the Overseas Coastal Area Development Institute of Japan (OCDI), and was comprised of OCDI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

大内 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