Japan Bank for International Cooperation

Impact Assessment of Transport Infrastructure Projects In Northern Vietnam

– Final Report –

July 2003

International Development Center of Japan

Preface

This report, "Impact Assessment of Transport Infrastructure Projects in Northern Vietnam" has been prepared by the Study Team entrusted by Japan Bank for International Cooperation (JBIC) in the fiscal year 2003.

This study intended to assess the impact of the two large-scale transport infrastructure projects supported by the Japanese ODA loan in the Northern Vietnam, from the viewpoints of contribution to the regional economic development and poverty reduction. The study examined the economic and social impacts of the projects with as much quantitative data as possible, by looking at the recent regional trend of foreign investment, the change in social environment and living standards of the local people, as well as the current situation of transport and distribution in the region.

We earnestly hope that this report will contribute to the recent discussion about the impact of large -scale infrastructure projects on economic growth and poverty reduction, by supplying a solid case study with quantitative data.

Taking this opportunity, we would like to express our sincere gratitude to all the officials of JBIC, Ministry of Planning and Investment, Ministry of Transport of the Socialist Republic of Vietnam, the Provincial Peoples Committees of Ha Noi, Hai Phong, Hai Duong and Hung Yen, as well as our local consulting partner, CONCETTI.

July 2003

Noriyoshi NAGAMATSU
Study Team Leader

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Currency Equivalents

Currency Unit = Vietnam Dong (VND)
US$ 1.00 = VND 15,337 (Dec, 2002)

ABBREVIATIONS

CPRGS	Comprehensive Poverty Reduction and Growth Strategy
DARD	Department of Agriculture and Rural Development
DPI	Department of Planning and Investment
DFID	Department for International Development (UK)
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GRP	Gross Regional Product
HCMC	Ho Chi Minh City
HD	Hai Duong
HH	Household
HN	Ha Noi
HP	Hai Phong
HY	Hung Yen
HW5	Highway No. 5
JBIC	Japan Bank of International Cooperation
JICA	Japan International Cooperation Agency
MARD	Ministry of Agriculture and Rural Development
MPI	Ministry of Planning and Investment
ODA	Official Development Assistance
PMU5	Project Management Unit No.5, Ministry of Transport
SOE	State Owned Enterprise
VND	Vietnam Dong

Executive Summary

The study aims to assess the socio-economic impact of two JBIC assisted projects in the transport sector, which are the improvement of National Highway No.5 and the expansion of Hai Phong Port. It was required to examine the role of such large-scale economic infrastructure in achieving economic growth and poverty reduction in the region concerned. The two JBIC assisted projects are among the first Yen loan projects with the resuming of Japanese ODA to Viet Nam. Both projects started in 1994 and completed in 2000. The Highway No. 5 connects the Gia Lam district of Ha Noi and Hai Phong Port which is the largest commercial port in northern Viet Nam. Apart from Highway No.5 and Hai Phong Port projects, JBIC financed other major highway improvement projects, including improvement of Highway No.18, No. 10, expansion of Cai Lan port and others (see Figure S1).

Figure S1: Location of the JBIC transport projects

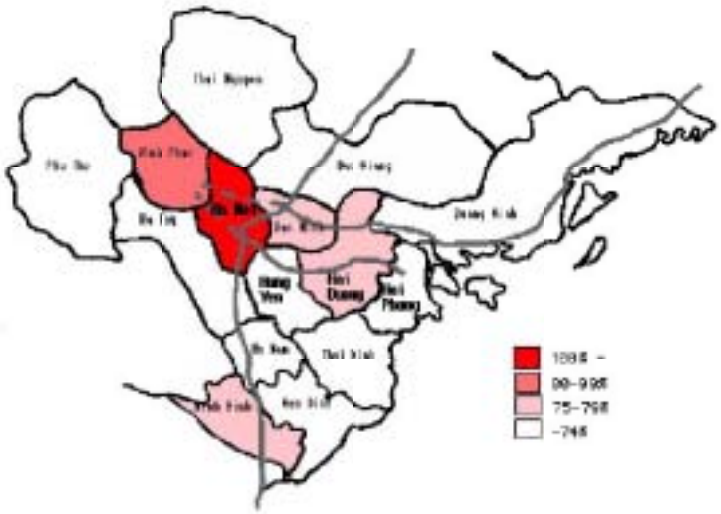
With regard to the impact on traffic, Highway No.5 and Hai Phong Port made a significant contribution to creating a transport corridor between Ha Noi and Hai Phong. This corridor is a strategic part of the road network in the Red River Delta. Before the project was implemented, the condition of Highway No.5 was not appropriate for heavy traffic. The road network in the region was not linked due to rivers without bridges. We now have a full-fledged transport corridor between Ha Noi and Hai Phong. The road network in the region became much improved. After the completion of the Hai Phong Port project, the port has a container-specialized port in Chua Ve. The total volume of cargo has increased 4 times over the last ten years.

Figure S2: Growth Rate of Per Capita GRP by Province, Annual average, 1995-2000

The two transport projects also made a significant impact on the growth of the regional economy. The study compared the GRP (gross regional product) growth rate of the provinces in northern Viet Nam between 1995 and 2000. The result shows that the provinces along the Ha Noi – Hai Phong transport corridor, such as Ha Noi, Hung Yen, Hai Duong and Hai Phong, had higher growth rate than the others (see Figure S2).

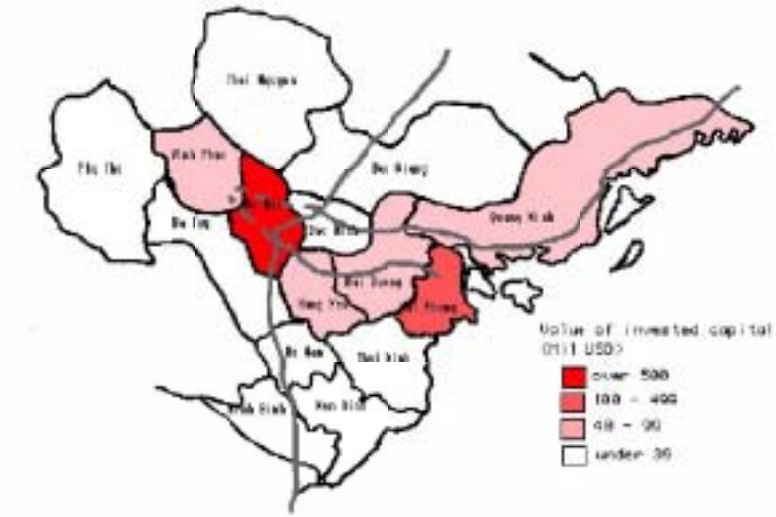
The poverty situation of these provinces have much improved as well. The rates of reduction of poor households in the northern provinces from 1998 to 2000 were compared, and it was shown that the provinces along Highway No.5 also achieved larger reduction of poor households than the others (see Figure S3). The reduction of poverty along the Ha Noi – Hai Phong corridor was significant.

Figure S3: Reduction in the Number of Poor HH from 1998 to 2000 (%)



This study examined these impacts of the two transport projects from two viewpoints, which are promotion of FDI and development of rural economy along the highway. From statistical data and survey results, the study considered how economic growth and poverty reduction had been achieved by the promotion of FDI and development of rural economy.

Figure S4: Total amount of foreign invested capital, 1999-2002



<u>Impact from FDI promotion</u> on economic growth and poverty reduction was examined from four perspectives, which are industrial growth, creation of factory employment, linkage with local industry and fiscal contribution. First of all, the study compared the total amount of foreign invested capital in the

northern provinces of Viet Nam from 1999 to 2002 (see Figure S4). It is shown that Ha Noi and Hai Phong remained the most popular destinations for foreign investors, and other attractive provinces were all located along the Ha Noi – Hai Phong transport corridor.

The study made an interview survey on over 70 managers of foreign enterprises in the northern Viet Nam. Majority of these foreign enterprises frequently use Highway No.5 and Hai Phong port for trading and traveling (see Table S1). Without the improvement of these transport infrastructures, it is estimated that 90% of these investment would not have been realized in this region. In this sense, Highway No.5 and Hai Phong Port were important preconditions for the FDI inflow.

Table S1: Use of Highway No.5 and Hai Phong Port for FDI in the northern Viet Nam

FDI Type	Productioin Site	Main Market	Export channel	Import channel	Use of HP port	Use of HW5	Business examples
1	Ha Noi		Hai Phong	Hai Phong	XX	XX	OA products
2	Ha Noi	Local	Hai Phong	Hai Phong	XX	XX	sanitary ware
3	Ha Noi	Local		Hai Phong	XX	X	glass ware
4	Ha Noi		Internet				software
5	Ha Noi		Noi Bai	Hai Phong	X	X	electronic parts
6	Hai Phong		Hai Phong	Hai Phong	XX		clothes, bags
7	Hai Phong	Local		Hai Phong	XX	X	glass container
8	Hai Phong	Local	Hai Phong	Hai Phong	XXX	XX	heavy metal structure
9	Hai Phong		Noi Bai	Noi Bai		XX	jewely
10	Vinh Phuc	Local		Hai Phong	X	X	motorbike

Note: X shows frequency of use.

The most significant contribution of FDI should be the economic growth in the region. This study assessed the impact of FDI inflow on economic growth, based on a quantitative analysis using the Cobb-Douglas production function. It was estimated that the existing FDI inflow in the four provinces along Highway No.5 increased the national GDP by 1.9% in 2001 in comparison with the GDP of the previous year. If we only look at the impact of the FDI inflow on the regional economy in the north, it was shown that the GRP in the Red River Delta increased by 9.1% in the same year. From the general statistical data, it was also shown that 15% of GRP and 37% of gross industrial output of the four provinces were generated by foreign enterprises in 2000.

FDI's impact on poverty reduction was, on the other hand, still limited. Foreign investment surely generates extremely valuable employment, but its impact is very small on the local economy. For instance, foreign enterprises in four major industrial zones in the north create around 14,000 jobs now. A similar number of workers are also employed in the provincial industrial zones along Highway No.5. However, the share of foreign enterprises in the total industrial labor forces in the four provinces was only 6% in 2000. Except a few fortunate workers, most of the local labor forces have nothing to do with foreign invested sector.

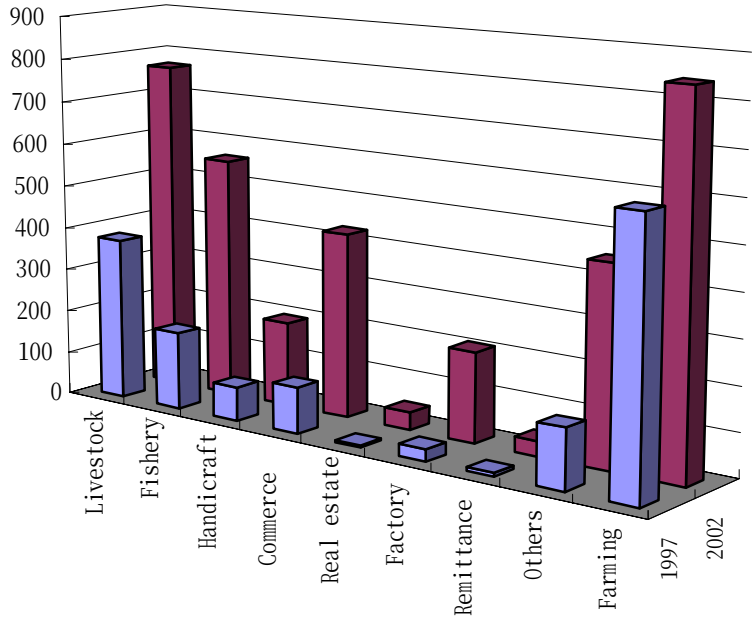
The business linkage of FDI with local economy is limited as well. Apart from food processing or natural resources based investment, most foreign enterprises made very little linkage with local economy, particularly with manufacturing sector. One of the possibilities to strengthen the linkage with local economy is the promotion of so-called "satellite investment" of foreign parts producers. Large manufacturing FDI projects, those of machinery or vehicles in particular, caused concurrent investment of many parts suppliers from industrialized countries. These related investments would gradually increase the local value of the whole production. This is widely observed in many industrial parks in neighboring ASEAN countries.

FDI's fiscal contribution is also inadequate. It was supposed that the local government would receive more and more tax payments from increasing number of foreign enterprises. So long as the government has a strong political commitment to poverty reduction, the bigger state tax revenues would result in more and more pro-poor investments in the country. Despite this expectation, the share of FDI in the state revenue of Ha Noi, Hai Phong, Hung Yen and Hai Duong combined was only 6% in 2000, excluding their

contribution to payments of customs duties. This share was similar to that of the whole country, which was 7% in the same year. This limited share could be explained by the fact that many of foreign enterprises were at the initial stage and did not generate much profit or still enjoyed tax holidays. Foreign enterprises, however, would make more and more fiscal contribution in the foreseeable future, and let the government allocate more budgets for pro-poor investment.

Impacts of rural development on economic growth and poverty reduction were examined from three points of view, i.e. expansion of new economic activities, diversification of household income and better access to social services. The study particularly focused on the rural economy of the two provinces on Highway No.5, which are Hung Yen and Hai Duong. In these two provinces, the rural household survey was implemented in March 2003. So as to see the impact on the rural economic activities, around 200 households were randomly selected from six communes, with the focus on their poverty levels.

Figure S5: Changes in structure of Income for the surveyed households* on average



Note: Data of 206 surveyed households, more than one answers

It was shown from this households survey that the rural economy underwent a significant structural transformation. Farming still has the biggest share in the average household income, but the income from livestock production, fisheries and trade increased significantly in the last five years (see Figure S5).

One important social aspect of Highway No.5 seems to be traffic accidents. Many of the surveyed households pointed out that the highway was dangerous or difficult to cross. However, due to the series of traffic safety campaigns by the public authorities, this problem seems to be under control now. Although Highway No. 5 had a higher growth rate of accidents, the highway area came to have less injuries and deaths in comparison with the national average level.

It is sure that the improvement of Highway No.5, Hai Phong port and related improvement of feeder roads to the highway played a significant role in promoting the rural development. However, the transport infrastructure projects did not cause this development from the scratch. Concurrent interventions are also of primary importance. The series of agriculture policies to promote the transformation of agricultural production from the late 1980s should be a notable example. Moreover, the household survey provided us with the clear evidence that the expansion of agricultural extension and agricultural credit services in the region have significantly promoted the transformation of the rural

economy. It seems that the rural households were well prepared to carry out their economic structural shift by the time when the two transport projects were completed. In this sense, the improvements of Highway No.5 and Hai Phong port were regarded as important triggers to accelerate rural economic development.

1. Introduction

1.1 Background of the Study

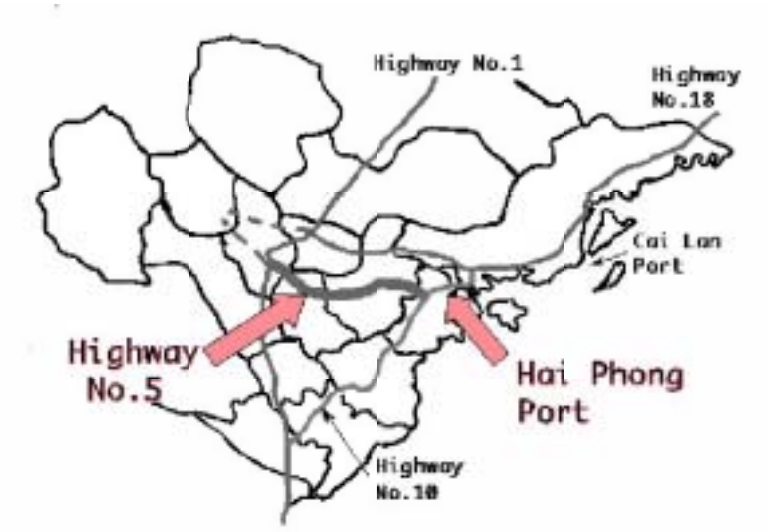
1.1.1 Study Objective

The Yen Loans to Vietnam resumed in November 1992. Since then, the rehabilitation and the expansion of infrastructures such as transportation and electricity sectors have been continuously prioritized in Japan's assistance to Vietnam. It has been nearly ten years since the resumption of Yen Loans to Vietnam and some of projects in transportation sector completed, put in use and began indicating positive impact on the Vietnamese economy.

Notably, the improvement project of Highway No.5 connecting capital city Hanoi and Hai Phong Port, the most important seaport in northern Vietnam, was completed in June 2000, and the expansion project of Hai Phong Port was also finished in November 2000 and has been put into operation. Since the completion of those projects, traffic volumes on the improved road sections and cargoes handled at the upgraded port have substantially increased, and the domestic and foreign investments in construction and operations of factories along Highway No.5 have also accelerated tremendously.

JBIC has assisted other transportation projects in northern Vietnam such as the rehabilitation of bridges on Highway No.1, the improvement of Highway No.18 including the construction of Bai Chay Bridge, the improvement of Highway No.10, the expansion of Cai Lan Port, the expansion of Hai Phong Port (Phase II), and the construction of Binh Bridge in Hai Phong (see Figure 1.1.1.1). Within a few years' time, further positive economic impact of above-mentioned transportation projects can be expected.

Figure 1.1.1.1: Location of the JBIC transportation projects



Note: Bridge construction projects are not included in this map.

According to JBIC, for the resumption of Japan's ODA loans to Viet Nam, the Japanese Government and the Vietnamese Government have had intensive discussions on how to achieve economic development. From the experience of neighboring countries, FDI attraction is among key criteria for projects selection. The two projects were selected under these criteria.

Since the Vietnamese Government prepared the final version of the Comprehensive Poverty Reduction and Growth Strategy (CPRGS) in May 2002 to which many donors including JBIC have actively participated, the poverty reduction and the policy assistance for further promotion of market economic systems have become the focal issues in Vietnam. At the same time, measures for better coordination of assistance to Vietnam have been taken by donor communities in line with the implementation of partnerships on various development issues. The Japanese Government has also re-examined its ten years' results and effects of assistance, analyzing the recent economic situation in Vietnam, and reviewing its country assistance strategies to Vietnam although the rehabilitation and expansion of infrastructures can be considered as development activities consistent with and complementary to the development of

social sectors and poverty reduction.

Taking into account of those situations, the current study is going to review the effects of two completed projects, the improvement of Highway No.5 and the expansion of Hai Phong Port, to learn from past experience of Japan's assistance to Vietnam and to make recommendations to JBIC's policies for future project implementation. The Study aims to assess the economic, socio-economic, transportation and regional impacts brought by two completed projects in the transportation sector, particularly taking into account of the quantitative assessment of their growth impacts and effects on the reduction of poverty in Northern Vietnam.

1.1.2 Possible Impacts of Large-Scale Transport Infrastructure in the Coming Future

While provision of large-scale and local transport infrastructures is still on-going, and positive results can been seen from investments, development of systems and institutions in other related sectors, particularly the agriculture and rural sector, industrial sector, trade and financial services in the region, the following aspects cannot be neglected, though firm evidence could not been provided at this stage of development.

Consideration of the short period of full use after the completion of works:
One of the specific features of the current study is that the period of full use of both Highway No.5 and Hai Phong Port after their completion of engineering works is rather short. The display of positive and negative impacts brought by the projects under assessment will be fully shown in coming years. Additional impacts may also accrue after the completion of other roads and bridges expansion and rehabilitation projects which are presently under construction. The assessment of various impacts requires careful consideration of those features of projects.

Assessment of impacts that affect regional development patterns in Vietnam:
The center of industrial and commercial activities in Vietnam has traditionally concentrated in the south of Vietnam, particularly in and around Ho Chi Minh City. The area is still the most important hub of those activities in Vietnam. However, the projects under assessment have dispersed the concentration of industrial and commercial activities in southern Vietnam to the north, which may bring about more balanced and better regional patterns of economic activities in Vietnam. The impact assessment of impacts by the projects may require the consideration of effects on the regional development patterns in Vietnam.

Assessment of impacts in the international context:
The Southeast Asian countries are now developing rapidly. The southern provinces of neighboring China centering on Hong Kong and Kwangtung are now developing into a world center of electric and electronic industries. Thailand, also in the Indochina peninsula, is another center of major economic activities in the region. The economic development of Hanoi-Hai Phong axis may be combined with economic activities of Chinese provinces of Yunnan and Guangxi in the near future, further linking with two regions of southern China and Thailand together with southern Vietnam around Ho Chi Minh City. The assessment of impacts by the projects may be considered in the international context of surrounding regions.

1.2 Review of Government Policy Documents and Related Studies

1.2.1 Strategy and Plan for Socio-Economic Development

Since Vietnam has declared its commitment to implement the Millennium Development Goals and poverty reduction objectives that were agreed upon in the National Summit in September 2000, poverty reduction became the major development goal in the process of Vietnam's socio-economic development. The Ninth National Party Congress endorsed "**Strategy for Socio-Economic Development 2001-2010**", one of five specific goals of the Strategy is to eliminate the category of hungry households, and reduce quickly the number of poor households. More in detail, the Strategy refers to hunger eradication and poverty alleviation as follows:

> "By mobilizing resources from the State and the whole society to increase investments in building infrastructures, providing loans, financing vocational training, supplying information, transferring technology and helping market products, etc. for poor areas, communes and population groups….By 2010 there will fundamentally be no longer poor households."[1]

The Strategy's goal for hunger eradication and poverty alleviation was integrated in "**The 5-Year Plan for Socio-Economic Development 2001-2005**", which was prepared in 0ctober 2001 and approved at the Ninth Party Congress. In the Plan, the effective implementation of hunger elimination and poverty reduction program was pursued, and the target of eliminating hungry households was set at 10% of poor households by 2005. Poverty reduction is recognized as the basic element to ensure the sustainable growth and, in turn, sustainable growth could provide opportunities for the poor to get out of the vicious cycle of poverty. Poverty reduction is regarded as the integral part of the 5-Year Development Plan.

1.2.2 The Comprehensive Poverty Reduction and Growth Strategy

In order to realize the poverty reduction as is envisaged in the 10-Year Development Strategy and the 5-Year Development Plan, the Government of Vietnam has prepared the **Comprehensive Poverty Reduction and Growth Strategy (CPRGS)** which is Vietnamese PRSP and was approved by the Prime Minister in May 2002. The Poverty Working Group/Poverty Task Force (PWG/PTF) have collaborated with the Government of Vietnam for the preparation of CPRGS. The PWG/PTF continue to work together with Vietnam's Government to implement, monitor and evaluate the CPRGS. The Government has translated the overall policy framework of CPRGS into a three-year action plan, with annual benchmarks towards achievement of the CPRGS's goals, and in the process of developing regional poverty reduction and growth strategies.

In order to strengthen the capacity of the Government to implement the entire process of CPRGS, donors are also smoothening their coordination in supporting the Government . The World Bank, DANIDA and UNDP have provided technical assistance in the CPRGS implementation through secretariat work for the next two years. The FAO plans to support the Ministry of Agriculture and Rural Development (MARD) in implementing the agricultural component of CPRGS.

While donors are still increasing their aid programs to support the implementation of CPRGS, some donors pointed out in the CG Meeting held in Hanoi in December 2002 that CPRGS did not specifically refer to the role of infrastructure. The CG Meeting agreed to consider linkages between large-scale infrastructure, growth and poverty reduction. In fact, CPRGS recognizes the linkage between growth and poverty reduction:

> "Economic growth must go hand in hand with social progress and equity and environmental protection in order to create more jobs for our growing labor force, …eliminate hunger, reduce poverty, and reduce social problems effectively and in time. Economic growth will generate resources for poverty reduction…."[2]

However, the poverty reduction targets focus on the small and local infrastructures and seem to neglect the role of large-scale infrastructures. The CPRGS ensures the provision of essential infrastructure

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[1] Strategy for Socio-Economic Development 2001-2010, Government of Vietnam

[2] CPRGS, p.6

facilities for poor people, poor communities and poor communes:

> "Continue reforming, upgrading and expanding the existing essential infrastructure facilities and develop new ones (small irrigation schemes, schools, commune health clinics, rural roads, electricity for lighting purposes, clean water for livelihood purposes, markets, commune cultural and postal offices, meeting rooms, etc.) to ensure that 80% of poor communes are provided with adequate essential infrastructure by 2005 and 100% by 2010."[3]

The preference of small-scale infrastructures to large-scale infrastructures seems to be logical, since the precedent study "**Pro-Poor Infrastructure Provision**" prepared by the Infrastructure Sub-Group formed within the PTF as an input for the implementation of CPRGS refers only or mainly to the small-scale infrastructures as the poverty-focused infrastructures, and almost entirely ignored the impacts on poverty reduction by large-scale infrastructures.

There are many examples of contribution of large-scale infrastructures to growth through reducing transaction costs, facilitating trade flows, enabling economic players to respond to new types of demand in different places, lowering the costs of inputs, opening up new opportunities for entrepreneurs, creating and providing employment, etc.[4] But there are few previous studies indicating the impacts of infrastructure on pro-poor growth . The DFID's recent contribution of "**Making Connection: Infrastructure for Poverty Reduction**" is the one on this line.

The DFID Paper focuses on the multidimensional nature of poverty, and recognizes that the infrastructure services play an important role in promoting economic growth and reducing vulnerability of the poor. On the contrary to the general understanding that the infrastructure investments is of little relevance to poverty reduction, it considers the significance of the link between the provision of infrastructure services and poverty elimination. Such understanding is due to a variety of barriers, such as distorted public investment choices, neglect of maintenance, etc., that have hindered the contribution to growth and prevented poor people from access to economic opportunities. The degree of efficiency in the organization of infrastructure investment and maintenance has had a major effect on pro-poor outcomes.

The DFID Paper also points out that national (large-scale) infrastructure effects poor people's livelihood quite directly. The development and maintenance of infrastructure at the local level alone are unlikely to transform an economy. Since infrastructure constitutes a network, potential benefit from the infrastructure development and maintenance will be maximized by simultaneous improvement at local and national levels. Poverty reduction can also be realized by the growth of non-farm employment, which is heavily dependent on the availability of infrastructure services.

Our study on the assessment of the economic, socio-economic, transportation and regional impacts brought by the two completed projects in the transportation sector, i.e. the improvement of Highway No.5 (HW 5) and the expansion of Hai Phong Port, has a similar view on the role of infrastructure development and its importance of simultaneous improvement at local and national levels. The study aims to provide concrete evidence in line with this understanding. Although at the planning stage the projects did not address the impact on poverty reduction, the results of our study seem to have exemplified that they have brought a number of positive outcomes of growth and also effects on poverty reduction in the region.

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[3] op.cit., p.38

[4] Making Connections: Infrastructure for Poverty Reduction, DFID, August 2002, p.6

1.3 Outline of Projects Reviewed

1.3.1 HW 5 Rehabilitation

The Highway No.5 is a 2-lane trunk road of approximately 100 km, connecting national capital Hanoi (population: 3.1 million in1991) and the country's gateway port city Hai Phong (population: 1.4 million in 1991). The highway has been used as a trunk road for transportation of export and import goods, raw materials and products produced, processed and consumed in Northern Vietnam. In this sense, the highway is the most important road in the North of Vietnam to maintain the economic and social activities in the North, so its improvement seems to be a fundamental factor for the attraction of foreign and domestic investments in the region. Without the improvement, industrial zones could not be established in the region that attract so many investors, and the region would remain undeveloped compared to the Southern region such as HCMC**.**

The HW 5 was deteriorated by the heavy traffic and insufficient maintenance. As it had functioned as the most important artery in Northern Vietnam, further increase in traffic was forecasted, and urgent rehabilitation was needed.

The total length of the project road is 106km from Hanoi to Hai Phong, of which 91km road section (from km 0 to km 47, and from km 62 to km 106) was carried out under the OECF loans, while the construction of remaining 15km section was undertaken by Taiwanese Loans. The project components included the construction of 4-lane road (partly 6 lanes), construction of new road bridges, and engineering works.

Table 1.3.1.1: Outline of the Projects: highway No.5

	Km 0-47	Km 62-93	Km 93-106	Total (91km)
Loan agreement	VNI-4	VNII-4	VNIII-4	
Lender	OECF	OECF	OECF	
Date of signing	1994.1.28	1995.4.18	1996.5.29	
Amount (Mil. yen)	8,782	5,470	6,709	20,961
Interest rate (%)	1.00	1.90	2.30	
Pay back (y) (grace)	30(10)	30(10)	30(10)	
Implementation	MOT, Project Management Unit	MOT, Project Management Unit	MOT, Project Management Unit	
Consultant	Katahira Engineering Int'l/DCIL-TIPHIA CO	Katahira Engineering Int'l/DCIL-TIPHIA CO	Katahira Engineering Int'l/DCIL-TIPHIA CO	
Contractor	Taisei/Rotec	Fujita/NECCO/CIENCO1	SUMITOMO/CIENCO8	
Completion	1999.1	1999.1	2000.6	

Source: JBIC

1.3.2 Hai Phong Port Rehabilitation

Hai Phong Port has been a main gateway port in Northern Vietnam with a large hinterland covering most of the northern provinces of Vietnam as well as part of southwestern provinces of China. Before the American War, the Port handled more than 60% of the country's sea-borne cargo, but the throughput in 1992 sank to 2.4million tons, giving its position of the main gateway of the country to Saigon Port in the South. Nevertheless, Hai Phong Port is still one of the three international ports in Vietnam and the only major port in the Red River Delta serving the country's capital Hanoi.

As a river port, the Port suffers from a huge amount of silt in the navigation channels, allowing only smaller ships to call in, leading to the decrease in the Port's throughput. The Port has not well prepared for the age of containerization. Although the Berth No.1 of the Main Port was the first container terminal with initial operation in 1990, the container handling equipment was very poor and the measures to cope with growing container demand were urgently required.

The original scope of the project consisted of the rehabilitation of navigation channels of the Hai Phong Port, terminal rehabilitation at the Main Port and Chua Ve Port. However, it was later revised to concentrate on the construction of fully specialized container facilities in Chua Ve area, but the channel dredging work and the improvements at the main Port area were dropped. Therefore, the purpose of the project is to secure fundamental infrastructure for transportation in Northern Vietnam in order to cope with the increase in large-sized ships' visits and containerization.

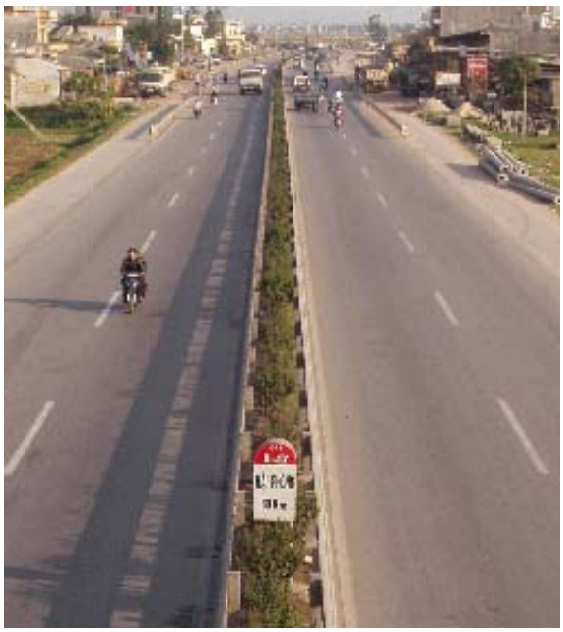
Table 1.3.2.1: Outline of the Projects: Hai Phong Port

Loan agreement	
Lender	OECF
Date of signing	1994.1
Amount (Mil. yen)	3,975
Interest rate	1.00
Pay back (y)(grace)	30(10)
Implementation	Vietnam National Maritime Bureau
Consultant	n.a
Contractor	n.a
Completion	2000.11

Source:JBIC

2. Assessment of the Impact

2. 1 Impact on Transport Economy



Highway No.5 from Ha Noi to Hai Phong

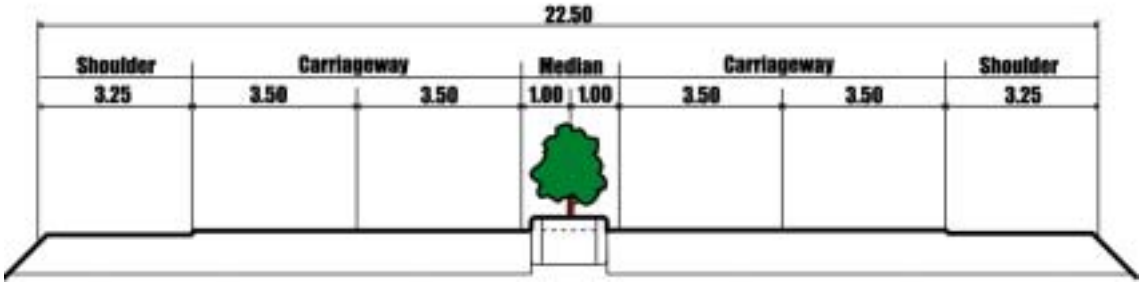
2.1.1 Current Conditions

2.1.1.1 Changes in Transport Network

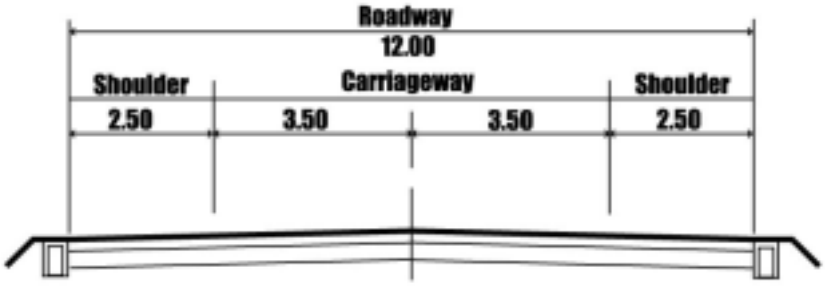
- The road network in the Red River Delta before (year 1993) and after (year 2003) improvement of Highway No. 5 is shown in Figure 2.1.1.2.
- The road network before improvement was comprised of narrow and deteriorated Highway No. 5, Highway No.10 and No.18 that were unlinked due to many rivers without bridges, and flooded feeder roads in the rainy season. Therefore, the roads in the Red River Delta were not in good condition to function as road network.
- After the year 2000, the improvement of road network was accelerated, such as the widening and paving of Highway No. 5, creating a strategic transport corridor between Ha Noi and Hai Phong, the improvement of Highway No. 10 and No.18, and feeder roads improvement which is illustrated in Figure 2.1.1.3, together with JBIC and the local government.
- This shows the start of formulation of a functional road network in the Red River Delta.
- Typical cross sections of improved Highway No.5 and others roads are shown below.

Figure 2.1.1.1: Typical Cross Sections of Improved Highway No. 5 and other Roads

(Highway No.5)



(Highway No.10)



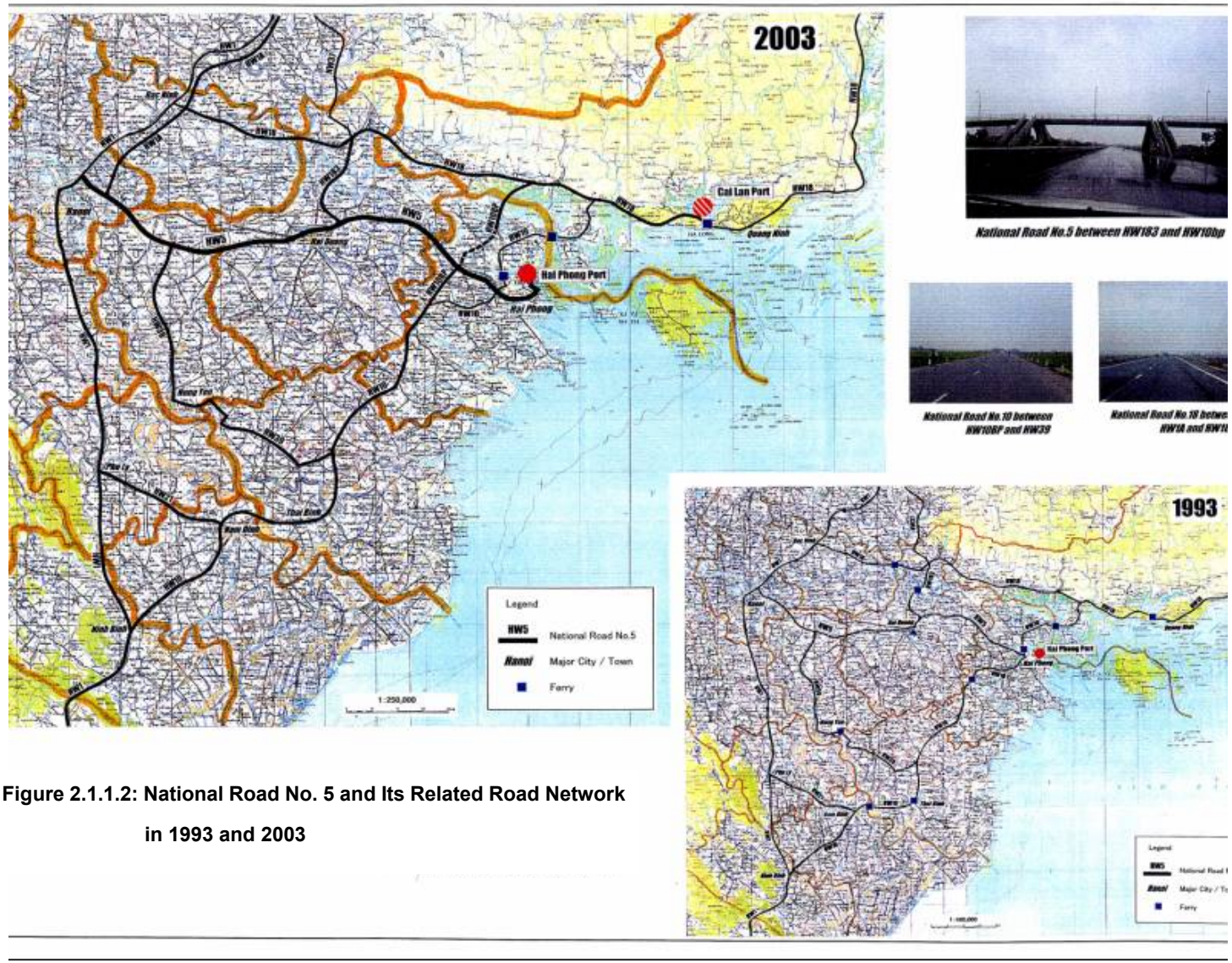
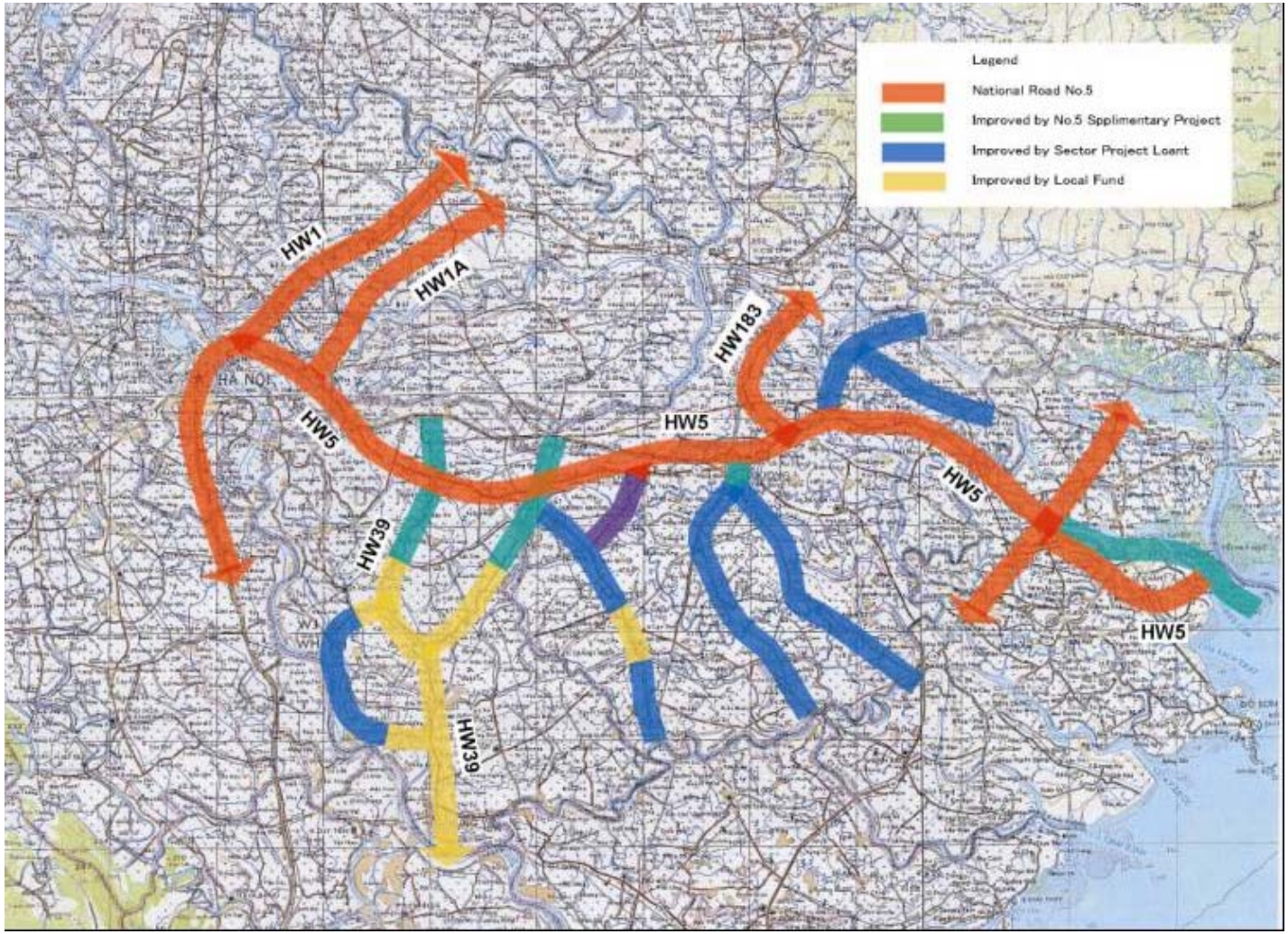


Figure 2.1.1.2: National Road No. 5 and Its Related Road Network in 1993 and 2003

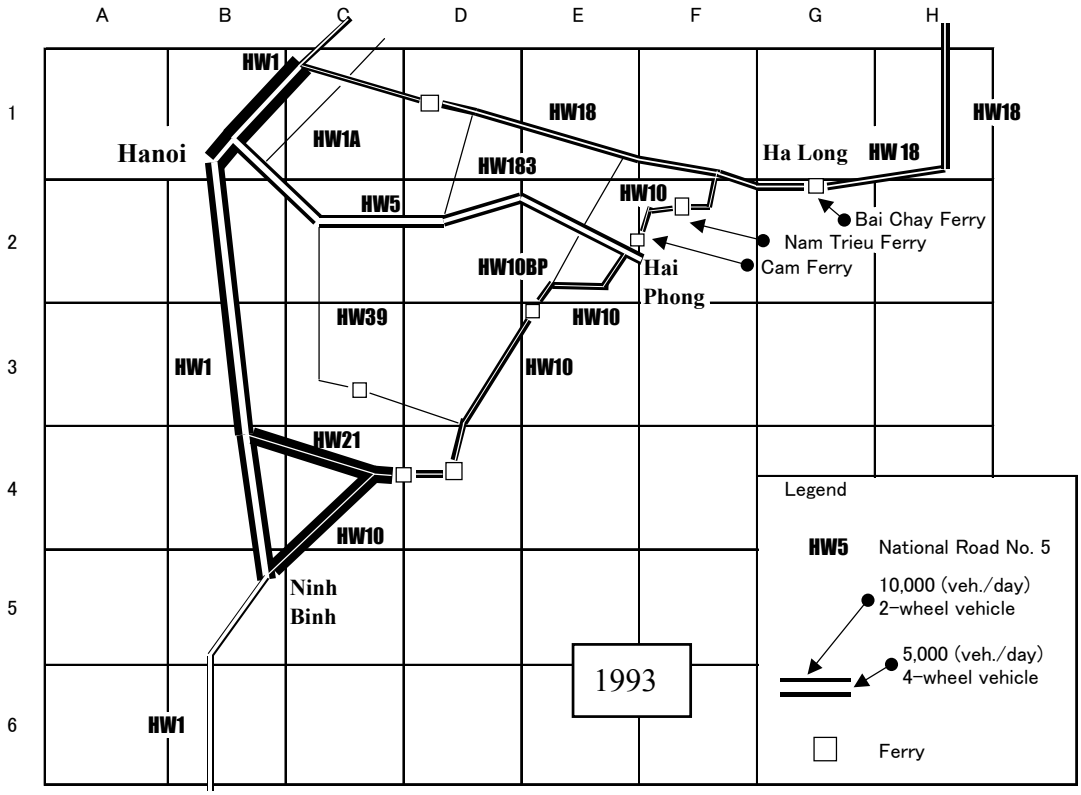
Figure 2.1.1.3: Current Development Conditions of National Road No.5 and Its Connected Feeder Roads



2.1.1.2 Changes in Traffic Volume

- Traffic volume in the road network before (year 1993) and after (year 2003) improvement of Highway No. 5 is shown in Figure 2.1.1.4,and Tables 2.1.1.1, 2.1.1.2 and 2.1.1.3.
- Traffic volume between 'before improvement' and 'after improvement' drastically changes.
- The highest traffic volume of 61,772 pcu/14 hours can be seen along Highway No. 5 near Highway No.1, suburban area in Ha Noi. The highest motorcycle traffic can also be seen in the same road.
- Traffic volume along Highway No.5 ranges from 9,200 to 62,000 pcu/14 hours.
- Traffic volume 'after improvement' along Highway No. 5 is almost 2 to 10 times higher than 'before improvement'. Especially, the increase in motorcycle traffic is significant.
- Traffic volume along the other related Highways is from 4,000 to 10,000 pcu/14 hours.
- Table 2.1.1.4 shows the trend of Highway No. 5 traffic by section from 1993, 1999 to 2003. Most of the sections of Highway No. 5 were completed in 1999. The growth rate between 1999 and 2003 is more drastic than those between 1993 and 1999.
- Traffic volume from 1993 and 2003 almost doubles due not only to population and vehicle increase but also to active land use development along Highway No. 5.

Figure 2.1.1.4: Traffic Volume in 1993 and 2003 in the Study Area



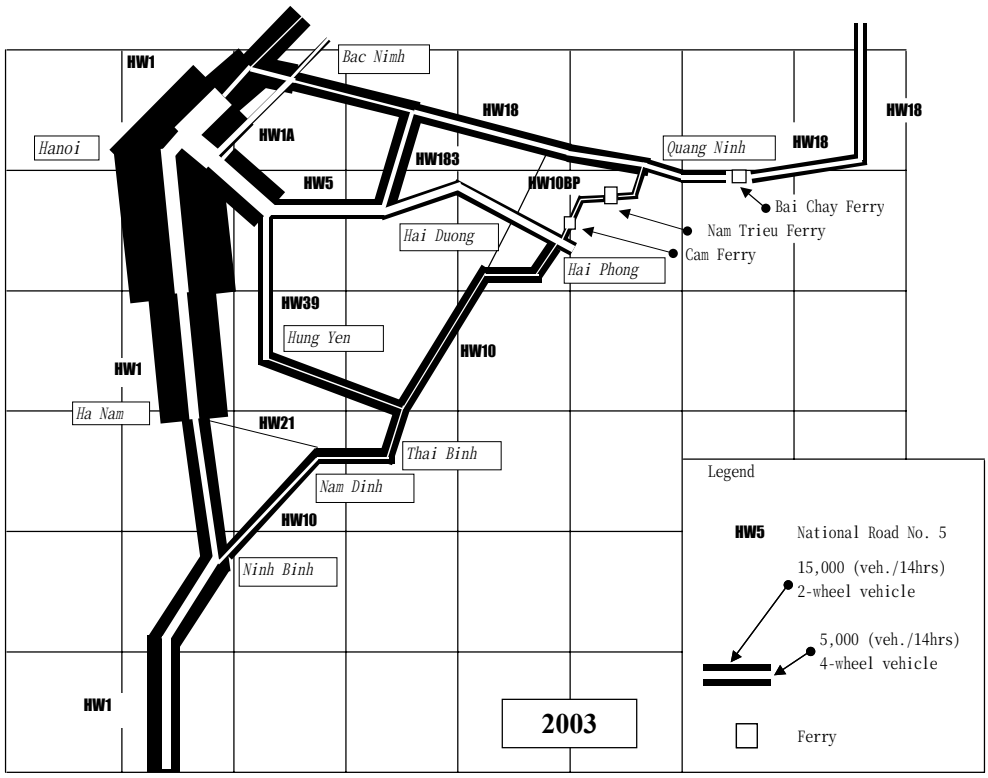


Table 2.1.1.1: Traffic Volume by Road in 1993

Name of Road	Section		Length (km)	Road Width (m)	No. of Lane	Vehicle/24 hours									PCU Total (Excl .2-W)	PCU Total (Excl. Bicy)	Capacity (PCU/24h)	V-C Ratio
						Bicycle	Motor-Cycle (0.3	Car (1.0)	Bus (2.0)	Truck (2.0)	Large Truck (2.5	2-wheel Total	4-wheel Total	Grand Total				
HW 1	Bac Giang	- HW 18			2	1,352	937	563	102	340	86	2,289	1,091	3,380	1,662	1,943	6,000	0.32
	HW 18	- HW 5			4	5,706	7,899	1,232	200	1,073	157	13,605	2,662	16,267	4,171	6,540	40,000	0.16
	HW 5	- HW 21			4	6,300	3,815	1,114	646	1,555	291	10,115	3,606	13,721	6,244	7,388	40,000	0.18
	HW 21	- HW 10			4	6,300	3,815	1,114	646	1,555	291	10,115	3,606	13,721	6,244	7,388	40,000	0.18
	HW 10	- Thanh Hoa			2	1,288	981	500	348	743	183	2,269	1,774	4,043	3,140	3,434	6,000	0.57
HW 5	HW 1	- HW 39			2	2,299	4,380	1,424	281	1,078	228	6,679	3,011	9,690	4,712	6,026	6,000	1.00
	Hw 39	- HW 10			2	3,785	2,265	951	145	1,043	241	6,050	2,380	8,430	3,930	4,609	6,000	0.77
HW 10	HW 1	- HW 21			2	6,661	2,340	213	92	415	11	9,001	731	9,732	1,255	1,957	6,000	0.33
	HW 21	- HW 39			2	17,574	4,618	333	105	583	21	22,192	1,042	23,234	1,762	3,147	6,000	0.52
	HW 39	- HW 5			2	2,459	1,240	84	87	302	8	3,699	481	4,180	882	1,254	6,000	0.21
	HW 5	- HW 18			2	1,453	1,198	248	72	84	6	2,651	410	3,061	575	934	6,000	0.16
HW 18	HW 1	- HW 183			2	1,959	1,311	119	25	222	54	3,270	420	3,690	748	1,141	6,000	0.19
	HW 183	- HW 10			2	2,300	1,993	265	122	605	80	4,293	1,072	5,365	1,919	2,517	6,000	0.42

Source: Master Plan on Transportation Development in the Northern Part of the Socialist Republic of Viet Nam, JICA October, 1993

Table 2.1.1.2: Traffic Volume by Road in 1999

Traffic Volume by Road in 1999

No.	Kilopost	Location	Length (km)	Road Width (m)	No. of Lane	Vehicle/14 hours									PCU Total (Excl .2-W)	PCU Total (Excl. Bicy)	Capacity (PCU/24h)	V-C Ratio
						Bicycle	Motor-Cycle (0.3	Car (1.0)	Bus (2.0)	Truck (2.0)	Large Truck (2.5	2-wheel Total	4-wheel Total	Grand Total				
HW 5	HW 1	- HW 1A		30.0	6	9,943	19,054	2,784	1,564	3,425	390	28,997	8,163	37,160	13,737	19,453	60,000	0.32
	HW 1A	- HW 39		22.5	4	3,571	7,502	2,244	1,226	1,603	485	11,073	5,558	16,631	9,115	11,365	40,000	0.28
	HW 39	- HW 183		22.5	4	2,617	3,569	1,436	793	952	717	6,186	3,898	10,084	6,719	7,789	40,000	0.19
	Hw 183	- HW 10		22.5	4	1,468	3,050	1,138	503	1,121	379	4,518	3,141	7,659	5,334	6,249	40,000	0.16

Table 2.1.1.3: Traffic Volume by Road in 2003

Name of Road	Section		Length (km)	Road Width (m)	No. of Lane	Vehicle/14 hours									PCU Total (Excl .2-W)	PCU Total (Excl. Bicy)	Capacity (PCU/24h)	V-C Ratio
						Bicycle	Motor-cycle (0.3)	Car (1.0)	Bus (2.0)	Truck (2.0)	Large Truck (2.5	2-wheel Total	4-wheel Total	Grand Total				
HW 1	Bac Giang	- HW 18			2	9,994	10,113	359	295	344	349	20,107	1,347	21,454	2,510	5,543	10,000	0.55
	HW 18	- HW 5			6	8,265	42,455	3,641	2,584	2,325	1,846	50,720	10,396	61,116	18,074	30,811	60,000	0.51
	HW 5	- HW 10			6	8,942	39,095	2,336	1,879	1,702	1,809	48,037	7,726	55,763	14,021	25,749	60,000	0.43
	HW 10	- Thanh Hoa			4	7,810	15,232	1,892	1,464	991	1,728	23,042	6,075	29,117	11,122	15,692	40,000	0.39
HW 1A	Bac Giang	- HW 18			2	607	4,240	923	905	502	504	4,847	2,834	7,681	4,997	6,269	10,000	0.63
	HW 18	- HW 5			2	1,300	3,929	1,650	1,015	737	729	5,229	4,131	9,360	6,977	8,155	10,000	0.82
HW 5	HW 1	- HW 1A		30.0	6	5,305	40,839	4,860	3,359	2,479	2,548	46,144	13,246	59,390	22,906	35,158	60,000	0.59
	HW 1A	- HW 39		22.5	4	5,141	14,022	3,138	2,665	1,779	2,501	19,163	10,083	29,246	18,279	22,485	40,000	0.56
	HW 39	- HW 183		22.5	4	3,758	10,020	2,605	2,032	1,362	2,309	13,778	8,308	22,086	15,166	18,172	40,000	0.45
	Hw 183	- HW 10		22.5	4	2,743	7,343	1,016	791	669	1,228	10,086	3,704	13,790	7,006	9,209	40,000	0.23
HW 10	HW 1	- HW 21		12.0	2	3,520	6,721	501	421	513	746	10,241	2,181	12,422	4,234	6,250	10,000	0.63
	HW 21	- HW 39		12.0	2	5,811	5,970	407	440	479	432	11,781	1,758	13,539	3,325	5,116	10,000	0.51
	HW 39	- HW 5		12.0	2	5,149	6,431	287	303	477	331	11,580	1,398	12,978	2,675	4,604	10,000	0.46
	HW 5	- HW 18			2	2,764	2,652	347	387	187	223	5,416	1,144	6,560	2,053	2,848	10,000	0.28
HW 10 BP	HW 10	- HW 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HW 5	- HW 18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HW 18	HW 1	- HW 1A		12.0	4	5,597	15,631	865	776	541	839	21,228	3,021	24,249	5,597	10,286	40,000	0.26
	HW 1A	- HW 183		12.0	2	7,397	7,029	837	621	443	685	14,426	2,586	17,012	4,678	6,786	10,000	0.68
	HW 183	- HW 10		12.0	2	6,619	7,132	1,010	1,109	433	628	13,751	3,180	16,931	5,664	7,804	10,000	0.78
	HW 10	- Bai Chay Ferry		12.0	2	3,982	5,376	1,130	1,386	505	466	9,358	3,487	12,845	6,077	7,690	10,000	0.77
	Bai Chay Ferry	- Ha Long	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HW 39	HW 5	- Hung Yen		12.0	2	3,260	7,600	1,117	1,075	1,006	980	10,860	4,178	15,038	7,729	10,009	10,000	1.00
	Hung Yen	- HW 10		12.0	2	5,849	6,514	222	377	462	234	12,363	1,295	13,658	2,485	4,439	10,000	0.44
HW 183	HW 5	- HW 18		12.0	2	7,933	8,167	845	711	729	795	16,100	3,080	19,180	5,713	8,163	10,000	0.82

Table 2.1.1.4: Trend of Highway No. 5 Traffic

A. Survey Results

Year	Items	Section			Remarks
		HW1 - HW39	HW39 - HW183	HW183 - Hai Phong	
1993	① Grand Total	9,690	9,060	8,430	Source:
(24h)	② 4-wheel Total	3,011	2,696	2,380	The Master Plan Study on the Transport Development in the Northern Part in the SRVN, JICA, June 1994
	③ 2-wheel Total	6,679	6,365	6,050	
	④ PCU (Excl. 2wheel)	4,712	4,321	3,930	
	⑤ PCU (Excl. Bicycle)	6,026	5,316	4,609	
1999	① Grand Total	19,831	10,084	7,058	Source:
(14h)	② 4-wheel Total	5,569	3,808	3,141	SAPS for National Highway No. 5 Improvement Project in the SRVN, OECF, 1999
	③ 2-wheel Total	11,073	6,106	4,518	
	④ PCU (Excl. 2wheel)	9,116	6,719	5,334	
	⑤ PCU (Excl. Bicycle)	11,365	7,709	6,249	
2003	① Grand Total	29,246	22,086	13,790	Source:
(14h)	② 4-wheel Total	10,083	8,309	3,704	Impact Assessment of Transport Infrastructure Projects in Northern Vietnam, JBIC, March 2003
	③ 2-wheel Total	19,163	13,778	10,086	
	④ PCU (Excl. 2wheel)	18,279	16,166	7,006	
	⑤ PCU (Excl. Bicycle)	22,485	18,172	9,208	

B. Converted to 24-hour Traffic

Year	Items	Section			Remarks
		HW1 - HW39	HW39 - HW183	HW183 - Hai Phong	
1993	① Grand Total	9,690	9,060	8,430	
	② 4-wheel Total	3,011	2,696	2,380	
	③ 2-wheel Total	6,679	6,365	6,050	
	④ PCU (Excl. 2wheel)	4,712	4,321	3,930	
	⑤ PCU (Excl. Bicycle)	6,026	5,316	4,609	
1999	① Grand Total	19,957	12,101	9,191	
	② 4-wheel Total	6,670	4,578	3,768	
	③ 2-wheel Total	13,288	7,423	5,422	
	④ PCU (Excl. 2wheel)	10,998	8,063	6,401	
	⑤ PCU (Excl. Bicycle)	13,638	9,347	7,499	
2003	① Grand Total	35,095	26,503	16,548	
	② 4-wheel Total	12,100	9,970	4,445	
	③ 2-wheel Total	22,996	16,534	12,103	
	④ PCU (Excl. 2wheel)	21,935	18,199	8,407	
	⑤ PCU (Excl. Bicycle)	26,982	21,806	11,051	

C. Increase Rate between Years

	Items	Section			Remarks
		HW1 - HW39	HW39 - HW183	HW183 - Hai Phong	
1999/1993	① Grand Total	2.06	1.34	1.09	
	② 4-wheel Total	2.22	1.74	1.58	
	③ 2-wheel Total	1.99	1.17	0.90	
	④ PCU (Excl. 2wheel)	2.32	1.87	1.63	
	⑤ PCU (Excl. Bicycle)	2.26	1.76	1.63	
2003/1999	① Grand Total	1.76	2.19	1.80	
	② 4-wheel Total	1.81	2.13	1.18	
	③ 2-wheel Total	1.73	2.23	2.23	
	④ PCU (Excl. 2wheel)	2.01	2.26	1.31	
	⑤ PCU (Excl. Bicycle)	1.98	2.33	1.47	
2003/1993	① Grand Total	3.62	2.93	1.96	
	② 4-wheel Total	4.02	3.70	1.87	
	③ 2-wheel Total	3.44	2.60	2.00	
	④ PCU (Excl. 2wheel)	4.66	4.21	2.14	
	⑤ PCU (Excl. Bicycle)	4.48	4.10	2.40	

2.1.1.3 Changes in Travel Speed

The travel speed of vehicles reaches over 60 km/hour along not only improved Highway No. 5 but also other related roads. This cuts almost by half the travel time between Ha Noi and Hai Phong compared with 3.5 to 4 hours (25 to 28 km/hour) before the highway improvement.

Table 2.1.1.5: Travel Speed along Highway No. 5 and No. 183

Feb. 12 2003

Time		Min.		Dif.	Place	Km	Speed (km/hr)
8 : 22		502			HW 1 Starting Point		
8 : 29		509			HW 5 Starting Point		
8 : 35		515		6	HW 5/HW 1A	6.0	60.0
8 : 39	8 : 50	519	530	4	10.4 km	4.4	66.0
8 : 53	9 : 06	533	546	3	12.0 km	1.6	32.0
9 : 16		556		10	HW 5/HW 39 23.1 km	11.1	66.6
9 : 26		566		10	HW 5/HW 38 33.5 km	10.4	62.4
9 : 37		577		11	49.0 km	15.5	84.5
9 : 43	9 : 48	583	588	6	53.0 km	4.0	40.0
9 : 51	10 : 07	591	607	3	Phu Long Bridge 56.0 km	3.0	60.0
10 : 37		637		30	88.0 km	32.0	64.0
HN to HP				83		88.0	**63.6**
12 : 38		758			Toll Gate at Old HW 5 88.0 km		
12 : 39	12 : 49	759	769	1	HW 5/HW 10 BP 86.0 km	1.0	60.0
12 : 50		770		1	Nomura Hai Phong 85.0 km	1.0	60.0
13 : 14		794		24	HW 5/HW 183 59.7 km	25.3	63.3
13 : 35		815		21	HW 183/HW 18 22.0 km	22.0	*62.9*
13 : 58		838		23	HW 5/HW 183 59.7 km	22.0	*57.4*
13 : 59		839		1	Toll Gate 59 km	0.7	42.0
14 : 05		845		6	55.0 km	4.0	40.0
16 : 33		993			48.0 km		
16 : 49		1009		16	HW 5/HW 39	24.9	93.4
17 : 18		1038		29	HW 5 Starting Point	23.1	47.8
HP to HN				78		80.0	**61.5**
Both way				161		168.0	**62.6**

2.1.1.4 Local Public Transport Network

The objective of the analysis of the existing public transport system in the study area is how to improve and activate the bus transport by the improvement of Highway No.5, considering that the bus is the main mode of transport for the low-income families. Analysis is undertaken using the available bus transport data, such as bus route structures and frequencies in Hai Duong and Hung Yen provinces.

Public transport system in Hung Yen province is mainly served by buses. The inter-provincial buses operate to/from the bus terminal located in the provincial center. In 2002, the number of passengers and passengers-km reached 1,790 thousand and 12,000 thousand, respectively. The annual growth rates of number of passengers and passengers-km are 7% and 9%, respectively. This sharp increase is due to better convenience of bus system by the improvement of Highway No. 5 and its related roads. The bus route structure to/from Hung Yen is shown in Figure 2.1.1.5.

The unauthorized feeder bus system using minibuses, which has 12 – 15 passenger capacity, is also operated in the province primarily along feeder roads. This is mainly managed by small enterprises such as family businesses. These feeder buses are very popular among the people living along the bus routes such as farmers because of cheap fares and flexible getting on/off along the bus routes. The improvement of this feeder bus system is greatly attributed to the improvement of feeder roads followed by trunk roads improvement such as Highway No. 5.
On the other hand, there are 33 bus routes to/from Hai Duong. Out of this total, nine routes connect the adjacent provinces and the remaining routes connect further provinces with distance more than 300 km. There are four bus terminals in Hai Duong Province. The bus routes are served by the companies registered in Hai Duong as shown in Figure 2.1.1.6. The number of buses for public use by ownership and the impact of Highway No.5 improvement on public transport businesses are summarized in Tables 2.1.1.6 and 2.1.1.7, respectively.

Figure 2.1.1.5: Intercity Bus Route Structure to/from Hung Yen

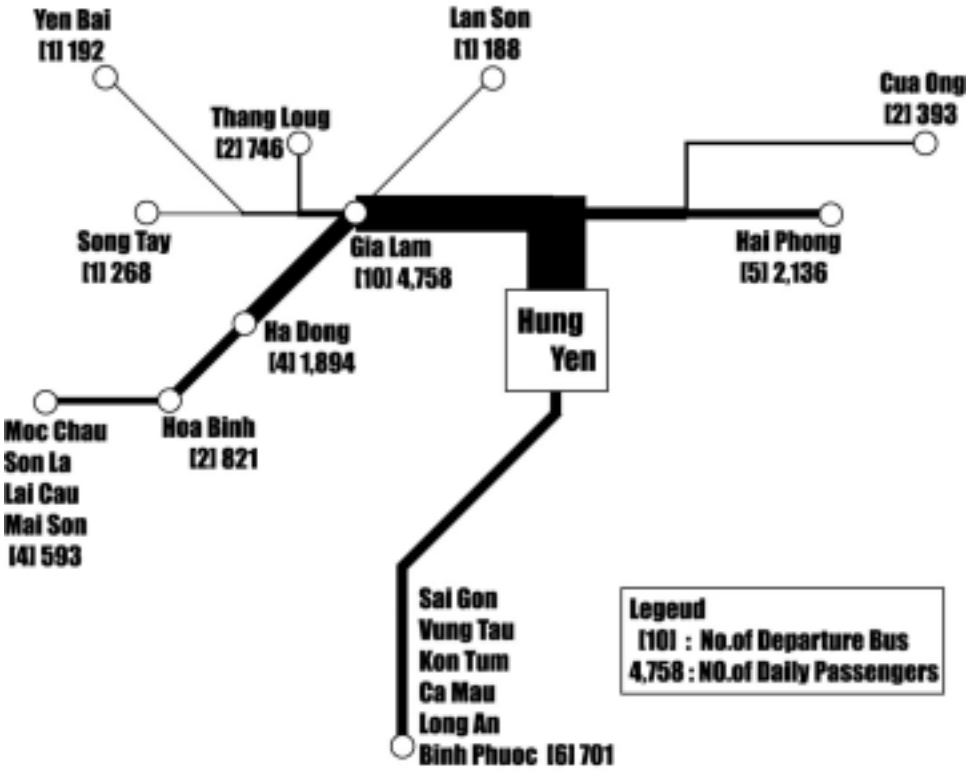


Figure 2.1.1.6: Bus Routed Structure in Hai Duong (Only Adjoining Provinces)

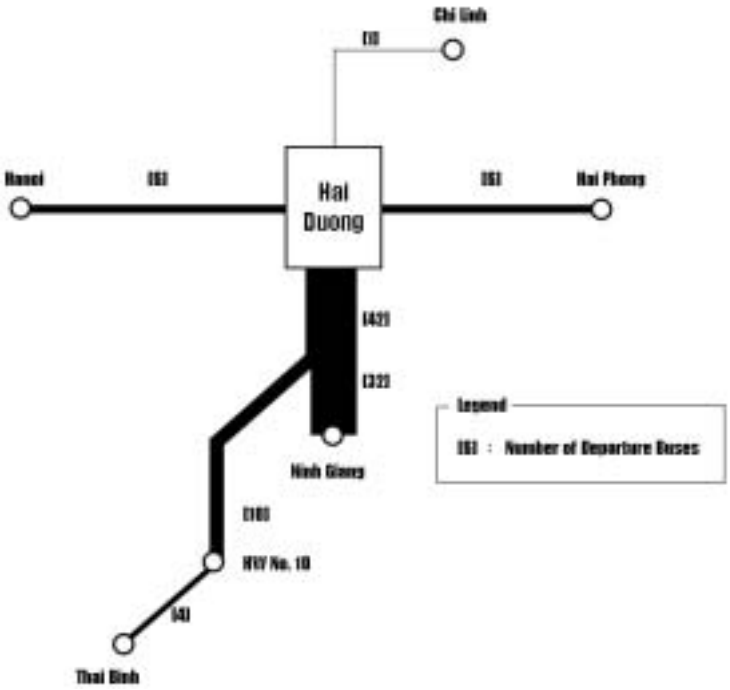


Table 2.1.1.6: Number of buses for public use by ownership in Hai Duong

Ownership	Number of buses in 2003
Hai Duong Joint Stock Transport Co.	87
Private Enterprise	28
Cooperative	13
Total	128

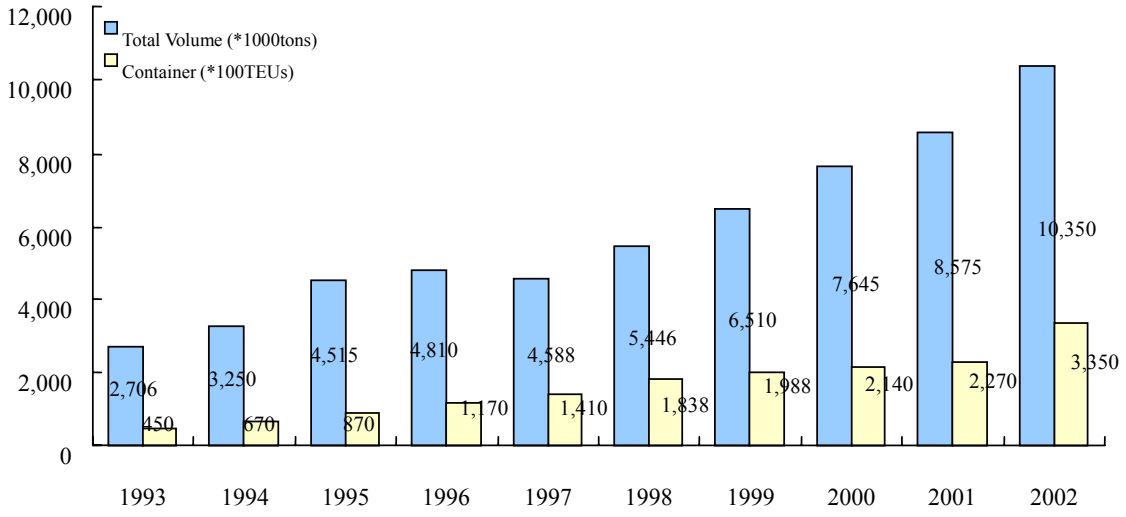
Table 2.1.1.7: Impact of Highway No.5 Improvement for Public Transport Business

Items	Number of Buses	Number of Seats	Annual Passengers
Before 1996 (Including Hung Yen)	50	2,500	1,200,000
In 2003 (Excluding Hung Yen)	240	8,561	1,800,000

2.1.1.5 Changes in Traffic to/from Hai Phong Port

- Trend of cargo throughput in Hai Phong Port is shown in Figure 2.1.1.7. Total volume of cargo and container in 2002 are 10.35 million tons and 33.5 thousand TEUs, respectively. The growth rate of container volume between in 2001 and 2002 is 1.48. This is attributed to the rehabilitation of Chua Ve container port.
- Figures 2.1.1.8 to 2.1.1.14 are the traffic count and truck driver's interview survey results.
- 70% out of total traffic use the Main port and 38% of the total are container trucks.
- 42% and 31% of total traffic have the destinations of Hai Phong and Ha Noi, respectively.
- 64.5% out of total traffic use only Highway No. 5 for the traveling route.
- 47% out of total container trucks are 40 feet.
- 32% out of total freight is farm produce such as rice and maize.

Figure 2.1.1.7: Cargo Throughput Statistics in Hai Phong Port (1993– 2002)



■ Cargo Throughput Statistics in Hai Phong Port (1993 - 2002)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total Volume (*1000tons)	2,706	3,250	4,515	4,810	4,588	5,446	6,510	7,645	8,575	10,350
Container (*100TEUs)	450	670	870	1,170	1,410	1,838	1,988	2,140	2,270	3,350

Source: Project Completion Report (Hai Phong Port Rehabilitation),
April 2002, PMU and Brochure of Hai Phong Port in 2003, Hai Phong Port Authority

Figure 2.1.1.8: Percentage of Vehicle Traffic Volume between Main Port and Chua Ve Port

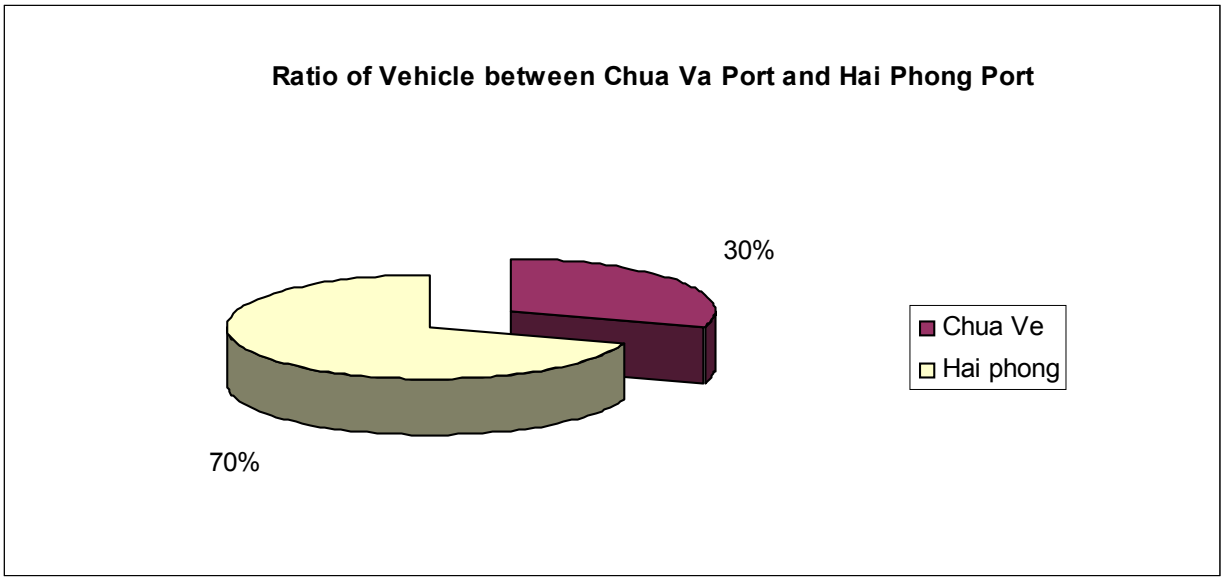


Figure 2.1.1.9: Type of Vehicle

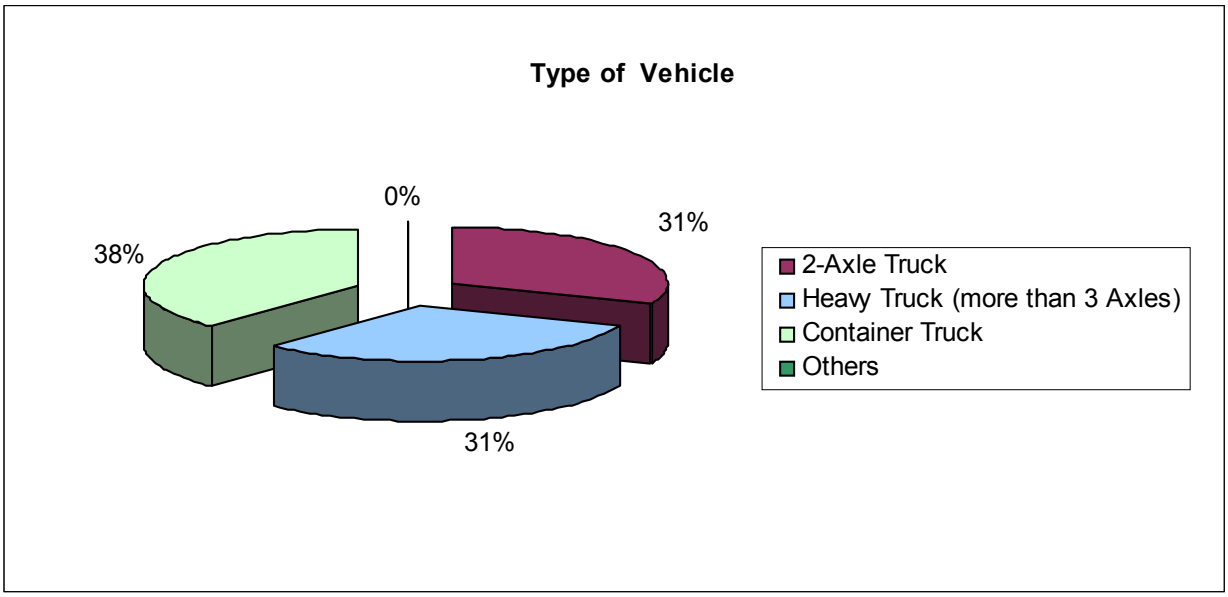


Figure 2.1.1.10: Origin of Vehicle

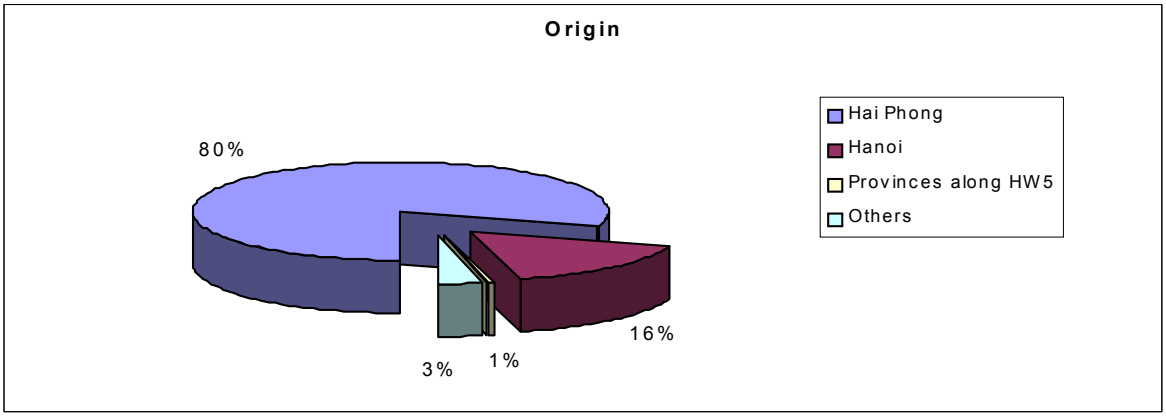


Figure 2.1.1.11: Destination of Vehicle

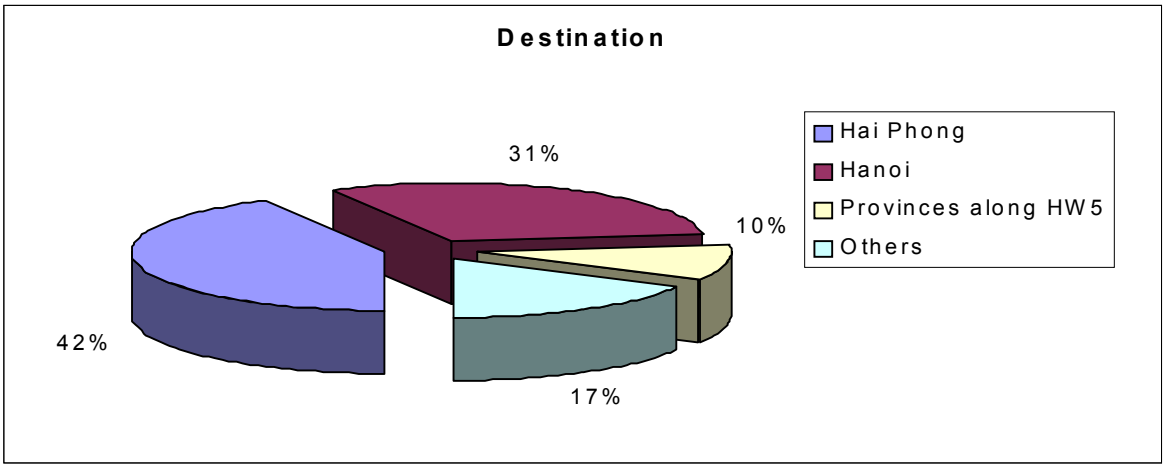


Figure 2.1.1.12: Access//Egress Route of Vehicle

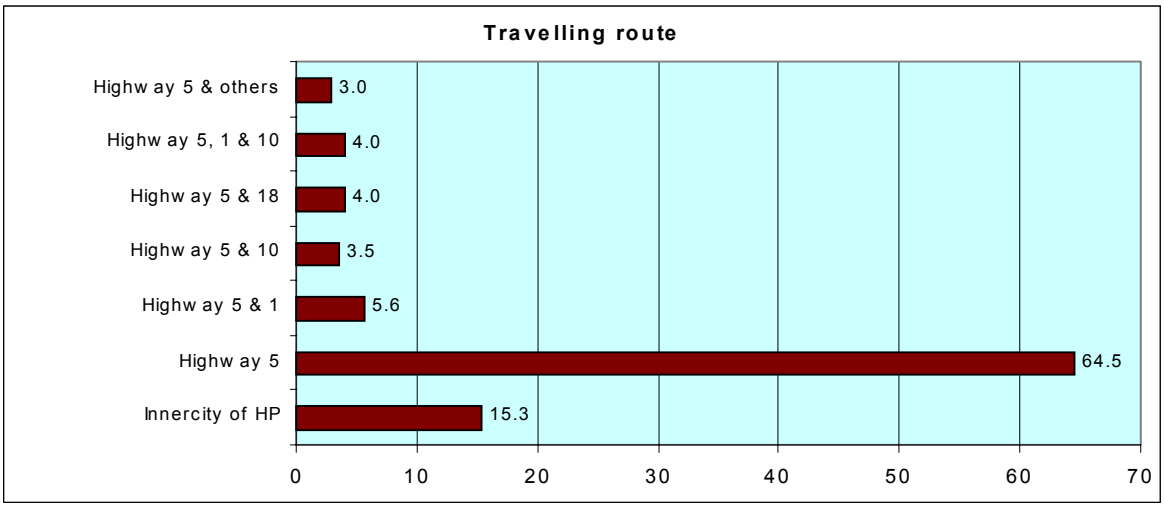


Figure 2.1.1.13: Container Size

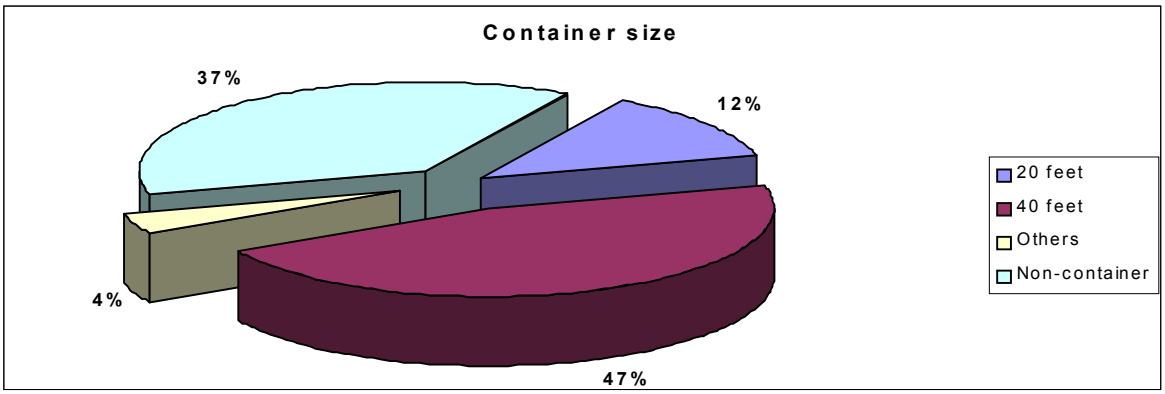
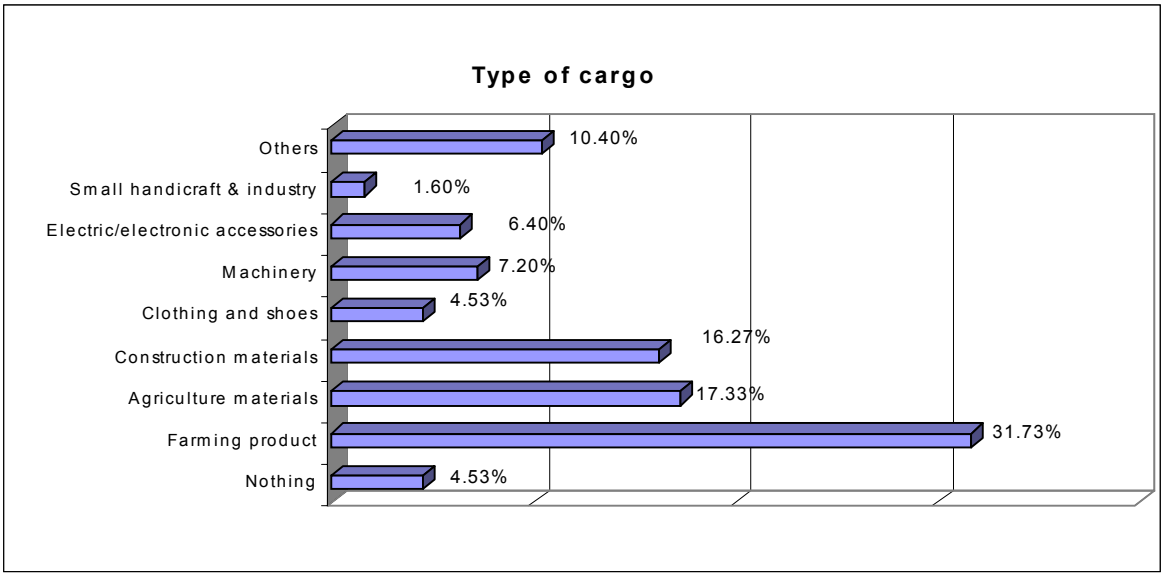


Figure 2.1.1.14: Major Commodities to/from Hai Phong Port



2.1.1.6 Land Use

1) Change of land use before and after the improvement of Highway No.5

- The improvement of Highway No. 5 resulted in not only increasing the traffic volume between Hanoi and Hai Phong but also drastically changing the land use along the corridor. To assess the change of land use along Highway No. 5, a comparison analysis is made as follows, based on the aerial photos in 1993 and 2003, taken by PMU5.
- Selected areas of this study are Pho Noi in Hung Yen province and the provincial center in Hai Duong along Highway No. 5. A location map of these two areas, and aerial photos taken of Hung Yen and Hai Duong are shown in Figures 2.1.1.15, 2.1.1.16 and 2.1.1.17, respectively.

Hung Yen Province (along Highway No. 5 at intersection with Highway No. 39)

- This area is one of the most strategic transport points in Hung Yen province. There is high accessibility of this point not only to/from Hanoi and Hai Phong but also to/from the provincial centers in Hung Yen and Thai Binh. Therefore, after the completion of improvement of Highway No. 5 and No. 39, industrial development became even more active. Especially Hung Yen province provides the industrial zones in the neighboring area at this intersection, notably, Pho Noi A and B industrial zones.
- Total number and area of industrial zones under provincial management in Hung Yen are 5 and 908 ha, respectively. Four (4) industrial zones and 846 ha out of the total concentrate along Highway No. 5.

Hai Duong Province (bypass of Hai Duong provincial center)

- Highway No. 5 formulates the northern edge of the urbanized area in Hai Duong as the bypass after improvement.
- Active industrial development can be seen alongside Highway No. 5. However, not only industrial development but also various types of development can be seen along Highway No. 5, because this area is close to the urbanized area where there are various kinds of urban services available.
- There is a factory of Ford Motor Company, a water treatment facility donated by JICA, a restaurant/hotel/shopping center complex.
- Ford Motor is looking for highly skilled workers from the urbanized area, and target customers of restaurant/hotel/shopping center complex at km 50 of Highway No. 5 are mainly tourists of Ha Long Bay who stop and buy popular souvenirs in this province on the way back after improvement of Highway No. 5. This complex functions as gateway to the provincial center as well. The water treatment facility also serves the people living in the provincial center.

Figure 2.1.1.15 Location Map of the Aerial Photos taken in 1993 and in 2003

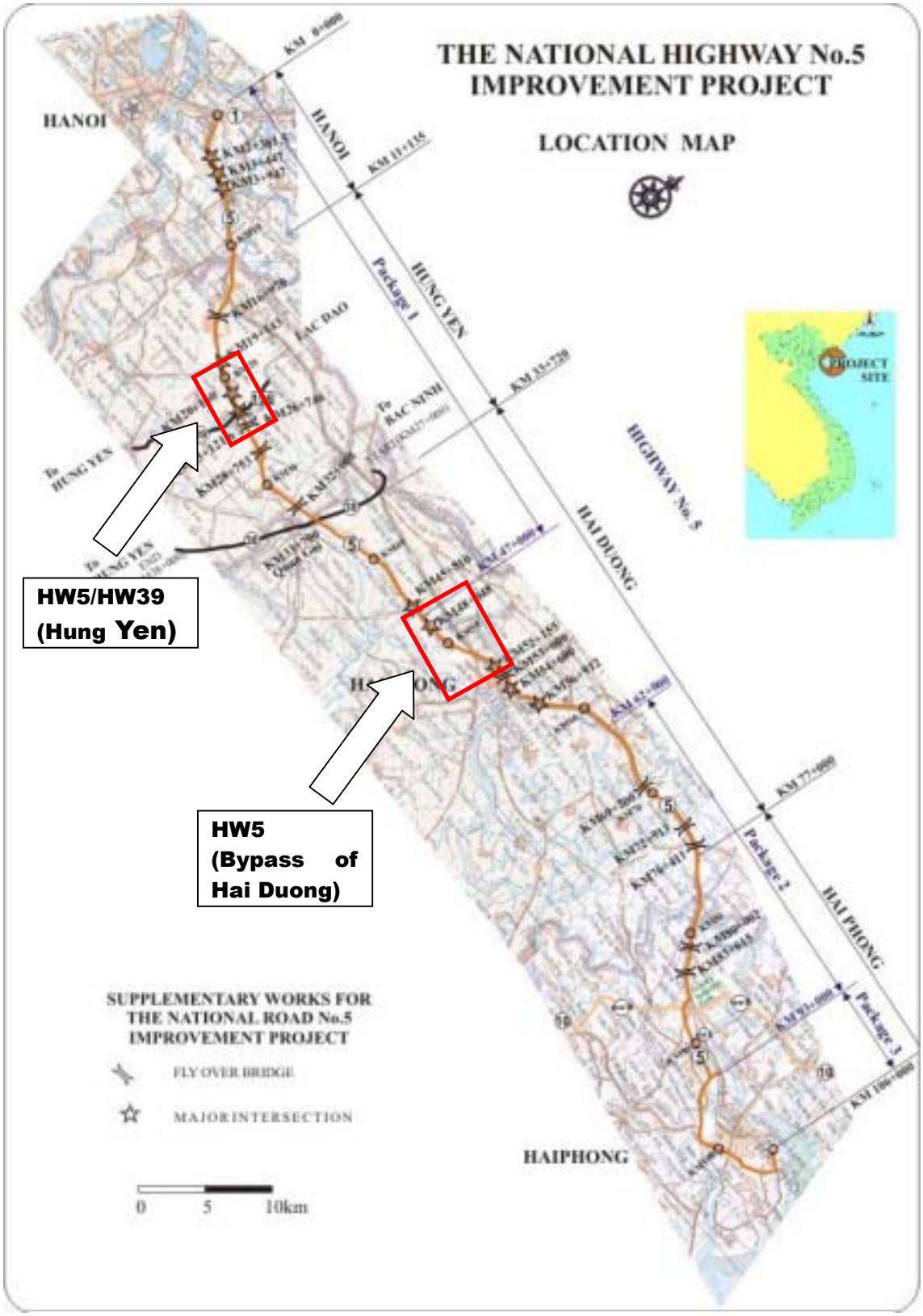
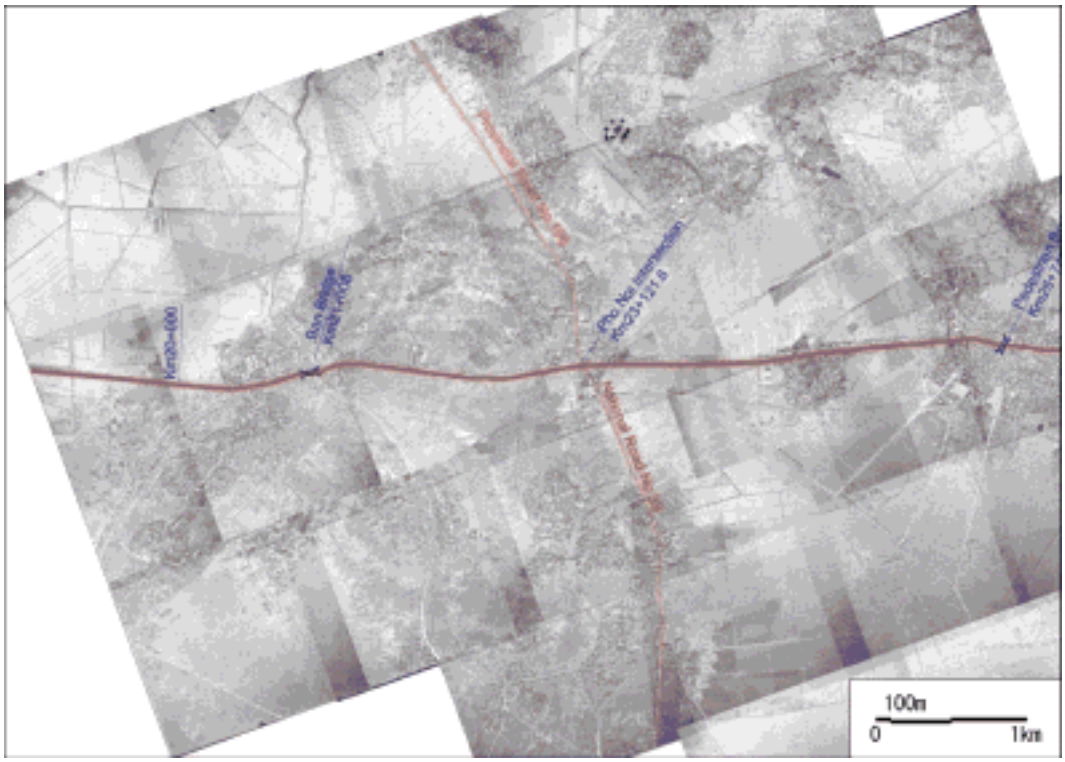


Figure 2.1.1.16 Aerial Photos Taken of Hung Yen
(Near Highway 5 and Highway 39 intersection)

Year 1993



Year 2003

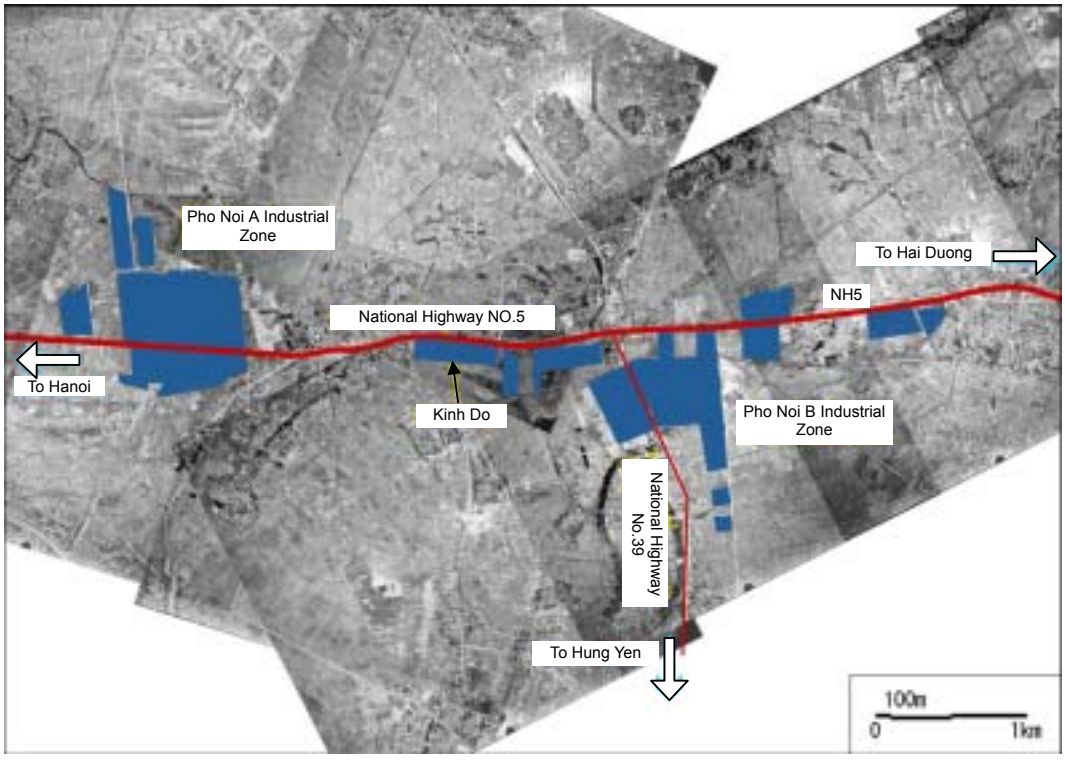
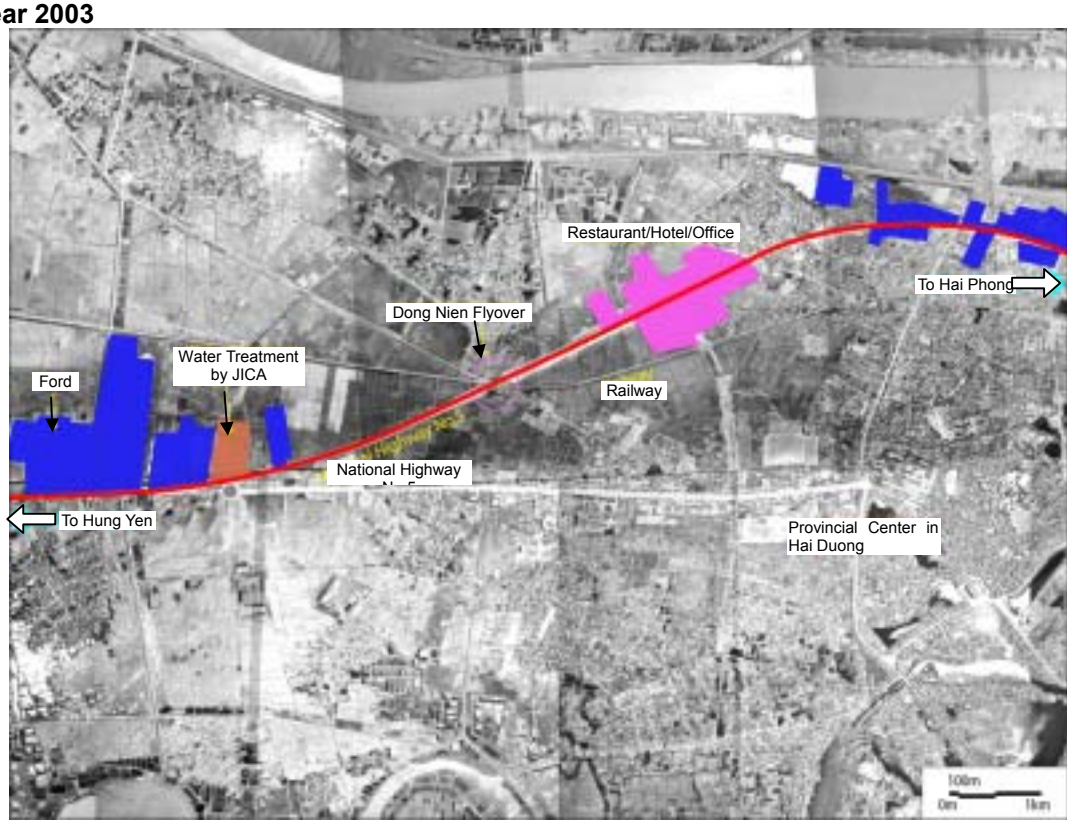


Figure 2.1.1.17 Aerial Photos Taken of Hai Duong
(Highway 5: Bypass of Hai Duong center)

Year 1993

Year 2003



2) Generated/attracted traffic to/from industrial complex

- Table 2.1.1.8 shows the number of enterprises in Hai Duong Province as of December 2001. The total number of employees is 33,677.
- On the other hand, the modal share of employees of interviewed enterprises in this study is shown in Figure 2.1.1.18.
- Assuming this modal share for Hai Duong Province, daily generated traffic from the industrial development in Hai Duong Province is roughly calculated as shown below:

Daily factory/office-goers = 33,677 * 0.8 = Approx. 27,000
Mode Motorbike: 27,000 * 0.39 / 1.25 = Approx. 8,420 (veh./day)
Minibus: 27,000 * 0.31 / 15 = Approx. 560
Bicycle 27,000 * 0.19 / 1 = Approx. 5,130
Others (Car) 27,000 * 0.06 / 2 = Approx. 810
Converted to pcu (passenger car unit) = 8,420*0.3 + 560*1.5 + 810 = Approx. 4,180 pcu/day

Table 2.1.1.8 Investors in Hai Duong Province

(1) FDI ENTERPRISES (31 Dec 2001)

Name of enterprise	No. of labors (pers.)	Turnover in 2001 (thous.USD)
Manufacturing	2,308	72,220
Transport. communication	6	165
Total	2,314	72,385

(2) CENTRAL STATE ENTERPRISES (31 Dec 2001)

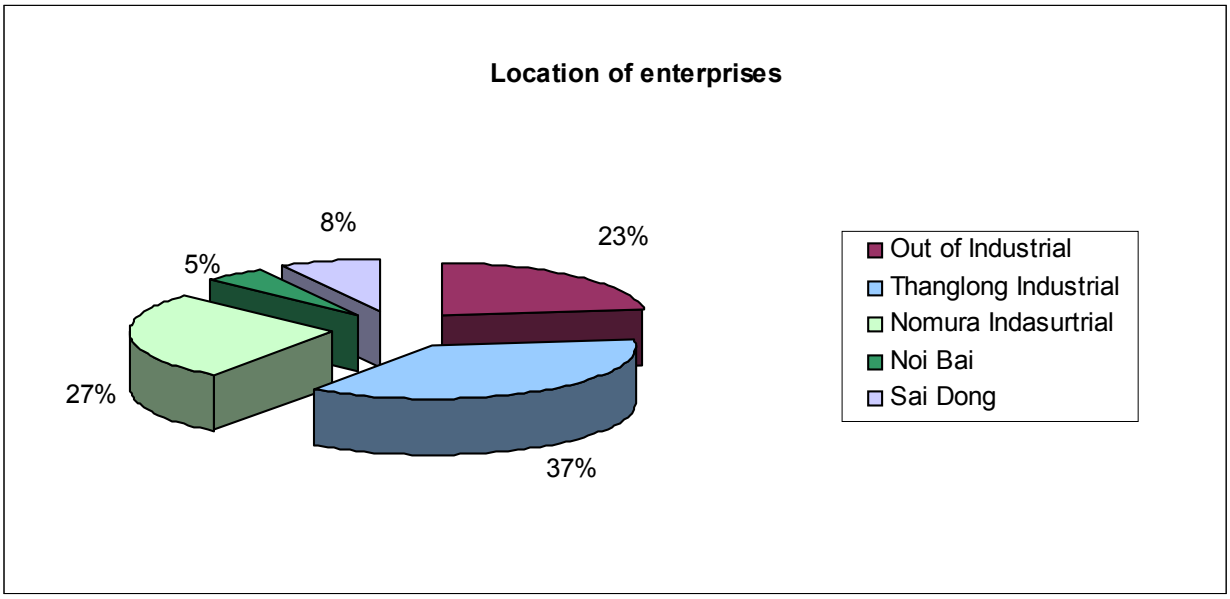
Name of enterprise	No. of labors (pers.)	Turnover in 2001 (thous.USD)
Agriculture, forestry	215	13,504
Mining	681	26,133
Manufacturing	5,661	1,505,544
Electricity and Water	2,962	1,256,312
Construction	5,596	218,242
Wholesale and Retail Trade, Repair	963	2,722,975
Transport, Telecommunication	737	96,317
Finance, Credit	813	245,874
Total	17,628	6,084,901

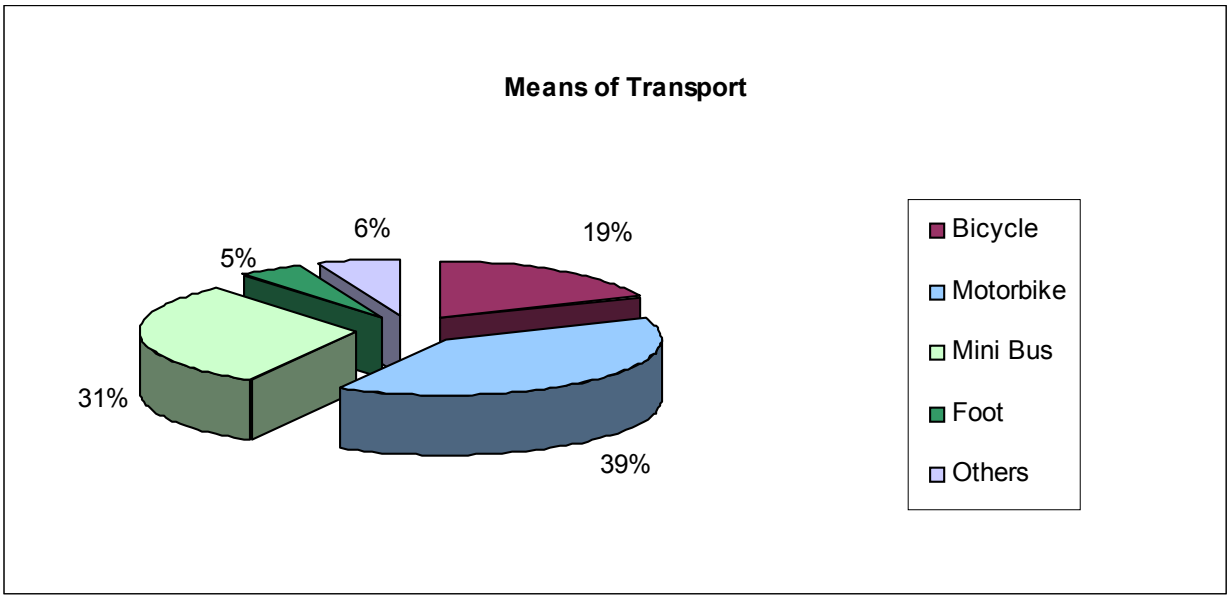
(3) LOCAL STATE ENTERPRISES (31 Dec 2001)

Name of enterprise	No. of labors (pers.)	Turnover in 2001 (thous.USD)
Agriculture. forestry	2,767	46,662
Fishing	100	624
Mining	449	27,117
Manufacturing	4,360	324,683
Water	243	14,540
Construction	3,150	178,346
Wholesale and Retail Trade. Repair	2,003	554,307
Hotels. restaurants	329	12826
Transport, Storage	122	6,248
Finance. Credit	27	17,325
Real Estate and Consultants	185	8,021
Total	13,735	1,190,699

Grond Total	33,677	7,347,985

Figure 2.1.1.18 Means of Transport by Employees of Interviewed Enterprises





2.1.1.7 Car/Motorcycle Ownership

- Vehicle ownership in Hanoi from 1994 to 1999 is shown in Table 2.1.1.9.
- Annual growth rate of total population in Hanoi was 4.14% from 1994 to 1999.
- Annual growth rates of number of registered cars and motorcycles during the same period were 17.33% and 11.32%, respectively.
- On the other hand, car and motorcycle ownership which is the number of cars/population and number of motorcycles/population are 12.66% and 6.89%, respectively. Growth rate of car ownership almost double compared with that of motorcycle ownership.
- Annual growth rate of PCU/1,000 population was approximately 9% from 1994 to 1999.

Table 2.1.1.9 Car/Motorcycle Ownership in Hanoi (1994 – 1999)

Items	1994	1995	1996	1997	1998	1999	Annual Growth Rate: 1994 - 1999 (%)
Population (*1,000)	2,194.4	2,335.4	2,395.9	2,467.2	2,553.7	2,688.0	4.14
No. of registered cars	42,733	47,260	57,945	84,115	89,455	95,002	17.33
No. of registered MC	390,027	462,295	536,130	574,248	602,229	666,672	11.32
PCU	181,108	209,579	247,757	298,447	314,851	342,505	13.59
No. of cars/1,000 pop.	19.5	20.2	24.2	34.1	35.0	35.3	12.66
No. of MC/1,000 pop.	177.7	198.0	223.8	232.8	235.8	248.0	6.89
PCU/1,000 pop.	82.5	89.7	103.4	121.0	123.3	127.4	9.07

Source: Figures on Social Development in "Doi Moi" Period in Vietnam, General Statistical Office, Ha Noi 2000

2.1.1.8 Traffic Accidents

- Total number of accidents, fatalities and injuries along the roads in the whole country in 2002 were 27,134, 12,800 and 30,733, respectively.
- In 2002, for every road accident there was 0.47 fatalities. This means one person was killed for every 2 accidents.
- 34% out of total accidents were caused by over speeding drivers and 72% were motorcycle drivers.
- 48% out of total number of accidents occur along National Highway.

Table 2.1.1.10 Road Traffic Accidents in Vietnam (1994-2002) and along Highway No.5 (1999-2002)

A. Road Traffic Accidents in Vietnam (1994 - 2002)

Items	1994	1995	1996	1997	1998	1999	2001	2002	Annual growth rate:1994 - 2002 (%)
Number of Accidents	13,760	14,328	17,582	19,159	20,246	21,538	25,040	27,134	8.86
Number of Injuries	14,174	18,234	19,410	21,905	22,882	24,179	29,188	30,733	10.16
Number of Deaths	4,907	4,625	5,342	5,680	6,189	7,095	10,477	12,800	12.73
Deaths/Accidents	0.36	0.32	0.30	0.30	0.31	0.33	0.42	0.47	3.56

Source: Figures on Social Development in "Doi Moi" Period in Vietnam, General Statistical Office, Ha Noi 2000

B. Road Traffic Accidents along HW No. 5 (1999 - 2002)

Items	1999	2000	2001	2002	Annual growth rate:1999 - 2002 (%)	Annual growth rate:2000 - 2002 (%)
Number of Accidents	251	363	311	376	14.42	1.77
Number of Injuries	137	160	90	108	-7.62	-17.84
Number of Deaths	41	47	24	49	6.12	2.11
Deaths/Accidents	0.16	0.13	0.08	0.13	-7.25	0.32

Source: Figures on Social Development in "Doi Moi" Period in Vietnam, General Statistical Office, Ha Noi 2000

Table 2.1.1.11 Cause of Traffic Accident (Whole country and Highway No.5)

Cause	Whole country (2002)		HW No. 5 (1999 - 2001)	
	Number	Percentage	Number	Percentage
Over speeding	5,299	33.8%	355	52.7%
Dangerous overtaking	3,699	23.6%	178	26.4%
Drunk driving	853	5.4%	5	0.7%
Encroaching lane	347	2.2%	8	1.2%
Lack of observation	1,965	12.5%	0	0.0%
No keeping safe distance	0	0.0%	99	14.7%
Sleeping driving	0	0.0%	22	3.3%
Pedestrian	395	2.5%	6	0.9%
Others	3,123	19.9%	0	0.0%
Total	15,681	100.0%	673	100.0%

2.1.2 Effects of Rehabilitation Projects

2.1.2.1 Economic Analysis of Highway No. 5 Improvement

(1) Introduction

The functions of HW No. 5 are to connect not only Hanoi, the capital of Vietnam, and Hai Phong, the only port city in northern Vietnam, but also the inter-provincial roads along the Hai Duong and Hung Yen provinces. More importantly, HW No. 5 will cater for the traffic of every day life along the road.

The improvement of HW No. 5 distributes large direct and indirect benefits to users of road and ultimately the whole Northern region of Vietnam. Among these direct and indirect benefits of improvement of Highway No. 5 are reductions of vehicle operating cost and travel time cost, which will be discussed later on the basis of a quantitative analysis.

On the other hand, the traffic on Highway No. 5 before improvement was characterized mainly as the combination of normal traffic and traffic to/from Hai Phong Port. However, the traffic characteristics of Highway No. 5 after improvement have drastically changed due to the improvement of transport conditions on Highway No. 5. These are basically divided into four categories below:

a. Normal traffic: It is assumed that the growth rate of normal traffic correlates with population increase and car ownership increase.
b. Traffic to/from Hai Phong Port: This is based on the traffic survey of this study and trend of cargo throughput in Hai Phong Port.
c. Induced traffic: This is mainly due to the land development along the improved Highway No. 5.
d. Diverted traffic: In general, it is assumed that the diverted traffic, which was using the other roads, more generated after improvement of Highway No. 5. However, the majority of traffic in the Red River Delta concentrated on Highway No. 5 even before improvement, because most of the other roads in the Red River Delta such as Highway No. 10 and No. 18 were narrow and deteriorated 2-lane roads. Many crossing points at rivers in both ways were transported by ferries. Therefore, the traffic of the road network after improvement in the Red River Delta tends to disperse more than before improvement. Therefore, the diverted traffic on the Highway No. 5 is not considered in this study.

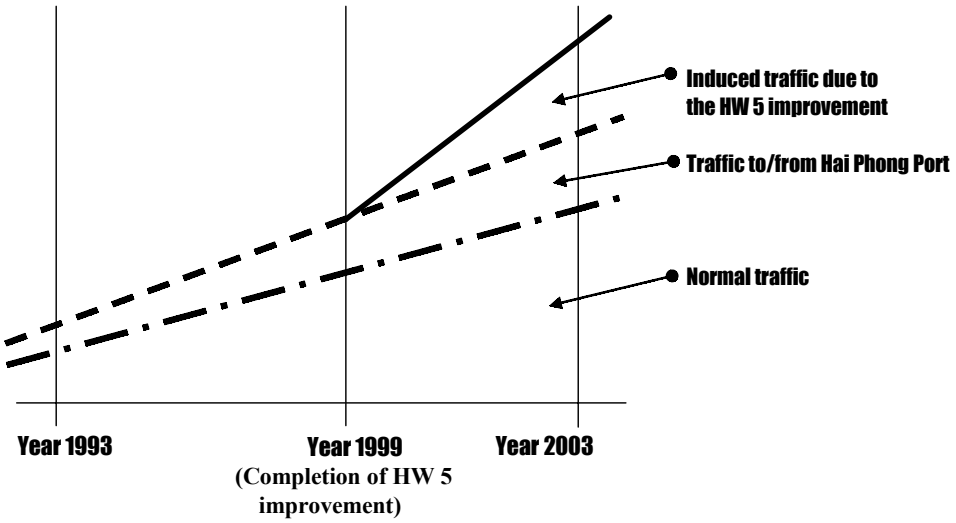
(2) Composition of Highway No. 5 Traffic

Considering the above conditions, the economic analysis of the impact of Highway No. 5 improvement is assessed by using the cost-benefit analysis based on the three classifications of normal traffic, traffic to/from Hai Phong Port and induced traffic of improved Highway No. 5 as shown in Figure 2.1.2.1.

The basic considerations of benefit of each class of traffic are as follows:

a. Normal traffic: Reductions of vehicle operation cost and travel time cost are considered. The result of Feasibility Study of Highway No. 18 is used for the vehicle operating cost and travel time cost.
b. Traffic to/from Hai Phong Port: Reductions of vehicle operation cost and travel time cost are also considered. The result of Feasibility Study of Highway No. 18 is used for the vehicle operating cost, and travel time cost of cargo truck is studied in this project.
c. Induced traffic: The benefit is the same as normal traffic's. However, the reduction of travel time cost is mainly caused by business trips made to/from development along Highway No. 5. Therefore higher figures are used for the travel time cost

Figure 2.1.2.1 Conceptual Categorization of the Volume of Highway No. 5 Traffic



Traffic volume in 2003 obtained from the survey is used for the analysis following careful consideration of the trend of the previous data from PMU 5 and the data from the toll gate along Highway No. 5. The traffic counting on Highway No.5 was conducted on February 12, 2003, Wednesday. According to the hearing results from transport operators and owners of factories along Highway No.5, the average traffic volume on Highway No.5 can be observed either Wednesday or Thursday in the week and, therefore, the above date was selected for conducting trarffic-counting survey.

The resulting volume of the Highway No. 5 traffic by classification in 2003 is summarized in Table 2.1.2.1.

Table 2.1.2.1 Composition of Highway 5 Traffic in 2003

Items	HW 1 - HW 39	HW 39 - HW 183	HW 183 - Hai Phong	Remarks
Total (Veh./day, Excl. bicycle) A = B + C + D	24,105	18,328	11,047	Refer to Table 2.1.1.3
Normal Traffic (B)	9,312	7,372	9,938	Annual growth rate from 1993 to 2003 = 9.6% (Based on the annual growth rate of population in 4 cities/provinces and the annual growth rate of car ownership in Hanoi)
Hai Phong Port Traffic (C)	627	627	660	Based on the survey result. Only truck
Induced Traffic (D)	14,166	10,329	449	D = A - B - C

(3) Cost-Benefit Analysis

1) Economic Cost and Maintenance Cost
Based on the JBIC data, economic cost, which is construction cost excluding price escalation, management service, tax and land acquisition for cost-benefit analysis, is summarized as shown in Table 2.1.2.2. And the maintenance cost is assumed at 5% of construction cost.

Table 2.1.2.2 Economic Cost

Item \ Year	1995	1996	1997	1998	1999	Total
Total Cost (Mil. Dong)	127,500	301,700	748,800	526,500	83,300	1,787,800

2) Vehicle Operating Cost and Travel Time Cost
The benefits considered for the cost and benefit analysis are the reduction of vehicle operating cost (VOC) and travel time cost (TTC) of road user by the improvement. VOC and TTC based on the feasibility study of Highway No. 18 and studied in this project are summarized in Table 2.1.2.4.

3) Benefit
Based on the result of the analysis of composition of Highway No. 5 traffic shown in Table 2.1.2.1, VOC and TTC, and travel speed along Highway No. 5, the benefit in 2003 of the improvement of Highway No. 5 is calculated as shown in Table 2.1.2.5. The calculation of benefit started in 2000. The benefits between 2000 and 2005 are assumed to have an increase rate of 19%, which is the increase rate between 1999 and 2003 of road traffic along Highway No. 5. And after 2010 the benefits are assumed to increase by 9.1% per annum based on the increase rate of trip ends between the years of 2010 and 2020, which is estimated by Feasibility Study of Highway No. 10. The increase rate of benefit between 2006 and 2010 of 14%, which is the average of 19% (2000 – 2005) and 9.1% (2010 – 2020), is adopted.

4) Others
Details of other conditions are as follows:
a. Discount Rate: 12% (Based on the related studies, such as 'SAPROF on National Highway NO. 10 Improvement Project in Vietnam, March 1997 by OECF)
b. Project Life: 20 years

5) Result of Cost-Benefit Analysis
The result of cost-benefit analysis for the improvement of Highway No.5 is shown in Tables 2.1.2.3 and 2.1.2.4-6. The EIRR is higher than the opportunity cost of capital (discount rate = 12%). Thus, investing in these projects is economically feasible.

Table 2.1.2.3 Result of Cost-Benefit Analysis

Items	Figures
Benefit-cost Ratio (B/C Ratio)	2.037
Economic Internal Rate of Return (EIRR)	19.71%
Net Present Value (NPV)	1,848,650 Million Dong

Table 2.1.2.4 Vehicle Operating Cost and Travel Time Cost

■Vehicle Operating Cost (Economic Price in 1995)

Unit: Dong

km/hour	Car	Bus	Truck	M/C
10.00	4,081.02	5,328.61	5,780.43	394.98
15.00	3,746.12	4,955.83	5,267.57	367.69
20.00	3,436.94	4,620.32	4,803.32	344.56
25.00	3,153.49	4,322.09	4,387.69	325.57
30.00	2,895.76	4,061.13	4,020.67	310.74
35.00	2,663.76	3,837.45	3,702.27	300.05
40.00	2,457.48	3,651.04	3,432.48	293.52
45.00	2,276.93	3,501.91	3,211.31	291.13
50.00	2,122.10	3,390.05	3,038.75	292.90
55.00	1,993.00	3,315.47	2,914.81	298.81
60.00	1,889.62	3,278.16	2,839.48	308.87
65.00	1,811.97	3,278.13	2,812.77	323.09
70.00	1,760.04	3,315.37	2,834.67	341.45
75.00	1,733.84	3,389.89	2,905.19	363.97
80.00	1,733.36	3,501.68	3,024.32	390.63
85.00	1,758.61	3,650.75	3,192.07	421.45
90.00	1,809.58	3,837.09	3,408.43	456.41
95.00	1,886.28	4,060.71	3,673.41	495.53
100.00	1,988.70	4,321.60	3,987.00	538.79

■Travel Time Cost (Economic Price in 1995)

Unit: Dong

Type of Vehicle	Occupancy	Per hour	Per minute
Car	2.80	7,730	128.8
Bus	29.30	11,344	189.1
M/C	1.06	1,685	28.1
Truck		4,955	82.6
Large Truck		9,909	165.2

Note: Details of the calculation of vehicle operating cost and travel time cost refer to Appendix 1, 2 and 3.

Table 2.1.2.5 Benefit of Highway No. 5 Improvement in 2003

◆Normal Traffic — Unit:Dong

	Private Car		Bus		Truck		Motorcycle		Total(1 day)		Total(1 year)	
	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC
(1)With case	101,465,161	6,917,843	421,694,635	24,321,082	967,416,544	16,502,722	142,141,706	12,923,926	1,232,718,047	60,665,573	449,942,087,141	22,142,934,274
(2)Without case	169,330,009	16,602,824	555,983,285	58,370,597	876,797,124	39,606,533	149,827,032	31,017,422	1,751,937,450	145,597,376	639,457,169,109	53,143,042,257
(1) – (2)	-67,864,848	-9,684,981	-134,288,650	-34,049,515	-309,380,580	-23,103,811	-7,685,326	-18,093,496	-519,219,403	-84,931,803	-189,515,081,969	-31,000,107,983

◆Hai Phong Port Traffic — Unit:Dong

	Private Car		Bus		Truck		Motorcycle		Total(1 day)		Total(1 year)	
	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC
(1)With case					65,955,593	3,836,113			65,955,593	3,836,113	24,073,791,401	1,400,181,248
(2)Without case					101,917,497	9,206,671			101,917,497	9,206,671	37,199,886,525	3,360,434,995
(1) – (2)	0	0	0	0	-35,961,904	-5,370,558	0	0	-35,961,904	-5,370,558	-13,126,095,125	-1,960,253,747

◆Induced Traffic — Unit:Dong

	Private Car		Bus		Truck		Motorcycle		Total(1 day)		Total(1 year)	
	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC
(1)With case	285,950,400	38,991,906	124,018,475	7,152,720	214,844,900	6,248,541	151,806,137	13,811,735	776,719,912	66,204,903	283,502,767,957	24,164,789,524
(2)Without case	477,207,971	93,580,576	163,512,156	17,166,527	331,987,836	14,996,499	160,119,406	33,148,165	1,132,827,370	158,891,767	413,481,989,997	57,995,484,857
(1) – (2)	-191,257,571	-54,588,669	-39,493,681	-10,013,808	-117,142,936	-8,747,958	-8,313,269	-19,336,429	-356,107,458	-92,686,864	-129,979,222,041	-33,830,695,333

◆Total Traffic — Unit:Dong

	Private Car		Bus		Truck		Motorcycle		Total(1 day)		Total(1 year)	
	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC	VOC	TTC
(1)With case	387,415,561	45,909,750	545,713,110	31,473,802	848,217,038	26,587,376	294,047,843	26,735,661	2,075,393,552	130,706,589	757,518,646,498	47,707,905,046
(2)Without case	646,537,980	110,183,399	719,495,441	75,537,125	1,310,702,457	63,809,704	309,946,438	64,165,586	2,986,682,317	313,695,814	1,090,139,045,632	114,498,972,108
(1) – (2)	-259,122,419	-64,273,650	-173,782,331	-44,063,323	-462,485,420	-37,222,327	-15,898,595	-37,429,925	-911,288,765	-182,989,225	-332,620,399,134	-66,791,067,063

Table 2.1.2.6 Cost and Benefit Analysis of Highway No.5 Improvement

(Unit: Million Dong)

Year	Econ. Cost	Maint. Cost	Without		With		COST	BENEFIT	B-C	Dis. Cost	Dis. Benefit	Dis. B - Dis. C	No.
			VOC	TTC	VOC	TTC	TOTAL C	TOTAL B		(12%)	(12%)	(12%)	
1995	127,500						127,500		-127,500	127,500	0	-127,500	1
1996	301,700						301,700		-301,700	269,375		-269,375	2
1997	748,800						748,800		-748,800	596,939		-596,939	3
1998	526,500						526,500		-526,500	374,752		-374,752	4
1999	83,300						83,300		-83,300	52,939	0	-52,939	5
2000	0	75,235	646,906	67,946	449,524	28,311	75,235	237,017	161,782	42,690	134,490	91,799	6
2001	0	75,235	769,818	80,855	534,933	33,690	75,235	282,050	206,815	38,116	142,895	104,779	7
2002	0	75,235	916,083	96,218	636,571	40,091	75,235	335,639	260,404	34,032	151,826	117,794	8
2003	0	75,235	1,090,139	114,499	757,519	47,708	75,235	399,411	324,176	30,386	161,315	130,929	9
2004	0	75,235	1,297,265	136,254	901,448	56,773	75,235	475,299	400,064	27,130	171,398	144,267	10
2005	0	75,235	1,543,746	162,142	1,072,723	67,559	75,235	565,606	490,371	24,224	182,110	157,886	11
2006	0	75,235	1,759,870	184,842	1,222,904	77,018	75,235	644,791	569,556	21,628	185,362	163,734	12
2007	0	75,235	2,006,252	210,720	1,394,110	87,800	75,235	735,061	659,826	19,311	188,672	169,361	13
2008	0	75,235	2,287,127	240,221	1,589,286	100,092	75,235	837,970	762,735	17,242	192,041	174,799	14
2009	0	75,235	2,607,325	273,851	1,811,786	114,105	75,235	955,286	880,051	15,395	195,470	180,076	15
2010	0	75,235	2,972,351	312,191	2,065,436	130,080	75,235	1,089,026	1,013,791	13,745	198,961	185,216	16
2011	0	75,235	3,242,835	340,600	2,253,391	141,917	75,235	1,188,127	1,112,892	12,272	193,809	181,537	17
2012	0	75,235	3,537,933	371,595	2,458,449	154,831	75,235	1,296,247	1,221,012	10,958	188,791	177,833	18
2013	0	75,235	3,859,884	405,410	2,682,168	168,921	75,235	1,414,205	1,338,970	9,784	183,903	174,119	19
2014	0	75,235	4,211,134	442,302	2,926,245	184,293	75,235	1,542,898	1,467,663	8,735	179,141	170,406	20
2015	0	75,235	4,594,347	482,551	3,192,533	201,063	75,235	1,683,302	1,608,067	7,799	174,502	166,703	21
2016	0	75,235	5,012,433	526,464	3,483,054	219,360	75,235	1,836,482	1,761,247	6,964	169,984	163,020	22
2017	0	75,235	5,468,564	574,372	3,800,012	239,322	75,235	2,003,602	1,928,367	6,218	165,583	159,365	23
2018	0	75,235	5,966,203	626,640	4,145,813	261,100	75,235	2,185,930	2,110,695	5,551	161,295	155,744	24
2019	0	75,235	6,509,128	683,664	4,523,082	284,860	75,235	2,384,849	2,309,614	4,957	157,119	152,162	25
2020	0	75,235	7,101,459	745,877	4,934,683	310,783	75,235	2,601,871	2,526,636	4,426	153,051	148,625	26
Total	1,787,800	1,579,935	67,400,803	7,079,211	46,835,668	2,949,677	3,367,735	24,694,669	21,326,934	1,783,068	3,631,719	1,848,650	

B / C	2.037
EIRR %	19.71
NPV (Million Dong)	1,848,650

2.1.2.2 Economic Analysis of Hai Phong Port Rehabilitation

(1) The Hinterland of Hai Phong Port
Hai Phong Port is about 36 km upstream from the river mouth of Cua Cum River. The Port was originally constructed in 1876 and has served as the port for the international trade of Northern Vietnam since its start of operation. The hinterland of the Port is the populous Red River Delta area of Northern Vietnam, which has connected to various parts of the Delta area by well-developed but not-well-maintained road and rail networks and inland waterways. The upgrading of road network has recently been implemented quite extensively and is now re-emerging as a quite modernized network. The rail network and inland waterways still await for modernization and expansion of their capacities. The Port is situated 100 km east to the Capital City of the Country, Hanoi.

(2) Port Facilities before the Project
The Port consisted of Main Port (including Vat Cach Port) and Chua Ve Port, the total length of berths was 2,236m and 330m respectively. The Main Port was designed to handle general cargo and bulk cargoes (ores, cement, rice and cereals, wood products, etc.), but also handled containers at berths No. 1 and 7 in order to supplement the low capacity of Chua Ve container berths (2 berths).

The cargo handling equipment of the Port was mainly supplied by the former Soviet Union in late 1960s. They were obsolete and lacked spare parts and materials. Since the Port was designed and constructed before the age of containerization, the increase of container handling capacity was particularly felt urgent.

(3) Cargo Volume Handled before the Project
The cargo volume handled at Hai Phong Port in 1990-1992 was in continuous decline (see Table 2.1.2.7). The highest cargo volume at the Port recorded 3 million tons in 1988 and, since then the figure has continuously decreased. This declining trend was caused by the decrease in trade with Russia and East European countries, which were traditionally major suppliers of inputs and markets of Vietnamese products. The major partners of international trade in that period already shifted to other Asian countries.

Contrary to the downward trend of cargo volume handled at the Port, the container volume handled at the Port had an upwards trend. The container volume in 1992 reached 273,600 tons or 34,000 TEUs and indicated a substantial increase compared with container handling volume in previous years.

Table 2.1.2.7 Cargo Handling Volume in Hai Phong Port (1990–1993)

(Unit: ton, TEU)

Cargo	1990	1991	1992
Total Cargo Volume (tons)	2,515,976	2,433,373	2,378,165
Export Cargo Total	524,373	403,875	381,538
Container	12,640	51,455	115,910
Logs,Timber	58,765	158,453	97,668
Metal (mainly scrap)	227,375	119,116	74,818
Ore (Zinc)	2,919	18,491	40,765
Rice	14,510	1,997	25,055
General Cargo	153,457	34,527	12,622
Others	54,707	19,836	14,700
Import Cargo Total	976,443	621,213	848,920
Container	281,497	313,244	374,264
Fertilizer	40,377	100,024	117,390
Metal	202,104	28,238	99,171
Ore (Cupper)	81,605	39,441	58,591
Wheat Flour	40,578	23,888	33,291
Asphalt	27,722	11,544	31,510
Others	302,560	104,834	134,703
Domestic Cargo Total	1,015,160	1,403,280	1,147,714
Cement	185,130	328,265	493,245
Food (Mainly Sugar)	147,517	457,480	285,378
Construction Materials	217,628	224,788	99,185
Fertilizer	65,161	60,994	64,021
Clinker	257,879	169,490	31,849
Others	141,845	162,263	174,036

Source: Hai Phong Port

Table 2.1.2.8 Container Cargo Volume in Hai Phong Port (1990-1993)

(Unit: ton, TEU)

			1990	1991	1992
Import	Main Port No.1	Stuffed TEU	463	1,930	3,832
		Empty TEU	79	179	180
		Tons	5,843	20,777	36,837
	Main Port No.7	Stuffed TEU	0	669	2,891
		Empty TEU	0	0	57
		Tons	0	7,840	25,496
	Chua Ve	Stuffed TEU	8,445	6,354	9,785
		Empty TEU	105	76	89
		Tons	90,949	66,756	102,040
	Total Import	Stuffed TEU	8,908	8,952	16,508
		Empty TEU	184	255	326
		Total TEU	9,092	9,207	16,834
		Tons	96,692	95,373	164,373
Export	Main Port No.1	Stuffed TEU	268	1,374	3,341
		Empty TEU	26	735	970
		Tons	3,343	16,007	33,727
	Main Port No.7	Stuffed TEU	0	176	459
		Empty TEU	0	39	2,141
		Tons	0	2,047	8,269
	Chua Ve	Stuffed TEU	8,015	3,887	5,159
		Empty TEU	1,155	3,709	5,207
		Tons	67,773	45,580	67,234
	Total Import	Stuffed TEU	8,283	5,437	8,959
		Empty TEU	1,181	4,483	8,318
		Total TEU	9,464	9,920	17,277
		Tons	71,116	63,634	109,230
Total		Stuffed TEU	17,191	14,389	25,467
		Empty TEU	1,365	4,738	8,644
		Total TEU	18,556	19,127	34,111
		Tons	167,808	159,007	273,603

Source: Hai Phong Port

(4) Projected Cargo Volume Forecast

The JICA Study[1] conducted in June – August 1993 forecasted the future volume of cargoes to be handled at Hai Phong Port as 5.6 million tons (export cargo 1.7 million tons; import cargo 1.7 million tons; domestic cargo 2.4 million tons) in the year 2000. The container cargo volume was forecasted to be 1,593,000 tons or 199,000 TEUs in the year 2000, of which export containers were 709,000tons (113,000TEUs) and imports 884,000tons (86,000 TEUs).

[1] The Overseas Coastal Area Development Institute of Japan (OCDI) and Nippon Koei Co., Ltd. (NK), "The Urgent Rehabilitation Plan of hai Phong Port – The master plan Study on the Transport Development in the Northern Part of the Socialist Republic of Viet Nam", September 1993

Apart from JICA's cargo handling projection, VINAMARINE conducted the forecast of cargo volumes to be handled at Hai Phong Port; the total volume of cargo in 2000 was 7 million tons (export cargo 2.2 million tons; import 2.5 million tons; domestic cargo 2.3 million tons).

(5) Originally Planned Scope of the Project

The Hai Phong Port Rehabilitation Project was originally planned and designed as "The Urgent Rehabilitation Plan" by JICA in 1993. The original plan included the following components:

1) Civil Works:
   – Rehabilitation of navigation channel of the Hai Phong Port
   – Terminal rehabilitation of Main Port and Chua Ve Port, including new berth of 150m long, new container yard of 36,000 sq m, improvement of existing container yard of 62,000 sq m. and construction of buildings (container freight station, workshops, water supply facilities, gate with weight facilities, electrical substations, garages and fuel stations)
2) Procurement of port equipment for Main Port and Chua Ve Port
   – Container handling equipment at Chua Ve Container Terminal, including 2 quayside gantry cranes, 4 rubber tyred gantry cranes, Container Terminal Management System (soft and hard)
   – Floating equipment, including 3 units of 1,300 PS tugboats and 2 units of 150 PS speed boats
3) Consulting services
   – Detailed design, tender assistance, supervision, and training

(6) Modification of the Project

The scope of the Project was modified in the process of project implementation. The revised parts of the project's scope were reviewed in the Project Completion Report and is analyzed as follows[2]:

1) Rehabilitation of navigation channel of the Hai Phong Port was omitted; and
2) The on-land construction works were conducted only at Chua Ve Port section and the projected Main Port section was omitted.

The main reason for omitting the channel dredging work was that Vietnamese authorities and scientists considered that a more detailed study was required to find the best solution to the Hai Phong Port channel siltation problem. At that time, the Belgium Government offered an aid to the study of the channel rehabilitation before any large scale dredging was to be implemented and the Government of Vietnam accepted the Belgian offer and omitted the dredging work in the first phase of Hai Phong Port Rehabilitation Project.

The revision of the land facilities was caused by the rapid increase of container traffic in early 1990s. The land area adjacent to Chua Ve Port section was available, while expansion at the Main Port in the city center was not possible. In addition, the approved budget was not enough to conduct all Project items and it was necessary to cancel some items. Therefore, the Main Port portion was cut off and budget was concentrated on establishment of fully containerized facilities in Chua Ve Port area.

The Project was implemented in the following schedule:

– Consulting services:	
Feasibility review and detailed design	Nov.1995-Jun. 1996
Construction supervision	Feb. 1998-Jun. 2000
– Tug boats and speed boats provision	Apr. 1998-May 1999
– Civil and building works	Mar. 1998-Jun. 2000
– Cargo handling equipment	Nov. 2000-Nov. 2001

[2] The Project Management Unit and Nippon Koei Co., Ltd., "Project Completion Report", April 2002.

(7) Cargo Volume after the Project Implementation

The new berth of Chua Ve Port was officially handed over to the Vietnamese authority in February 2000, although some remaining works were implemented until June 2000. The cargo volume handled at the Main Port and Chua Ve Port are shown in Table 2.1.2.9.

Table 2.1.2.9 Cargo Handling Volume in Hai Phong Port

(Unit: '000 Tons, '000TEU)

Cargo		1998	1999	2000	2001	2002
Port Total–All Cargo						
Cargo Volume (tons)	<a>	5,446	6,510	7,646	8,576	10,519
Import Cargo (tons)	**<b>**	2,618	3,170	3,586	4,358	5,315
Export Cargo (tons)	**<c>**	850	939	1,234	1,336	1,377
Domestic Cargo (tons)	<d>	1,978	2,400	2,825	2,882	3,827
Port Total–Container Cargo						
Container (tons)	<e>	1,855	2,231	2,509	2,738	4,023
(TEUs)		184	199	219	227	344
Stuffed (TEUs)		134	153	172	179	264
Empty (TEUs)		50	46	47	48	80
A. Main Port						
Container (tons)		602	726	752	845	756
(TEUs)		59	61	52	59	48
Stuffed (TEUs)		41	46	38	46	39
Empty (TEUs)		18	16	14	13	9
B. Chua Ve Port						
Container (tons)	<f>	1,253	1,505	1,757	1,893	3,267
(TEUs)		125	138	167	168	296
Stuffed (TEUs)		93	107	134	134	226
Empty (TEUs)		32	31	33	34	70
Characteristics of Cargo Handling at Hai Phong Port						
Share of Import Cargo (%):b/a		48	49	47	51	51
Share of Export Cargo (%):c/a		16	14	16	16	13
Share of Domestic Cargo (%):d/a		36	37	37	34	36
Share of Container Cargo(%):e/a		34	34	33	32	38
Share of Chua Ve(%): f/e		68	67	70	69	81

Source: Hai Phong Port

The cargo volume handled at Hai Phong Port both at Main Port and Chua Ve Port has increased in higher rate than the cargo volume projected in the 1993 Master Plan conducted by JICA (cf. Section (4) above). The JICA Study envisaged the total cargo throughput of the Port Total in the year 2000 as 5.6 million tons, but actually the port realized the total throughput of 7.6 million tons in the same year. In the year 2002, the total throughput reached 10 million tons.

The achievement of container cargo throughput in the year 2000 was 2.5 million tons or 219,000 TEUs, while the JICA Master Plan Study projected to be 1.6 million tons or 199,000 TEUs in the same year. The actual rate of stuffed container was much higher than the Master Plan's projection, the figure of total throughput (tons) has much exceeded the figure of TEUs.

The increase of container cargo is much higher than that of total cargo. Average yearly rate of increase of container cargo for 1998-2002 was 21.3% per year, while that of total cargo of Hai Phong Port was

17.9% per year. The average rate of increase in the Chua Ve Port was even higher and was 27.1% per year in the same period and the share of container handling at Chua Ve Port has now achieved more than 80 % of container handling at Hai Phong Port total.

(8) Assessment of Project's Performance

The higher cargo throughput achievement of Hai Phong Port than the projected throughput in the Master Plan and particularly good results of container handling at the Chua Ve Port suggest the satisfactory performance of the loan project for the rehabilitation of Hai Phong Port. However, the data provided by the Hai Phong Port is not good enough to calculate indicators for the economic and financial evaluation of the Project. Particularly, following data are lacking for the analyses:

– Detailed revenue/expenditure statement of the Port total and Chua Ve Port,
– Container ships' staying cost (US$/day) at port by size of ships, and
– Number of vessels with the information on vessel type and size.

Therefore, the Study Team has observed the good results of port performance from the port's traffic data and is well confident that the Project has achieved the target of economic and financial feasibility of the Project, but not possible to exemplify it by the concrete figures.

2.2 Impacts on local economy and society

A local market along Highway No.5

2.2.1 Basic economic features of the region

The Highway No.5 crosses the Red River Delta from west to east. It is the very important highway in the Delta, connecting the capital city with its main seaport. It is assumed that the improvement of the highway will have direct impacts on four provinces which are Ha Noi, Hung Yen, Hai Duong and Hai Phong (see Figure 2.2.2.1). Basic economic and social aspects of these provinces are described in the following texts and tables (Table 2.2.1.1 – Table 2.2.1.4).

Figure 2.2.1.1: Four Provinces along the Highway No.5

Ha Noi

Ha Noi is the capital city of the country with a population of around 2.8 million. The city enjoyed rapid economic growth in the last few years. The annual growth rates of gross regional product and industrial gross output in 2002 reached 9.5% and 10.9% respectively. Poverty is not a serious problem in the capital city, and only 1% of the households is classified under the poverty line. The Hai Phong port, which is connected with Ha Noi by the Highway No.5, is the only seaport for the city. Before renovation of the highway, the road condition was not favorable. The traffic was often disrupted at the two bridges, which were shared with railway. The distance from Ha Noi to Hai Phong Port is only 100km but travel between the two cities usually took four to five hours. The renovation of the Highway No.5 dramatically improved the traffic condition, and now people in Ha Noi can reach Hai Phong within two hours by car. The improved road condition, however, has created series of traffic jams. Gia Lam district, the starting point of the Highway No.5, is now considered to be a bottleneck of car traffic.

One of the major wholesale markets of agricultural products is formed under the Long Bien Bridge in Gia Lam district where hundreds of wholesalers and farmers come in early mornings. The improvement of the Highway No.5 has brought an “uncountable” number of wholesalers to the market from neighboring

Hung Yen province. A wider variety of vegetables and fruits are now available in the market.

Ha Noi has the lion's share in the inflow of FDI to the Red River Delta. The total amount of FDI to the city was over US$ 3 billion at the end of 2002. There are four major industrial zones which are developed by foreign capital. Most foreign enterprises in these zones use the Hai Phong Port to import their inputs and export their products. It is estimated that 90% of these foreign enterprises would not have come to Ha Noi without the improvements of the Highway No.5 and the Hai Phong Port.

Hung Yen

Hung Yen is one of the new provinces of the country, which was separated from Hai Duong in 1997. The land area is small but the province has over 1 million inhabitants. The new highway No.5 crosses two northern districts of the province, Van Lan and My Hao. The provincial capital city, Hung Yen town, is around 30 km south from the highway. Hung Yen town and the highway are connected by Highway No. 39, which was also recently renovated with local and JBIC funds. The distance from Hung Yen town to the center of Ha Noi is about 65km. The western part of the province is separated from Ha Tay province by the Red River. There is a moderately developed road on the bank of the Red River, but there is no bridge to connect the two provinces.

The impact of the Highway No.5 is considered to be the largest in this province. Before the renovation of the highway, Hung Yen was just a poor agricultural province without any major industrial or commercial activities. The state investment for industrial production remained limited. With regards to the value of industrial production, the province ranked 49th out of 61 provinces of the country in 1996. The new Highway No.5 dramatically changed the economic position of the province. The growth rate of gross regional product reached 14.5% in 1999 and was kept over 10% in 2000. The expansion of industrial production was particularly impressive during this period, and the industrial share of GRP rose from 14.5% in 1999 to 27.3% in 2000. The industrial output of the province now ranks 19th of all provinces. The recent massive inflow of industrial investors is surely the most important factor of industrial development. The provincial authority has developed four industrial zones along the Highway No.5, and they are almost fully occupied by foreign and domestic private enterprises, creating around 13,000 jobs. One of the concerns of the local authority is the unbalanced development between the northern districts along the Highway No.5 and the southern remote provinces. The Provincial Peoples' Committee has a plan to develop two industrial zones in the southern provinces to attract foreign and domestic investments to the south.

A striking characteristic of the province is the high level of educational achievement. Despite the relatively poor average income, the province is one of the first eight provinces of the country, which have achieved the universal secondary education in 1991[1]. The province also has a number of higher educational institutions, including universities and colleges. Some of them were evacuated from the neighboring capital city to avoid the US air raid during the war.

Hai Duong

Hai Duong Province is another populous province along the Highway No.5, with the total population of 1.7 million. The Highway No.5 crosses the center of the province from west to east, and the provincial capital, Hai Duong Town, 58km from Ha Noi, is just on the highway. Another national highway on the northern district of Hai Duong Province is the Highway No.18 which is also an important transport infrastructure linking Ha Noi with the Cai Lan port in Quang Ninh Province. The two highways are connected by the Highway No. 183. Several big rivers run through Hai Duong Province, including Kinh Thay, Thai Binh, Tu Ky, Luc Dau and Luoc Rivers. They often disturb internal transport among villages and towns, except for the Kinh Thay River which has a good bridge on the Highway No.183. The central

[1] Other seven provinces are Hanoi, Hai Phong, Hai Duong, Thai Binh, Ha Nam, Nam Dinh and Bac Ninh, all of which are located in the Red River Delta.

districts on the Highway No.5 and the northern district on the Highway No.18 have recently attracted lots of new investments, including Ford Motor, and the local business activities have been much stimulated. The southern districts, however, are relatively left behind from the new changes, and many farming households are still poor.

Hai Duong Province has several large state industrial investments, such as Hoang Thach Cement and Pha Lai Thermal Power plants. Hence, the industrial share in GRP is high, even before the recent inflow of FDI. Due to new foreign investments, the share of industrial production in GRP becomes even higher and reached 39.4% in 2000, which was the highest among the four provinces along the Highway No.5. The annual growth rate of industrial production is also very high, recording 10.5% in 2001. The agriculture sector, however, has also faced structural changes. As the province is well connected to Hai Phong port, many farmers started producing agricultural products for export. Pigs and flowers for the Chinese market are typical examples of agricultural exports. CP ltd. a large agribusiness company of Thailand is looking for new business opportunities in the province, including the production of livestock feeds.

The province also has a wide range of educational facilities, including five vocational schools that are managed by the line ministry of the central government. Due to the geographical proximity to Ha Noi and Hai Phong, it is easy to attract teachers and students to the educational facilities here.

Hai Phong

Hai Phong is a port city with a population of around 1.7 million. The city is 102km away from Ha Noi, and is connected with Ha Noi by the Highway No.5. The Highway No.10 is also an important road for the province, linking the city with the Highway No.1 to go to the south. The Province has several big rivers, including Bach Dang, Thai Binh, Cam, Lach Tray and Van Uc rivers, which often interrupt the internal traffic movement. An increasing number of farmers have started producing agricultural products for expanding urban markets as well as for the export markets. Villagers living in the districts along the two highways have good access to both the city and the port, and enjoy favorable conditions to take their products to the city. Those who live in other districts are cut off from the city by the big rivers, and often face problems in transporting their products.

The Provincial People's Committee has been very active in FDI promotion. The Committee has set up a joint venture with a Japanese firm to develop a modern industrial zone in the province, called Nomura-Haiphong Industrial Zone. The provincial authority has also developed a large industrial zone in a small island near the port, called Dinh Vu. Due to the development of such industrial zones, the province has recently attracted a large amount of FDI. The accumulated value of FDI was over US$ 1 billion at the end of 2002. The share of foreign invested sector in the GRP rose from 13% in 1999 to 17% in 2001. The annual growth rate of gross regional product of the province reached 10.4% in that year.

Table 2.2.1.1: Ha Noi at a Glance

Ha Noi

	Ha Noi	Red River Delta	Whole Viet Nam
2001			
Population (th.)	2,842	17,243	78,686
(%)	3.6	21.9	100.0
POVERTY and SOCIAL			
1999			
Poverty	1.5	6.5	13.2
(% of population below poverty line)			
Inequality	9.1	7.0	7.3
(GDP per capita, richest 20% to poorest 20%)			
Urban population (%)	57.6	21.1	23.5
Life expectancy at birth (years)	75.7	73.7	70.9
Infant mortality rate (per th.)	11.0	25.2	33.1
Adult literacy rate (%)	96.9	94.5	90.3
Net primary enrolment rate	95.1	94.1	88.5
Net secondary enrolment rate	72.6	67.4	46.9
Net high school enrolment rate	60.9	41.3	27.3
Doctors per 1,000 (1998)	58	-	-
Nurses per 1,000(1998)	69	-	-
Population without safe water (%)	1.4	7.9	22.9
Population without sanitation (%)	2.8	3.9	16.4
Population without electricity (%)	0.1	1.4	22.9
STATE BUDGET			
1998			
Budget revenues (% of GRP)	45.8	24.4	21.5
Budget expenditure (% of GRP)	9.8	9.4	10.1
Budget balance (% of GRP)	36.4	15.0	11.4
Public education exp.(% of GRP)	2.1	2.6	2.6
Public education exp./total exp.	22.3	27.5	26.0
Public health exp.(% of GRP)	0.4	0.6	0.6
Public health exp./total exp.	4.4	6.1	6.1

KEY ECONOMIC RATIOS

GRP (Gross Regional Product)	1999	2000	2001
GRP (bil.VND, current)	27,039	31,491	35,617
As % of national GDP	6.76%	7.13%	7.35%
GRP per capita (US$)	718	792	834

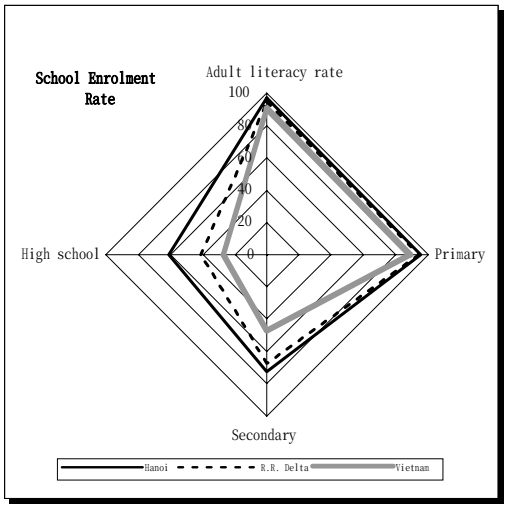
FDI (Foreign Direct Investment)		2002
Accumulated Invested capital (mil.US$)		3,015
Per capita (US$)		1,273

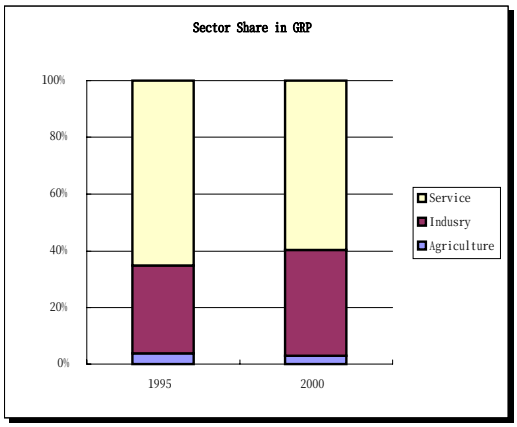
Annual Growth Rate (%,const. price)	1999	2000	2001
GRP	6.0	6.9	9.5
Agriculture	1.2	-5.2	-2.8
Industry	7.6	15.9	10.9

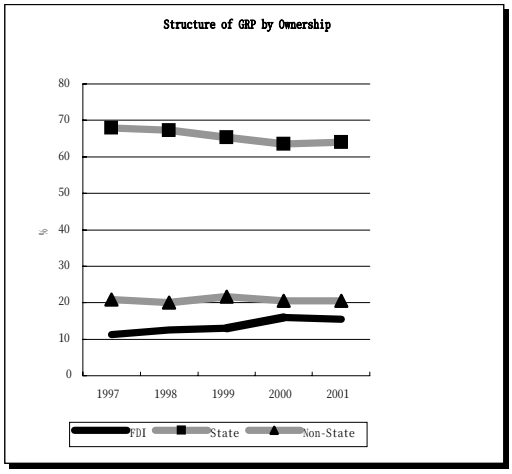
STRUCTURE of the ECONOMY

(% of GRP)	1995	2000
Agriculture	3.8	3.0
Indusry	31.1	37.5
Service	65.1	59.6

(% of GRP)	1999	2000	2001
FDI	13.3	16.3	15.8
State	22.1	21.0	21.3
Non-State	64.6	62.7	62.9







Source: Statistical YearBook of Hanoi, 1998, 2000
Vietnam Human Development Report, 2002
Figures on Social Development in "Doi Moi" period in Vietnam, 2000

Table 2.2.1.2: Hung Yen at a Glance

Hung Yen

	Hung Yen	Red River Delta	Whole Viet Nam
2001			
Population (th.)	1,091	17,243	78,686
(%)	1.4	21.9	100.0
POVERTY and SOCIAL			
1999			
Poverty (% of population below poverty line)	12.8	6.5	13.2
Inequality (GDP per capita, richest 20% to poorest 20%)	6.6	7.0	7.3
Urban population (%)	8.7	21.1	23.5
Life expectancy at birth (years)	72.0	73.7	70.9
Infant mortality rate (per th.)	25.9	25.2	33.1
Adult literacy rate (%)	93.5	94.5	90.3
Net primary enrolment rate	95.2	94.1	88.5
Net secondary enrolment rate	61.0	67.4	46.9
Net high school enrolment rate	32.3	41.3	27.3
Doctors per 1,000 (1998)	28	-	-
Nurses per 1,000(1998)	28	-	-
Population without safe water (%)	6.4	7.9	22.9
Population without sanitation (%)	2.8	3.9	16.4
Population without electricity (%)	2.6	1.4	22.9

STATE BUDGET			
1998			
Budget revenues (% of GRP)	5.2	24.4	21.5
Budget expenditure (% of GRP)	10.4	9.4	10.1
Budget balance (% of GRP)	-5.2	15.0	11.4
Public education exp.(% of GRP)	2.8	2.6	2.6
Public education exp./total exp.	27.4	27.5	26.0
Public health exp.(% of GRP)	0.7	0.6	0.6
Public health exp./total exp.	6.7	6.1	6.1

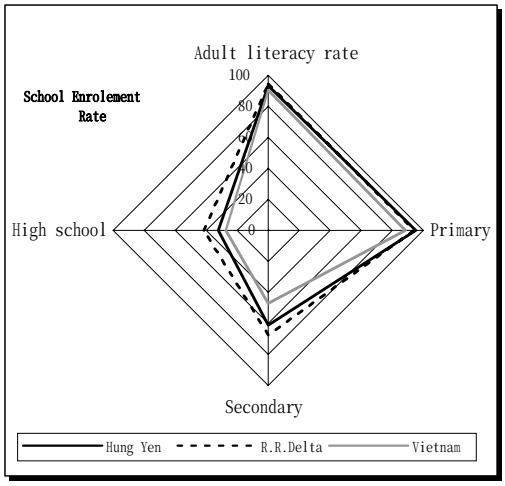
KEY ECONOMIC RATIOS			
GRP (Gross Regional Product)	1998	1999	2000
GRP (bil.VND, current)	3,105	3,632	4,108
As % of national GDP	0.86	0.91	0.93
GRP per capita (US$)	211	242	261

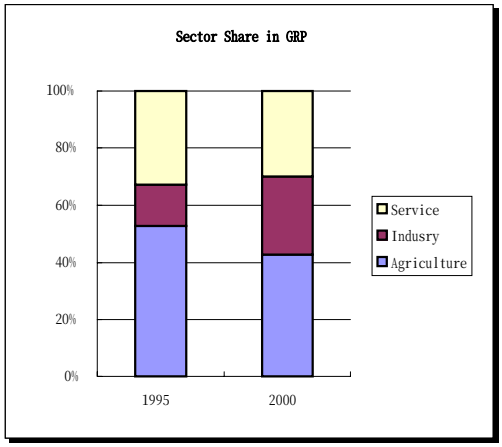
FDI (Foreign Direct Investment)	2002
Accumulated Invested capital (mil.US$)	83
Per capita (US$)	76

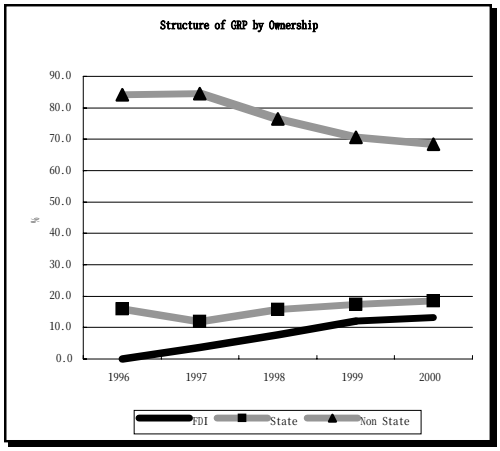
Annual Growth Rate (%,const. price)	1998	1999	2000
GRP	10.2	14.5	11.1
Agriculture	-6.2	4.7	1.9
Industry	31.2	45.3	12.2

STRUCTURE of the ECONOMY		
(% of GRP)	1995	2000
Agriculture	52.7	42.7
Indusry	14.5	27.3
Service	32.7	30.0

(% of GRP)	1998	1999	2000
FDI	7.8	12.1	13.2
State	15.7	17.3	18.5
Non-State	76.5	70.6	68.4







Source: Statistical YearBook of Hung Yen 1998, 2000
Vietnam Human Development Report, 2002
Figures on Social Development in "Doi Moi" period in Vietnam, 2000

Table 2.2.1.3: Hai Duong at a Glance

Hai Duong

	Hai Duong	Red River Delta	Whole Viet Nam
2001			
Population (th.)	1,670	17,243	78,686
(%)	2.1	21.9	100.0
POVERTY and SOCIAL			
1999			
Poverty	5.1	6.5	13.2
(% of population below poverty line)			
Inequality	7.0	7.0	7.3
(GDP per capita, richest 20% to poorest 20%)			
Urban population (%)	13.8	21.1	23.5
Life expectancy at birth (years)	73.7	73.7	70.9
Infant mortality rate (per th.)	26.1	25.2	33.1
Adult literacy rate (%)	94.8	94.5	90.3
Net primary enrolment rate	93.7	94.1	88.5
Net secondary enrolment rate	68.7	67.4	46.9
Net high school enrolment rate	39.2	41.3	27.3
Doctors per 1,000 (1998)	33	-	-
Nurses per 1,000(1998)	38	-	-
Population without safe water (%)	8.7	7.9	22.9
Population without sanitation (%)	0.9	3.9	16.4
Population without electricity (%)	0.8	1.4	22.9

STATE BUDGET			
1998			
Budget revenues (% of GDP)	11.9	24.4	21.5
Budget expenditure (% of GDP)	7.3	9.4	10.1
Budget balance (% of GDP)	4.6	15.0	11.4
Public education exp.(% of GDP)	2.4	2.6	2.6
Public education exp./total exp.	33.3	27.5	26.0
Public health exp.(% of GDP)	0.7	0.6	0.6
Public health exp./total exp.	6.7	6.1	6.1

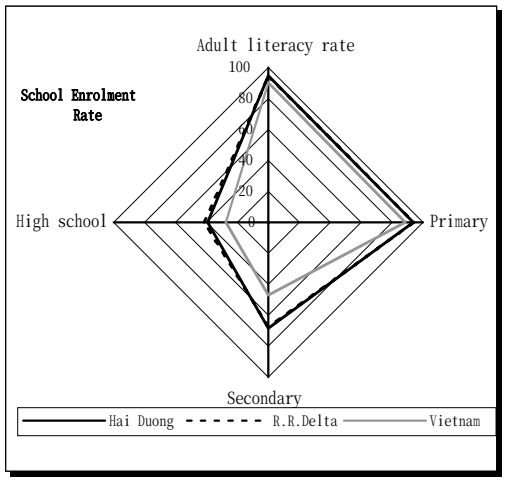
KEY ECONOMIC RATIOS			
GRP (Gross Regional Product)	1999	2000	2001
GRP (bil.VND, current)	5,979	6,175	6,666
As % of national GDP	1.49	1.40	1.38
GRP per capita (US$)	258	256	265

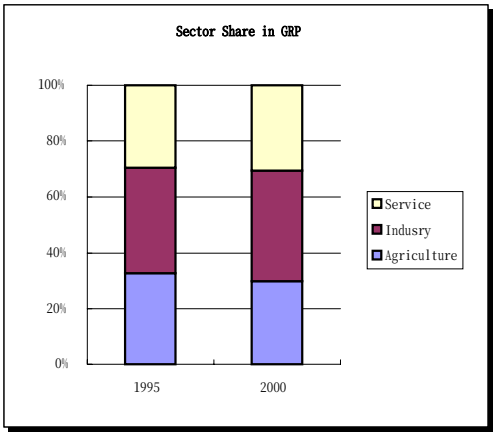
FDI (Foreign Direct Investment)		2002
Accumulated Invested capital (mil.US$)		151
Per capita (US$)		90

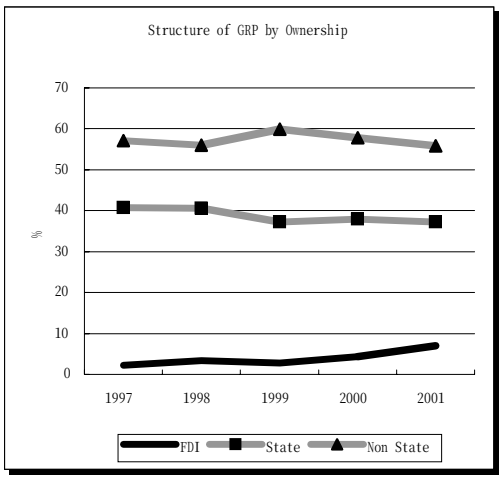
Annual Growth Rate (%,const. price)	1999	2000	2001
GRP	3.8	9.5	8.1
Agriculture	6.0	4.9	4.2
Industry	0.2	16.5	10.5

STRUCTURE of the ECONOMY		
(% of GRP)	1995	2000
Agriculture	32.7	29.9
Industry	37.7	39.4
Service	29.6	30.8

(% of GRP)	1999	2000	2001
FDI	2.8	4.3	6.9
State	37.2	37.9	37.2
Non-State	60.0	57.8	55.8





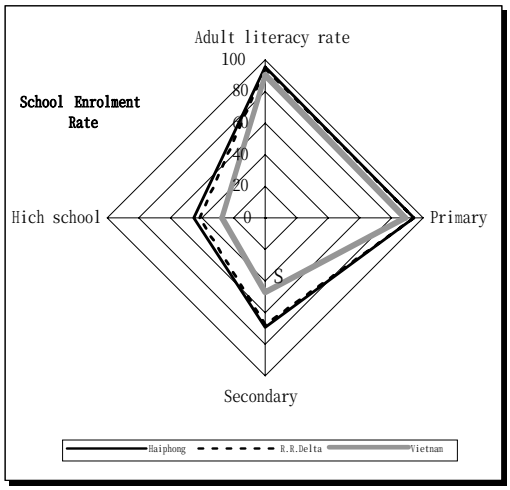


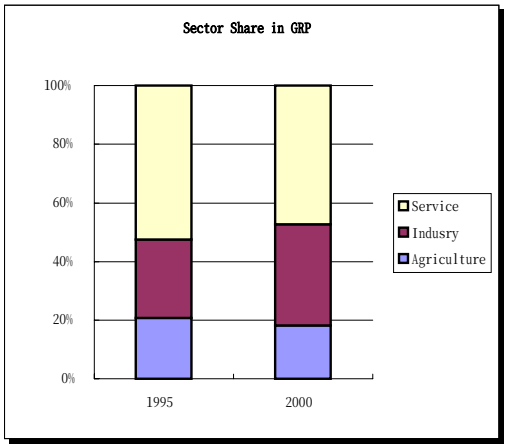
Source: Statistical YearBook of Hai Duong, 1995-2000
Vietnam Human Development Report, 2002
Figures on Social Development in "Doi Moi" period in Vietnam, 2000

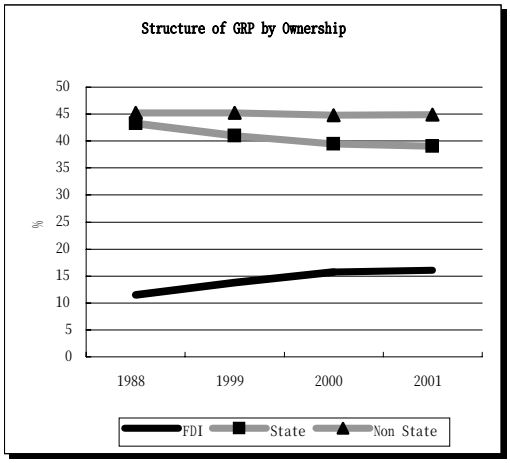
Table 2.2.1.4: Hai Phong at a Glance

Hai Phong

	Hai Phong	Red River Delta	Whole Viet Nam
2001			
Population (th.)	1,711	17,243	78,686
(%)	2.2	21.9	100.0
POVERTY and SOCIAL			
1999			
Poverty	7.3	6.5	13.2
(% of population below poverty line)			
Inequality	7.5	7.0	7.3
(GDP per capita, richest 20% to poorest 20%)			
Urban population (%)	34.0	21.1	23.5
Life expectancy at birth (years)	73.4	73.7	70.9
Infant mortality rate (per th.)	20.8	25.2	33.1
Adult literacy rate (%)	95.4	94.5	90.3
Net primary enrolment rate	94.1	94.1	88.5
Net secondary enrolment rate	69.1	67.4	46.9
Net high school enrolment rate	45.1	41.3	27.3
Doctors per 1,000 (1998)	56	-	-
Nurses per 1,000(1998)	83	-	-
Population without safe water (%)	7.4	7.9	22.9
Population without sanitation (%)	1.8	3.9	16.4
Population without electricity (%)	0.7	1.4	22.9
STATE BUDGET			
1998			
Budget revenues (% of GDP)	31.6	24.4	21.5
Budget expenditure (% of GDP)	8.2	9.4	10.1
Budget balance (% of GDP)	17.1	15.0	11.4
Public education exp.(% of GDP)	2.2	2.6	2.6
Public education exp./total exp.	26.7	27.5	26.0
Public health exp.(% of GDP)	0.5	0.6	0.6
Public health exp./total exp.	6.3	6.1	6.1
KEY ECONOMIC RATIOS			
GRP (Gross Regional Product)	1999	2000	2001
GRP (bil.VND, current)	9,169	10,198	11,506
As % of national GDP	2.29%	2.31%	2.37%
GRP per capita (US$)	367	390	413
FDI (Foreign Direct Investment)		2002	
Accumulated Invested capital (mil.US$)		1,078	
Per capita (US$)		625	
Annual Growth Rate (%,const. price)	1999	2000	2001
GRP	6.3	9.1	10.4
Agriculture	6.8	6.8	3,7
Industry	7.8	16.3	14.9
STRUCTURE of the ECONOMY			
(% of GRP)	1995	2000	
Agriculture	20.9	18.3	
Industry	26.8	34.6	
Service	52.3	47.1	
(% of GRP)	1999	2000	2001
FDI	13.1	15.3	15.6
State	39.7	38.4	37.9
Non-State	43.8	43.5	43.5







Source: Statistical YearBook of Hai Phong, 1998, 2001
Hai Phong 45 year Construction and Development (1995-2000)
Vietnam Human Development Report, 2002
Figures on Social Development in "Doi Moi" period in Vietnam, 2000

2.2.2 Impacts on the regional economic growth

2.2.2.1 Regional comparison in the Red River Delta

Per capita GRP (gross regional product) of provinces in the Red River Delta and some close neighbors shall be presented in the following figures and table. Figure 2.2.2.1 shows the data in 1995, and Figure 2.2.2.2 presents those in 2000. Table 2.2.2.1 describes the original data of the figures. The amounts of per capita GRP for each province are estimated in VND with constant prices of 1994.

Figure 2.2.2.1: Per Capita GRP by Province in 1995

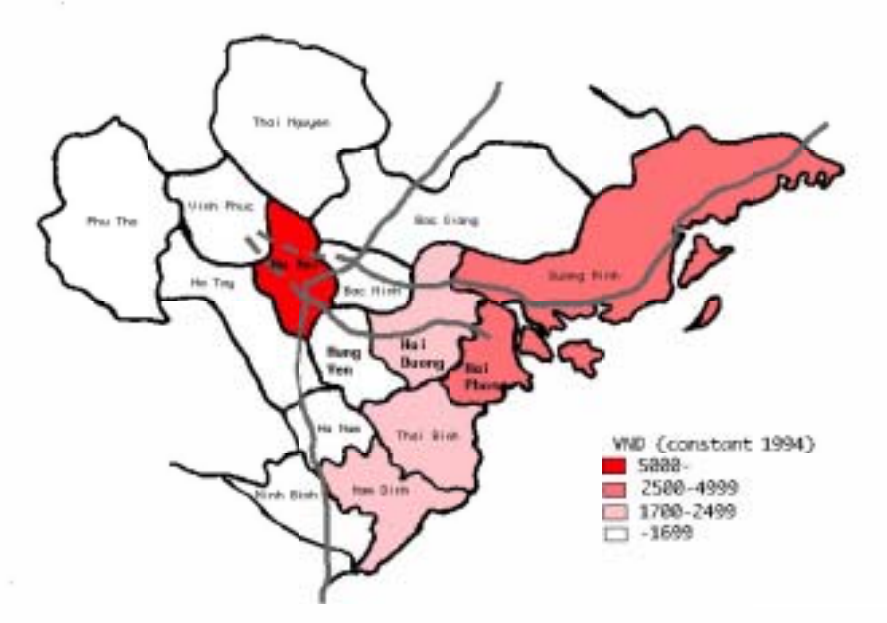


Figure 2.2.2.2: Per Capita GRP by Province in 2000

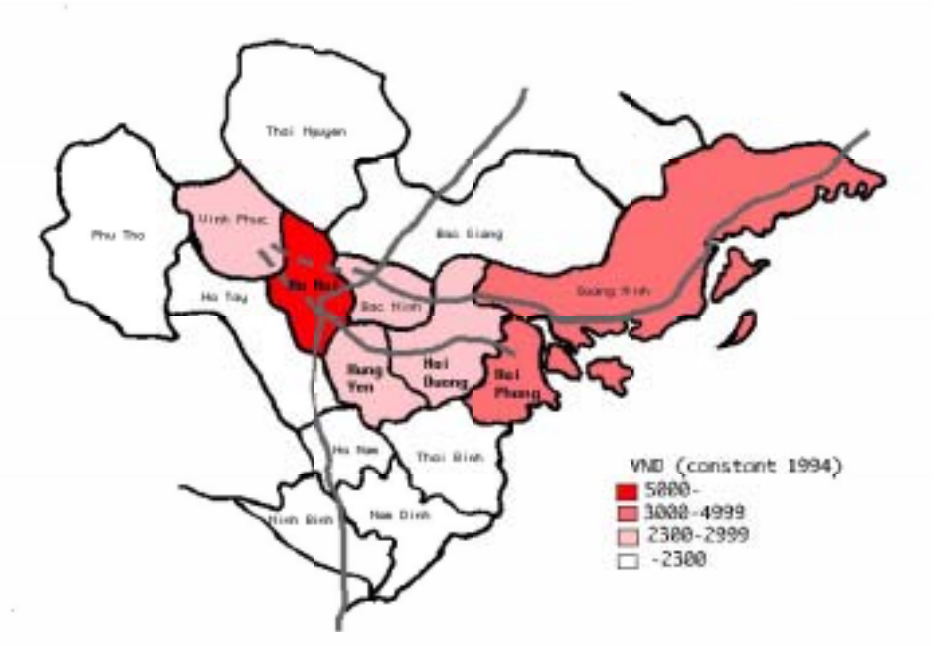


Table 2.2.2.1: Per capita GRP by Province

(VND: constant 1994 price)

	1995	1996	1997	1998	1999	2000
Ha Noi	**5,842**	6,356	6,888	7,287	7,438	**8,066**
Hai Phong	3,511	3,645	3,819	3,881	3,951	**4,222**
Ha Tay	1,638	1,764	1,860	1,930	2,000	2,094
Hai Duong	**2,114**	2,246	2,403	2,577	2,599	**2,775**
Hung Yen	1,609	1,739	1,931	2,079	2,225	**2,313**
Ha Nam	1,601	1,632	1,696	1,793	1,933	2,071
Nam Dinh	**1,755**	1,833	1,898	1,956	2,001	2,100
Thai Binh	**1,821**	1,959	2,108	2,045	2,137	2,189
Ninh Binh	1,358	1,413	1,554	1,611	1,628	1,696
Thai Nguyen	1,600	1,658	1,719	1,686	1,699	1,763
Phu Tho	1,600	1,704	1,825	1,831	1,914	2,034
Vinh Phuc	1,214	1,319	1,550	1,899	1,937	**2,309**
Bac Giang	1,298	1,304	1,398	1,468	1,499	1,598
Bac Ninh	1,510	1,586	1,665	1,768	1,975	**2,332**
Quang Ninh	**2,888**	3,056	3,280	3,296	3,463	**3,635**
Red River Delta	2,643	2,832	3,041	3,181	3,279	3,505
Whole country	2,716	2,923	3,112	3,242	3,346	3,522

Source: Figures on Social Development in "Doi Moi" Period in Vietnam, 2000.

Here are major findings of the examination of the changes in GRP from 1995 to 2000. First, three provinces in the region, which are Ha Noi, Hai Phong and Quang Ninh, had larger GRP than the others throughout the period. The GRP of Ha Noi was extraordinarily high, recording twice as much as the average amount of the Red River Delta. Second, the composition of second highest group changed in this period. In 1995, the coastal provinces, Thai Binh and Nam Dinh, had relatively large values of GRP. Except Ha Noi, most provinces with larger GRP were located on the coast in that year. In 2000, however, the provinces between Ha Noi and Hai Phong came to have larger values of GRP than the coastal provinces. Hung Yen on the Highway No.5 and Bac Ninh on the Highway No.18 are the provinces that significantly increased their GRP in the five years. Vinh Phuc province also had a good road access to Ha Noi and largely expanded its GRP during the period. The comparison of the two figures suggests that the growth center of the Red River Delta shifted from the coastal provinces to those on the east-west corridor between Ha Noi and Hai Phong in the late 1990s. The rehabilitation of the Highway No.5 as well as No.18 and the improvement of the Hai Phong Port might have played an important role in this shift of the growth center.

This observation could be supported by the comparison of the GRP growth rate of the provinces in the region. Figure 2.2.2.4 and Table 2.2.2.2 present the annual average growth rate of GRP from 1995 to 2000. Vinh Phuc Province shows the highest growth rate in this period, followed by Bac Ninh and Hung Yen Provinces. The growth rates of the two coastal provinces, Thai Binh and Ninh Binh, are modest and lower than the regional average. This data also suggests that the growth center in the late 1990s was on the east-west corridor between Ha Noi and Hai Phong.

Figure 2.2.2.3: Growth Rate of Per Capita GRP by Province, Annual average, 1995-2000

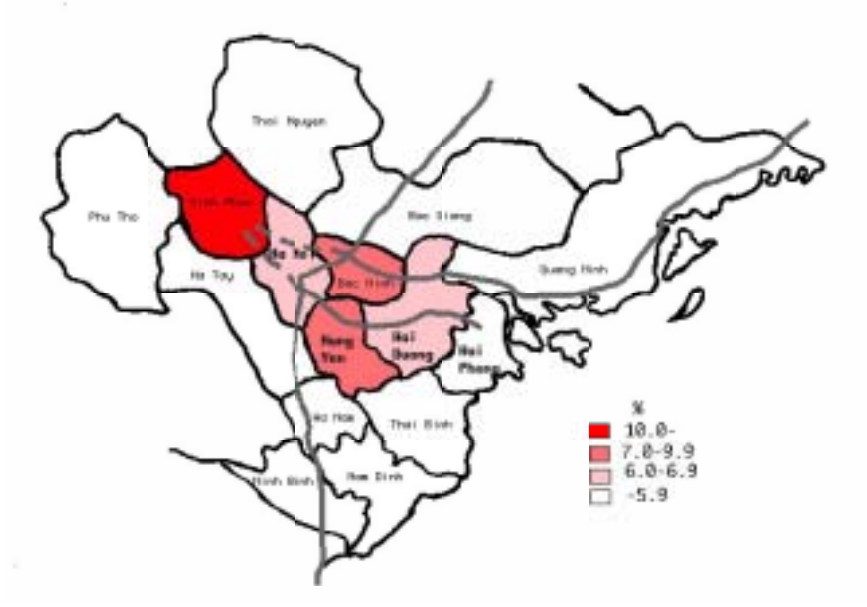


Table: 2.2.2.2: Growth Rate of Per Capita GRP by Province, Annual average 1995-2000

(%: constant price)

Hanoi	**6.9**
Hai Phong	4.2
Ha Tay	5.4
Hai Duong	**6.0**
Hung Yen	**7.6**
Ha Nam	5.7
Nam Dinh	4.1
Thai Binh	4.2
Ninh Binh	5.0
Thai Nguyen	2.3
Phu Tho	5.3
Vinh Phuc	**11.9**
Bac Giang	4.7
Bac Ninh	**8.8**
Quang Ninh	5.1
Red River Delta	6.1
Whole country	5.7

2.2.2.2 Comparison of Hung Yen and Thai Nguyen

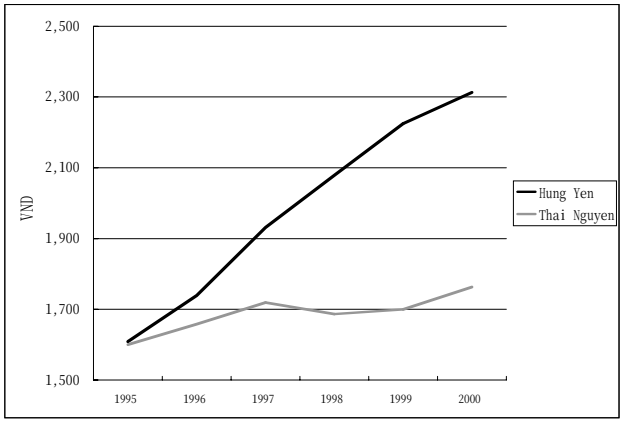
The importance of the transport infrastructure on economic growth might be explained by comparison of Hung Yen and Thai Nguyen Provinces. The two provinces have common features with regards to location and the size of the economy. First, both are very close to Ha Noi (see Figure 2.2.2.4). Thai Nguyen shares the southern border with Ha Noi, and Hung Yen shares the northwest border with the capital city. The population of Thai Nguyen was around 106 million in 2001, almost the same as that of Hung Yen with 109 million. Per capita GRP of the two provinces in 1995 was also similar. Both had around VND 1,600 in constant 1994 prices (see Table 2.2.2.1).

The difference between the two provinces can be found in their economic structure and the access to Ha Noi. Thai Nguyen is the industrialized province in the Red River Delta. The province has rich natural resources such as iron ore, and received a bulk of industrial investments from the state. A large steel plant of Vietnam Steel Corporation is located in the province, for example. The industrial share in GRP was 35% in 1995. The province, however, does not have a good traffic access to Ha Noi despite the proximity. The border between Thai Nguyen and Ha Noi is in a mountainous region. Thai Nguyen town is connected to Ha Noi with the Highway No.3, but its road condition is not comparable with the other newly developed major highways in the Red River Delta. Hung Yen, on the other hand, remains an agricultural province for a long period, without major industrial or commercial investment. The share of industry in GRP was only 15% in 1995, which was the lowest among the provinces in the Red River Delta. Unlike Thai Nguyen, Hung Yen has a good traffic access to Ha Noi, especially after the renovation of the Highway No.5. It takes less than one hour to reach the province from the center of Ha Noi. The Province also has a good connection to Hai Phong Port with this highway.

Figure 2.2.2.4: Location of Hung Yen and Thai Nguyen

The trends of economic growth were very different between the two provinces after 1995 (see Figure 2.2.2.5). As previously pointed out, Hung Yen has a rapid economic growth in the late 1990s. The annual average growth rate of its GRP was 7.6% between 1995 and 2000, which is among the highest in the region. The per capita GRP of Hung Yen reached VND 2,300 in 2000 (in constant 1994 price). The economic growth of Thai Nguyen province was, however, modest with only 2.3% of GRP growth rate during the period. Its per capita GRP in 2000 was only VND 1,700 in 2002, which is among the lowest of all. The changes in structure of GRP are also different between the two provinces (see Table 2.2.2.3). The sector composition of GRP in Thai Nguyen remained unchanged from 1995 to 2000. The share of industry slightly reduced from 35% to 30% during the period. The agricultural share rose by 5%, instead. In Hung Yen province, however, the share of industrial sector increased sharply from 15% to 27% in five years. That of agriculture was significantly reduced by 10% in the period. Hung Yen Province had a dramatic change in its economic structure within such a short period.

Figure 2.2.2.5: Per Capita GRP of Hung Yen and Thai Nguyen
(constant 1994 price)



Source: Table 2.2.2.1

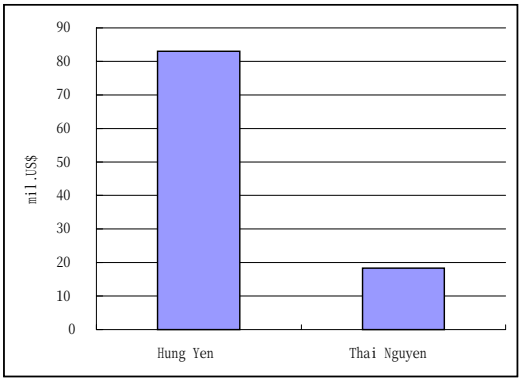
Table 2.2.2.3: Sector Composition of GRP in Hung Yen and Thai Nguyen

(%)	1995	1996	1997	1998	1999	2000
Hung Yen						
Agriculture	53	56	46	45	43	43
Industry	15	15	22	24	29	27
Service	33	29	32	30	29	30
Total	100	100	100	100	100	100
Thai Nguyen						
Agriculture	30	32	31	33	35	35
Industry	35	34	34	33	30	30
Service	36	34	35	35	35	35
Total	100	100	100	100	100	100

Source: Figures on Social Development in "Doi Moi" Period in Vietna

It is safe to say that the good road access of Hung Yen to Ha Noi and to Hai Phong Port does effect the economic growth of the province in the last few years. The improvement of the Highway No.5 and Hai Phong port should be at least two of the important factors to boost the economic growth of the province. The third chapter of this report shall explain the processes of economic growth stimulated by the improvement of transport infrastructure. However, a quick look at the amount of FDI (foreign direct investment) to Hung Yen and Thai Nguyen would tell us one factor to explain the different economic performances of the two provinces (see Figure 2.2.2.6).

Figure 2.2.2.6: Invested Capital of FDI to Hung Yen and Thai Nguyen, 1993-2002



Source: MPI

2.2.3 Impacts on poverty reduction

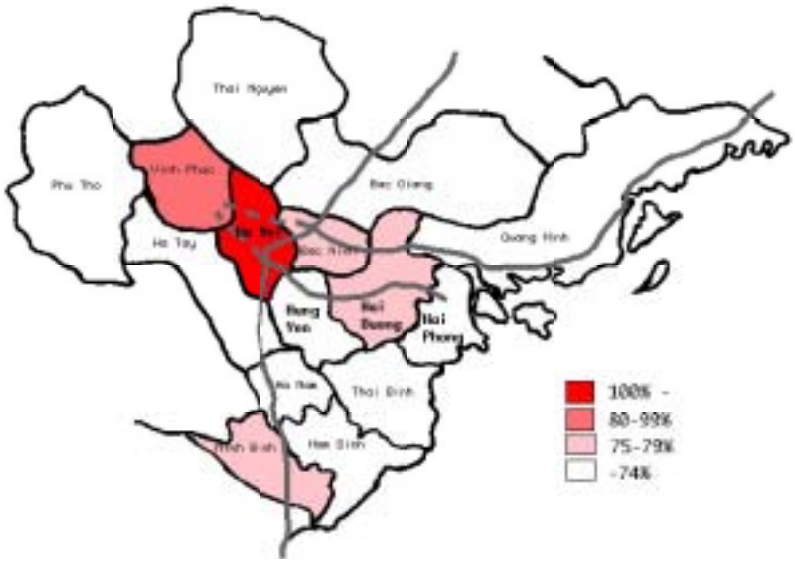
The impact of the transport infrastructure on poverty reduction shall be examined from the two viewpoints. Firstly, the changes in poverty levels of the provinces in the Red River Delta shall be examined on the basis of the national statistics about the household poverty. Secondly, the poverty levels of the communes in the two provinces along the Highway No.5 shall be compared.

2.2.3.1 Regional comparison in the Red River Delta

As previously examined, the improvement of transport infrastructure should have played an important role in the economic growth of the provinces in the region concerned. It is expected that the renovation of the Highway No.5 and Hai Phong Port should also make significant contribution to poverty reduction in the provinces nearby. Figure 2.2.3.1 shows the rate of reduction in the number of poor households (HH) by province from 1998 to 2000. The data of these figures are illustrated in the attached table.

The poverty reduction was most significant in Hanoi, in which the number of poor households deceased by 157% within three years. In Ha Noi poor households represented only 2.3% in 1998, and sharply fell to 0.8% in 2000. Vinh Phuc province also reduced the number of poor households considerably in this period. In 1998,Vinh Phuc was among the poorest provinces in the region, where18% of households was considered poor. In the following three years, however, the number of poor households dropped by 85% and the share of poor households was only 8.5%. Other provinces, such as Bac Ninh, Ninh Binh and Hai Duong provinces, also lessen the share of poor households to a large extent in the late 1990s. It is interesting that four of these five provinces where poverty was dramatically reduced are located in the growing east-west corridor. The recent rapid economic growth in these provinces might have provided a variety of opportunities for poor households to raise their income. The improvement of the Highways No.5 and No.18 should have contributed to the poverty reduction in the concerned provinces by stimulating the economic growth.

Figure 2.2.3.1: Reduction in the Number of Poor HH from 1998 to 2000 (%)



Source: Table 2.2.3.1

A notable exception is Hung Yen province where 11% of the households were still regarded poor in 2000. The rate of reduction of poor households in three years was only 30%, which is lower than the regional average. This suggests that the economic growth might not be the only factor to effect the poverty reduction, or that it might take a long time until the benefits of economic growth shall result in poverty reduction.

Table 2.2.3.1: Change in the Number of Poor HH by Province

	Ratio of poor HH (%)			Total No. of HH	No. of poor HH			Reduction in No of poor HH (%)
	1998	1999	2000	1999	1998	1999	2000	1998-2000
Ha Noi	2.34	1.47	0.84	581,000	12,950	8,538	5,036	157
Hai Phong	11.07	7.28	5.85	406,000	41,180	29,569	24,560	68
Ha Tay	7.66	5.83	4.43	480,000	37,700	28,000	22,000	71
Hai Duong	6.83	5.08	3.58	408,000	26,650	20,724	15,124	76
Hung Yen	12.16	12.76	10.53	214,000	30,315	27,315	23,315	30
Ha Nam	12.58	11.61	9.29	190,000	22,205	22,067	18,267	22
Nam Dinh	10.23	7.42	6.46	480,000	44,000	35,597	32,097	37
Thai Binh	7.66	7.01	5.85	470,000	29,500	32,950	28,450	4
Ninh Binh	13.69	9.30	6.97	215,500	27,660	20,040	15,540	78
Thai Nguyen	13.45	10.93	8.72	210,000	28,515	22,956	18,956	50
Phu Tho	25.57	16.39	13.97	285,000	67,245	46,716	41,216	63
Vinh Phuc	17.88	11.42	8.51	230,000	37,500	26,266	20,266	85
Bac Giang	20.85	13.91	11.53	330,000	63,000	45,893	39,393	60
Bac Ninh	12.23	8.27	5.99	217,500	24,000	17,994	13,494	78
Quang Ninh	17.90	13.01	10.64	210,000	34,010	27,326	23,126	47
Red River Delta	8.57	6.91	5.61	3,892,000	336,660	269,060	218,160	54
Whole country	15.66	13.03	10.64	15,884,100	2,387,050	2,069,916	1,749,616	36

Sources: Statistics of Agriculture and Rural Development 1996-2001

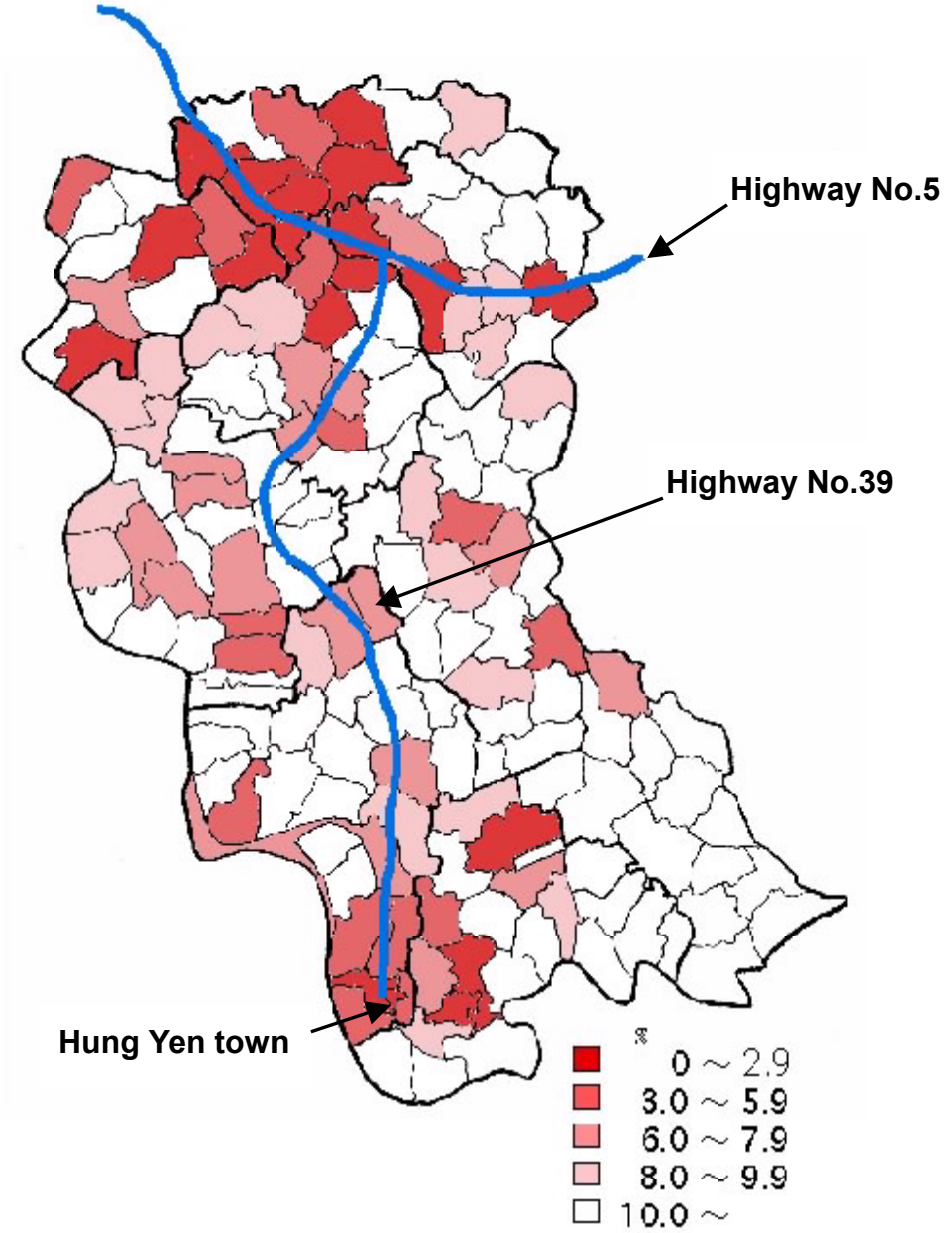
2.2.3.2 Comparison of Poverty at Commune Level in Hung Yen and Hai Duong

The impact of transport infrastructure on poverty reduction shall be examined by comparing the poverty level in all communes in Hung Yen and Hai Duong provinces which are located along Highways No.5 and No. 18. It is assumed that the people living in communes near the highways should have better access to cash income than those living far from the highways in the same provinces. Two indices are used to examine the different income levels, namely (i) the share of poor households in 2002, or (ii) the average household income in 2002. The information was obtained from the statistical database of the Ministry of Agriculture and Rural Development.

Figure 2.2.3.2 presents the outcome of the analysis for communes in Hung Yen. It shows the share of poor households in 2002. Those communes that have fewer poor households are painted with a darker color. And communes whose share of poor households is over 10% are colored white. Two lines are the major roads, which are Highway No.5 and the Highway No. 39. Highway No.39 connects Highway No. 5 and Hung Yen Town in the south. This map tells us that those communes located on Highway No. 5 as well as in Hung Yen town have relatively fewer poor households. In many of the communes on the highway, the share of poor households was less than 3 %. The communes near Hung Yen town also have relatively small number of poor households. It is assumed that the improvement of the Highway No.5 might have created various economic opportunities, and contributed to the poverty reduction in the communes nearby.

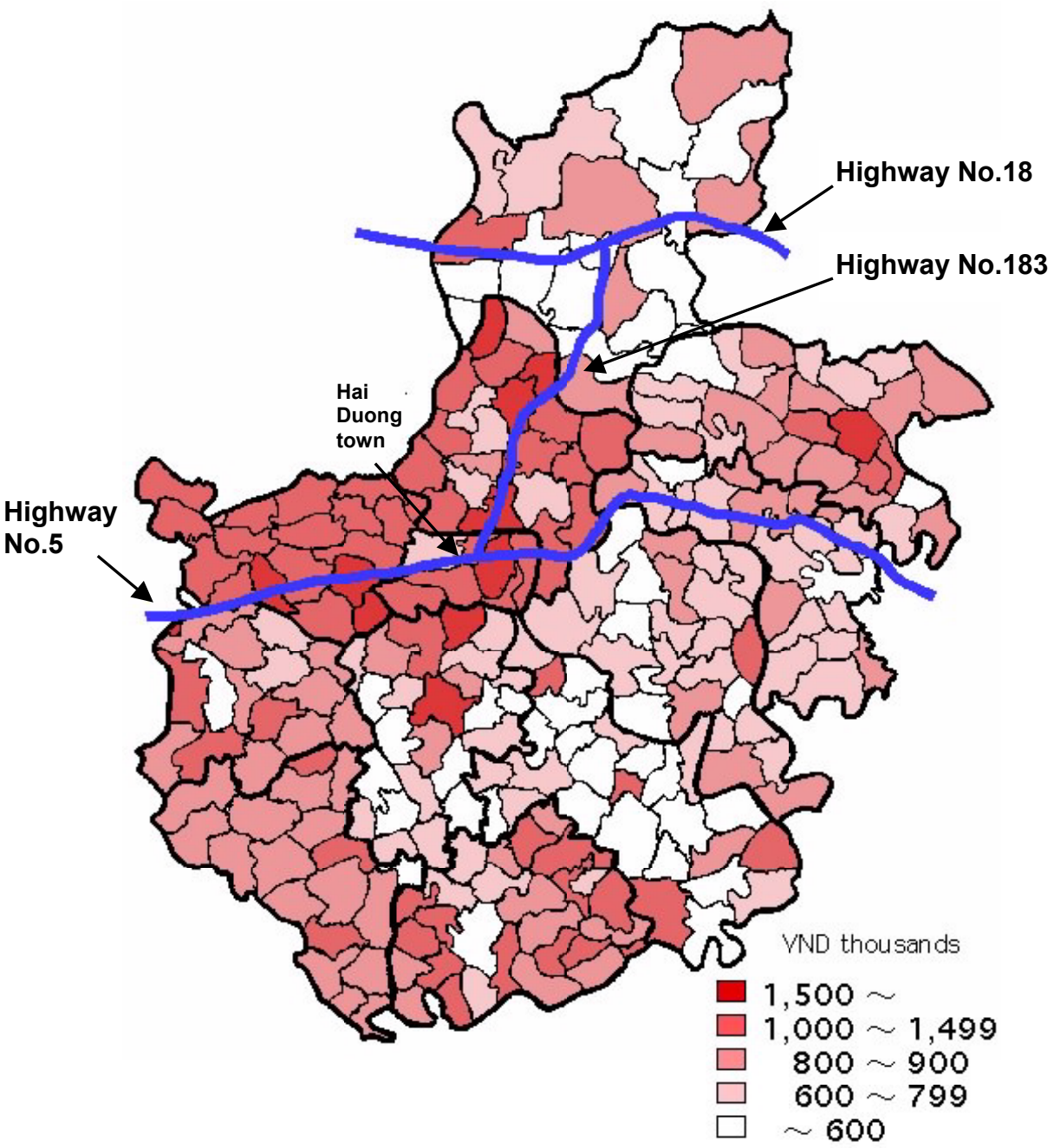
Figure 2.2.3.3 shows the comparison of the average income of communes in Hai Duong Province. Communes with higher average household income are colored with darker colors. Communes with lower average household income are illustrated with lighter colors. The horizontal line at the center of the province is Highway No.5. Another line in the north is Highway No. 18. The connecting vertical line indicates Highway No. 183. Hai Duong Town is in the center of the province along Highway No.5. This figure presents a similar result as the previous map of Hung Yen. Those communes located on Highway No.5 have higher average income. In many of the communes along this highway, the average household income is over VND 1 million. Many of the wealthy communes are located to the north west of the province near the three highways.

Figure 2.2.3.2: Hung Yen, Share of Poor HH in 2002 (%)



Source: Ministry of Agriculture and Rural Development

Figure 2.2.3.3: Hai Duong, Average HH Income in 2002



Source: Ministry of Agriculture and Rural

3. Process for the Impact

3.1 Analytical Framework

A form of public transport serviceat Hai Duong Town

3.1.1 Two Aspects of the Impact

The rehabilitation of Highway No.5 and Hai Phong Port has made a great impact on the local economy and society. The provinces along the highway had a rapid economic growth in the late 1990s, and these provinces significantly reduced the number of poor households as well. This part of the report focuses on the process of how the improvement of the transport infrastructure contributed to the economic growth and poverty reduction in the provinces concerned. Two aspects of the impact shall be examined. The first aspect is related to foreign investment. It is assumed that the regional economic growth and poverty reduction should have been realized by the recent massive inflow of FDI to these provinces. The second aspect is the socio economic development in the rural villages in the provinces along the highway. The improvement of transport infrastructure might have stimulated the rural economic activities and generated additional income for the villagers. These two aspects are described with figures in the following sections.

3.1.1.1 Economic Aspect

It is assumed that the rehabilitation of the large-scale transport infrastructure, Highway No.5 and Hai Phong port, caused the massive inflow of foreign direct investment, and consequently contributed to the growth of the regional economy and local poverty reduction. The framework of this assumption is described in Figure 3.1.1.1.

The two infrastructure projects played a significant role in attracting FDI to this region. Many of foreign enterprises would not have come to the provinces along the highway unless the two projects had not implemented. The increase in FDI in the region has resulted in the rapid growth of the local economy, and the substantial reduction of poor households in the society. This contribution of FDI to the process of economic growth and poverty reduction should be explained with the following process.

- Increase in industrial production and trade
- Creation of factory employment
- Expansion of supporting business
- Procurement of local inputs
- Fiscal contribution

The next section of the report shall identify these processes with quantitative data and evidences. The results of survey of about eighty foreign and domestic enterprises are used to illuminate the process. Both managers and employees of these enterprises were interviewed with questionnaires so as to examine the impact of the two infrastructure projects. The methodology of the foreign enterprises survey is presented in 3.1.2.

Even though the two projects played an extremely important role in attracting FDI and are causing economic growth and poverty reduction, several concurrent interventions and some surrounding factors should also be important factors in the process. These factors include the followings.

- Good labor force with low wages
- Expansion of vocational training programs
- Establishment of industrial zones
- Administrative incentives to promote FDI
- Fierce global competition
- Strong political will to fight against poverty

These external factors and concurrent interventions shall also be examined with the data and evidence obtained from foreign enterprises survey.

3.1.1.2 Socio economic aspect

The benefit of the improvement of the Highway No.5 and the Hai Phong port is not limited to the promotion of FDI. The rural villages in the provinces along the highway have received a significant impact from the projects. Rural economic activities have been much stimulated, and the structure of the

economy has been significantly changed. The changes shall be explained with the following process.

- Diversification of agricultural production
- Move to higher valued crops
- Wider opportunities of non-farm business
- Better access to social infrastructure

The roles of these factors in achieving the growth and poverty reduction in the region are described in Figure 3.1.1.2.

It is no doubt that the improvement of large transport infrastructure alone cannot lead to such changes in rural society. Several concurrent interventions and some surrounding factors are also necessary, including the followings.

- Development of feeder road network in the provinces
- Development of public transport service in the provinces
- Growing urban markets
- Expansion of agricultural extension services
- Good access to agricultural credit

The results of the two surveys shall also be used to examine the role of these external factors.

Figure 3.1.1.1: Economic Aspects of Impact

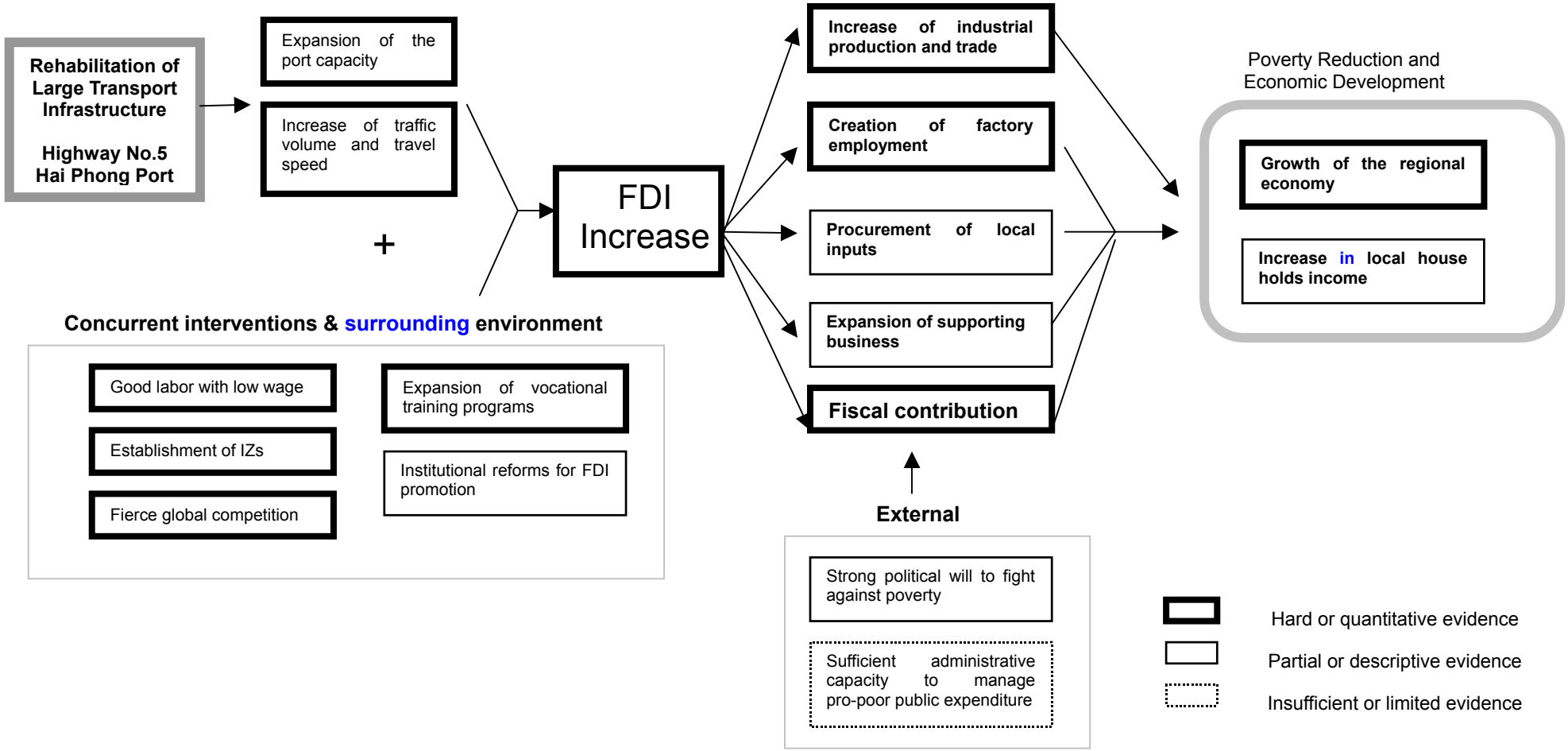
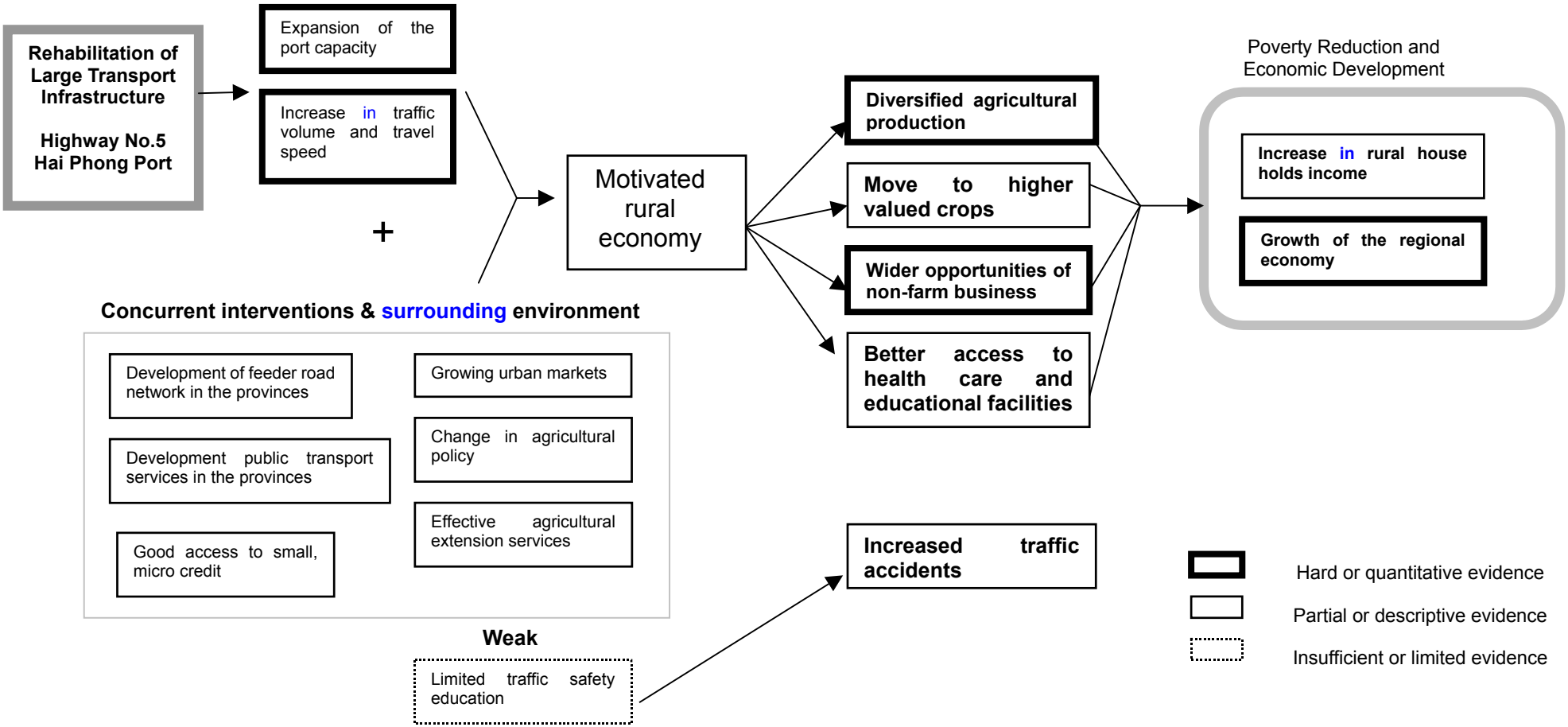


Figure 3.1.1.2: Socio-Economic Aspects of Impact



3.1.2 Framework of FDI survey

3.1.2.1 Interview Survey of FDI Managers

Interview survey of about eighty foreign and domestic enterprises was implemented from February to April 2003, so as to obtain updated information about the operation of FDI, as well as the views on the recent improvement of transport infrastructure. Many of the surveyed FDIs locate along or near Highway No.5. In most cases, the study team members directly asked questions to managers of enterprises. The discussed points at the surveyed and the profile of the companies are shown in the following tables.

Table 3.1.2.1: Discussed issues at Company survey

(1) Corporate profile
- Year of investment
- Line of business
- Equity structure
- Corporate size: paid-up capital, number of employee and turnover
- Business territory
- Main product by business line and their sales volume
- Organization chart and management style
- Employee in each section or department by local and Japanese people

(2) Reasons for investment
- The reason why the parent company selected Vietnam
- Investment in neighboring countries and the significance of the investment to Vietnam
- The reason why the parent company selected the current site among many candidates
- Competitiveness of Vietnam as investment climate visa-v other countries
- Competitiveness of the site as investment climate visa-v other sites
- Evaluation of Vietnam's investment policy and investment incentives
- The importance of infrastructure development in the parent company's decision making on investment
- Evaluation on the improvement of economic infrastructure such as road-port-electricity and water supply
- Evaluation on the improvement of the social infrastructure such as health care or education

(3) Corporate strategy
- Business strategy and site selection strategy
- Product development strategy and product concept
- Manufacturing strategy and manufacturing concept
- Export strategy
- Distribution strategy and distribution channel
- Recruitment strategy
- Financial strategy
- Management strategy

(4) Current operation
- Factory layout: area, production line and main equipment
- Work environment: work hour, shift, wage and fringe benefit
- Regulation on working condition
- A flow of production for a major product from procurement of raw material to cash recovery
- Type of production: production on order or stock
- Flow of raw materials and products : frequency, packages, routes and transportation mode
- Productivity and loss rate
- Outlet: domestic market and export market
- Distribution channel: direct sales or sales through agents
- Cash recovery: terms and conditions of sale
- R&D: number of employee engaged, budget, priority areas and the parent company's support
- Profitability
- Major issues the company faces and their solutions

(5) Recruitment of employees
- Origin of employee, neighboring area, other regions in Vietnam, and neighboring Asian Countries
- Way of recruitment
- Working condition: wage, holiday and fringe benefit
- Basic policy for human resource development
- Consideration on recruitment from poverty areas
- Profile of employee : by sex, by age, and by education level achieved

(6) Business expansion plan
- Business strategy: Develop new markets for existing products and develop new products for existing markets
- New investment plan: year, scale and the reason for expansion

Table 3.1.2.2: List of Foreign and Domestic Companies Surveyed

No.	Year	Nation	Name of Company	Products	Location
1	1991	Taiwan/Vietnam	Tan Thuan Corp.	Industrial zone development	Tab Thuan IZ, HCMC
2	1993	Switzerland	Tropical Wave Corporation	Drinking water	Hai Duong
3	1994	Japan/Hai Phong City	Nomura-Hai Phong Industrial Zone Development Corp.	Industrial zone development	Nomura-Hai Phong IZ
4		Japan	NIDECTOSOK	Automobile parts and fan	Tan Thuan IZ,HCMC
5		Vietnam	Vietnam National Cement Corp.	Cement	Hanoi
6		Panama	BVT&Co	Garments	Hai Duong
7	1995	Malaysia/Vietnam	Noi Bai Development Corporation ,Ltd	Industrial zone development	Noi Bai IZ
8		Japan	Pentax Vietnam Co., Ltd	Components of camera	Saidon B IZ
9		Japn/Vietnam	Ebadra hai Duong Co., Ltd	Pumps used for irrigation, flood control and industries	Hai Duong City
10		Japan/Vietnam	Jina - Shiroki Co., Ltd	Mold and dies	Thanh Xuan District
11		Korea/Vietnam	Han-Viet Heavy Industry& Construction Corp.	Metal structure	Hai Phong
12		Japan	Tsukuba Diecasting Vietnam Co., Ltd	Aluminum-made diecastings	Sai dong B IZ
13		Philippines Vietnam/ Japan	San Miguel Yamamura Hai Phong Glass Co., Ltd	Glass containers	Hai Phong
14		Taiwan	Taiwan Hanoi Industrial Park Development Corporation	Industrial park development	Gia Lam district
15		Japan	Nishishiba Vietnam	Power supply	Nomura-Hai Phong IZ
16		Japan	HOP THINH Co., Ltd	Manufacture of uniform	Nomura-Hai Phong IZ
17		Japan	Honda Vietnam	Motor cycle	Vinh Phuc Province
18		Japan	Dragon Logistics	Distributor	Thang Long IP
19		Japan	Vietnam Stanley Electric Co., Ltd	Lamps for automobile and motorcycle	Gia Lam District
20		Japan	Rorze Robotech Inc.	Semiconductor manufacturing equipment	Nomura-Hai Phong IZ
21		Japan/Vietnam	Sumi-Hanel Wiring Systems Co., Ltd	Wiring systems for automobile	Sai dong B IZ
22		Japan/Vietnam	INAX-GIANG VO Sanitary Ware Vo.,Ltd	Sanitary ware	Gia Lam District
23		Japan/Vietnam/Singapore	Toyota Vietnam Co., Ltd	Automobile	Vinh Phuc
24		Vietnam	Viet A Co., Ltd	Mechanical products	Pho Noi , Hung Yen
25		Vietnam	Cong Ty Hoa Chat	Interior steel products	Hung Yen
26		Vietnam, Singapore and Italy	Vietcans J.V Co., Ltd	Cans for canned vegetables and fruits	Hai Duong city
27	1996	Japan/Vietnam	Vietnam Float Glass Co., Ltd	Float sheet glass	Bac Ninh Province
28		Vietnam	Cong ty Giay Thuan Thanh	Shoes	Hung Yen
29		Japan/Vietnam	The Long Binh Techno Park Corporation	Industrial zone development	Long Binh Techo Park, Dong Nai
30		Korea/Vietnam	Daewoo-Hanel Corporation	Industrial zone Development	Saidong A IZ
31		Japan	NIKISSO VIETNAM MFG Co., Ltd	Blood tubing sets	Tan Thuan IZ, HCMC
32		Taiwan	Wonderful Foods Co., Ltd	Food	Cam Gian district, Hai Duong
33	1997	USA/Vietnam	Ford Vietnam Ltd.	Automobile	Hai Duong
34		Singapore/Thailand/Japan/ Vietnam	Inoue Rubber Vietnam Co., Ltd	Motorcycle tire & tube, Cart tire & tube, Industrial rubber goods	Vinh Phuc Province
35		Taiwan	Chin Huei Plastic Industrial Co., Ltd	Plastic pipe and ceiling panel	Hai Phong
36		Japan	AS'TY Vietnam	Handbag	Nomura-Hai Phong IZ

37		Vietnam	Hanoi Electronics Corp.-Saidong B Industrial Zone Management Unit	Developer of industrial zone	Saidong B IZ
38		Japan	Vietnam Steel Products	Steel pipe for motorcycle	Noi Bai IZ
39		Japan	Nissin Brake Vietnam Co., Ltd	Brake system for motor cycle	Binh Xuyen, Vinh Phuc
40		Japan/Vietnam	Thang long Industrial Park Corp.	Developer	Thang Long IP
41		Thailand, Vietnam and Laos	GMN. J.V Co., Ltd	Motorcycle parts	Hung Yen
42		Japan	Mitsuba M-Tech Vietnam Co., Ltd	Motorcycle parts	Long Binh Techno Park, Dong Nai
43		Japan	Harada Industries Vietnam Ltd.	Antenna for car radio	Long Binh Techno Park,Dong Nai
44		Japan/Vietnam	Goshi- Thang Long Auto-Parts Co.,Ltd.	Parts of motorcycle	Gia Lam District
45	1998	Vietnam	LiOA Electric Wire & Cable Factory	Wire & cable	Hung Yen
46		Korea/Vietnam	LG-MECA Electronics Inc.	Electrical home appliances	Hai Phong
47	1999	Taiwan	Fu Lin Plastic Industry Co., Ltd	Plastic leather and sheet for shoed and furniture	Hai Phong
48		Japan	Hi-Lex Vietnam	Control cable for motor cycle	Nomura-Hai Phong IZ
49	2000	Vietnam	Yen Son Co., Ltd	Wood products	Hanoi-Gia Lam
50		Korea	TAE YANG VINA CO., LTD	Table ware	Hung Yen
51		Vietnam	T&T Hung Yen Co., Ltd	Motorcycle parts	Hung Yen
52		Japan	Parker Processing Vietnam Co., Ltd	Surface treatment	Thang Long Ip
53	2001	Japan	Mitsubishi Pencil Vietnam Co., Ltd	Color pencil	Thang Long Ip
54		Japan	Canon Vietnam	Laser beam printer	Thang Long IP
55		Japan	TOA Vietnam	Switcher for security camera	Thang Long IP
56		Japan	Denso Manufacturing Vietnam	Air intake components	Thang Long IP
57		Singapore	Volex	Power cord for printer	Thang Long IP
58		Japan	Yazaki Hai Phong Vietnam	Wire harness for automobile	Nomura-Hai Phong IZ
59		Japan	ABE Asian Tech Hanoi	Printing	Thang Long IP
60		Japan	Sumitomo Bakelite Vietnam Co., Ltd	Flexible printed circuit board	Thang Long IP
61		USA	PV Hai Phong Inc.	Assembling of gas table	Nomura-Hai Phong IZ
62		Vietnam	DETECH	Motorcycle	Hung Yen
63		Vietnam	Viet Tung	Assembling of agricultural machinery	Binh Gaing district, Hai Duong
64	2002	Japan	Estell Vietnam Co., Ltd	Jeswerly	Nomura-Hai Phong IZ
65		Vietnam	Cong Ty CPTP Thien Hong	Snack noodle	Hung Yen
66		Malaysia	Santomas Vietnam	Components of printer	Thang Long IP
67		Japan	TOTO Vietnam	Sanitary ware	Thang Long IP
68		Japan	Fujikin Vietnam	Valve for semi- conductor manufacturing equipment	Thang Long IP
69		Taiwan	Taiwan Fong Tai Paper Co,. LTD	Carton Box	Nomura-Hai Phong IZ
70		Japan	Hiroshige Vietnam Corp.	Video Drum	Nomura-Hai Phong IZ
71		Japan	Fuji Mold Vietnam Co., LTD	Plastic mould for Canon and Pentax	Nomura-Hai Phong IZ
72		Japan	Sakurai Vietnam LDT.	Metalworking machine and auto parts	Thang Long IP
73		Japan	Matsuo Industries VN.Inc.	Plastic molding parts and steel processing parts for automobiles and others	Thang Long IP
74		Japan	Yabashi VN CAD Technology Corp.	Designs, design processing and software products	Thang Long IP
75		Japan	Kayaba Vietnam Co., Ltd	Suspension for motorcycle	Thang Long IP
76		Korea	Global Sourcenet	Garments	Hung Yen
77		Taiwan	Formostar	Garments	Hai Duong
78		USA	Tung Kuang Co., Ltd	Aluminum products	Hai Duong
79	-	Thailand(Japan)	Nippo Mechatoronics (Vietnam) Co., Ltd	Plastic mold for AV, OA equipment	Noi Bai IZ
80	-	Korea	Kotra, Hanoi	Trade and Investment Bureau of Korea	Hanoi
81		Taiwan	Taipei economic & Cultural Office in Hanoi	Trade and Investment Bureau of Taiwan	Hanoi

3.1.2.2 Questionnaire Survey of Employees at FDI

Questionnaire survey of employees at foreign enterprises was implemented from February to March 2003, in addition to the interview survey with the manager of these enterprises. The objective of this survey was to examine the significance of wage employment in family income of the employees. Main issues on the questionnaire are shown in Table 3.1.2.3.

Table 3.1.2.3: List of Items for Employee survey

(1) Employee's profile
- Sex
- Age
- Education level achieved
- Origin of birth
- Status in family
- Family member

(2) Type of work in the company

(3) Income level
- Before employment by the company : source of income and income level
- After employment by the company : source of income and income level

(4) Changes in the life style
- Household expenditure : Engel co-efficient
- Leisure time and its spending pattern
- Expenditure on education
- Role in family
- Two income family

The total number of questionnaires collected is 240. The features of the respondents are shown in table 3.1.2.3. Many of the employees for the survey are working at one of major industrial zones in Ha Noi or Hai Phong. Half of them are working in factories, and the remaining are administrative or managerial staff. These employees are mostly highly educated with the background of higher or vocational education. The previous job experience of the employees is various. Some were engaged in handicraft manufacturing, and others were working in trading or service business. Five percent of them used to be government employees.

Table 3.1.2.4: Features of Respondents of the Questionnaire Survey

(1) Industrial Zones employed		
Thang Long	87	36%
Sai Dong	20	8%
Noi Bai	12	5%
Nomura Hai Phong	63	26%
Others	58	24%
Total	240	100%

(2) Academic Background		
Secondary school	9	4%
High school	66	28%
Vocational school	34	14%
Higher education	113	47%
Others	18	8%
Total	240	100%

(3) Current Position		
Factory worker	102	43%
Factory supervisor	9	4%
Administrative staff	76	32%
Manager/professional staff	43	18%
Others	10	4%
Total	240	100%

(4) Means of commuting		
Bicycle	45	19%
Motorbike	94	39%
Mini bus	74	31%
Foot	13	5%
Others	14	6%
Total	240	100%

(5) Previous Job experience		
Farming	1	0%
Handicraft	10	4%
Factory employment	26	11%
Trade & Services	10	4%
Government employee	13	5%
Others	47	20%
No experience	10	4%
No answer	123	51%
Total	240	100%

3.1.3 Framework of Socio Economic Surveys

3.1.3. Rural Households Surveyed in Hung Yen and Hai Duong Provinces

(1) Procedures

The survey is based on the household interviews in rural areas in Hung Yen and Hai Duong provinces. The two provinces are chosen because they have a large rural area, which was largely effected by the upgrade of Highway No.5.

The number of surveyed households is around 200, which are located in 6 communes in the provinces. These communes are selected from both of the following types.

a) Those largely effected by the improvement of the highway
b) Those little effected by the improvement of the highway

Due to the advice of the provincial authority, five communes were finally selected from the largely effected area, and one was from relatively unaffected area. Within communes, sample households are selected from both poor and non-poor income groups. Communes for the survey are shown in the following table.

Table 3.1.3.1: Selected Communes for the Case Study

	Province	District	Commune	Remarks
1	Hai Duong	Cam Gang	Cam Doai	Alongside HW5
2		Kim Thanh	Lai Vu	Alongside HW5
3		Ninh Giang	An Duc	Away from HW5
4	Hung Yen	Van Lam	Dinh Du	Alongside HW5
5		My Hao	Ban Yen Nhan	Alongside HW5
6		Yen My	Giai Pham	Alongside HW5

After the initial interview survey in February 2003, the questionnaire was finalized. The basic points of the questionnaire are the followings.

1. Profile of respondent and family
2. Change of land use
3. Change of income and major sources
4. Change of Marketing
5. Respondent's perception of the impact of Highway No. 5.
6. Change of Agricultural activities
7. Change of social aspects
8. Transport and access
9. Problems

(2) Features of the Surveyed Area and Respondents

Basic economic and social data of the surveyed area are shown in the following three tables. Industrial structures or social conditions of the two provinces, six districts and six communes of the survey are shown in these tables. Industrial structure of Hai Duong Province changed gradually from 1996 as shown in Table 3.1.3.2. Agriculture, forestry and fisheries accounted for 42 % of GRP, and they were the main sectors in 1996. Currently, industry and construction replace that, accounting for 38%. In the rural sector, agriculture, forestry and fisheries, the structure was not changed from 1996 to 2002; cultivation accounted for 74%, livestock 24%, and services 3%. For Hung Yen Province, GRP was smaller than that of Hai Duong Province. Output value of rural sector was also smaller than that of Hai Duong, while its structure was similar to that of Hai Duong; cultivation accounted for 74%, livestock for 25%, and services for 1.4%.

Table 3.1.3.2: Industrial structure of Hai Duong and Hung Yen Province

	Hai Duong				Hung Yen		
	1996		2001		1996		
Gross domestic product at current prices	Amount (Bill. VD)	Share (%)	Amount (Bill. VD)	Share (%)	Amount (Bill. VD)	Share (%)	(
Agriculture, forestry, fisheries	1,884	41.8%	2,220	33.3%			
Industry, construction	1,531	33.9%	2,533	38.0%			
Services	1,096	24.3%	1,913	28.7%			
Total	4,511	100%	6,666	100%	2,354		
Gross output of agriculture	Amount (Bill. VD)	Share (%)	Amount (Bill. VD)	Share (%)	Amount (Bill. VD)	Share (%)	(
Cultivation	2,187	74.6%	2,572	74.2%	1,290	75.9%	
Livestock	706	24.1%	818	23.6%	389	22.9%	
Services	47	1.6%	76	2.2%	22	1.3%	
Total	2,931	100%	3,466	100%	1,701	100%	
Population (1000)	1,671		1,676		1,037		
GDP per capita (Mill. Dongs)	2.70		3.98		2.27		

Source: Statistical Yearbook of Hai Duong and Hung Yen Province.

Table 3.1.3.3: Indicators of Surveyed Districts

Province	Hai Duong			Hung Yen	
District	Cam Giang District	Kim Thanh District	Ninh Giang District	Van Lam District	Yen My Distric
Access	50 km to Hanoi.	85km to Hanoi, 25km to Hai Phong	30 km from HW5 and Hai Duong.		
Population	119,195 (01)	123,892 (01)	146,397 (01)	93,975 (01)	123,325 (01)
Land Area	107 km2	112,9 km2	35.4 km2	74.42 km2	91 km2
Administration	17 communes, 2 township	20 communes, 1 township	27 communes, 1 township	10 communes, 1 township	16 communes, 1 township
Cultivated area (ha)	7,406 (2001), 6,000 (2000)	14,230 (02)	8,902 (01), 9,000 (02)		
Paddy planted area (ha)	11,402 (00), 11,547 (01)	11,141 (00), 11,278 (01)	15,303 (00), 15,287 (01)	8,237 (00), 8,153 (01)	10,064 (00), 10,050 (01)
Spring paddy planted area (ha)	5,689 (00), 5,690 (01)	5,855 (00), 5,806 (01)	7,728 (00), 7,628 (01)	4,077 (00), 4,024 (01)	4,856 (00), 4,880 (01)
Winter paddy planted area (ha)	5,713 (00), 5,857 (01)	5,286 (00) 5,472 (01)	7,575 (00), 7,659 (01)	4,160 (00), 4,129 (01)	5,208 (00), 5,170 (01)
Income per capita (million VD)	3.00 (97), 4.00 (00), 5.72 (02)	2.60 (97), 3.20 (00), 3.40 (02)	2.70 (97), 3.25 (00), 3.40 (02)		
GDP growth (%)	8.5-9 % (02)	9.35%			
GDP Share (%) Agriculture, livestock, forestry	45 % (2001)	57% (02)	56% (02)		
Industry & construction	30 % (2001)	19% (02)	16% (02)		
Services	25 % (2001)	25% (02)	28% (02)		
Poor (%)	9.3 % (01), 8.0 % (02)	NA	14.6% (01), 12.8% (02)		
Gross Output of Living weight of livestock (ton)	3757 (00), 4534 (01)	3534 (00), 4945 (01)	4665 (00), 5145 (01)	5133 (00), 5954 (01)	4063 (00), 4897 (01)
Gross Output of fisheries (ton)	1706 (00), 2425 (01)	370 (00), 367 (01)	1074 (00), 1204 (01)	260 (00), 271 (01)	202 (00), 228 (01)
Industrial Output Value (Mill. VND)	332,789 (00), 411,656 (01)	55,395 (00), 62,066(01)	130,492 (00), 132,003 (01)	191,266 (00), 966,505(01)	71,483 (00), 135,982 (01)

Table 3.1.3.4: Indicators of Surveyed Communes

Province	Hai Duong			Hung Yen		
Commune	Cam Doai Commune, Cam Giang District	Lai Vu Commune, Kim Thanh District	An Duc Commune, Ninh Giang District	Dinh Du Commune, Van Lam District	Giai Pham Commune, Yen My District	Ban Yen Nhan Commune, My Hao District
Access	2km from HW5.	Along the HW5.	10 km from Ning Giang, 20km from HW5.	Along the HW5.	Along the HW5.	Along the HW5.
Population	3,600 (02)	4,785 (02)	5,040 (02)	7,123 (01)	5,519 (01)	8,752 (01)
Households	800 HH	1,200 HH	1,229HH	1,843 HH	1,452 HH	2,208 HH
Land Area	481 ha	400 ha	558 ha			
Cultivated area	280 ha (02)	292 ha (02)	645ha (02)			
Paddy planted area (ha)	11,379 (01)	600 ha (02),	543ha (02)			
Income per capita (million VD)	1.8 (96), 2.0 (98), 2.2 (99), 4.1 (00), 4.4 (01), 4.9 (02)	2.4 (98), 2.7 (99), 2.9 (00), 3.4 (01), 3.9 (02)	2.1 (96), 2.28 (02)		3.6-4.8	
Income per sector (mill. VD)	25(97),34 (02)	15 (97), 23 (02)				
Major sources of income (Billion VD:%)						
Farming	3.5: 83% (97), 3.9: 65% (02)	27% (02)	6.9: 51% (02)			
Livestock	0.72:17% (97), 4.8: 35% (02)	29% (02)	2.8: 21% (02)			
Small industry		43.5% (02), Construction 30%	1.5:11% (02)			
Services		13% (02)	2.3:17% (02)			
Poor (%)	9.3 % (02)	15% (98), 7% (02)	35% (96), 14% (02)	1.7 (01)	4.2 (01)	0.5 (01)
Motorbike (#r of HH : % of HH)	24:3% (97), 400: 50% (02)	Less than 100: 8% (98), 500: 42% (02)	30: 2% (97), 300 :25 % (02)			

Table 3.1.3.5 shows the basic indicators of surveyed communes and respondents. Depending on the respondents' availability, 32 to 36 households were interviewed. The samples of poor households were limited to only 9 households in total against the initial plan. According to the indicators, the rate of poor households was around 10% in Hai Duong province. However, while conducting interviews in 6 communes, it was hard to sort out "poor" households with total per capita income of just VND 100,000 VND/ month because the total real per-capita income of "poor" households in this area is much higher than national standards. In addition, poor people do not tend to reveal their income and refuse to give interviews; only a few of them agreed to be interviewed. For example in Giai Pham commune, the field work team was introduced to 23 "poor" households, while just two of them agreed to receive interviews. Average family size is around 4.2 for case communes. The size varies from 3.84 for Giai Pham to 4.67 for An Duc commune.

Table 3.1.3.5: Basic Indicators of Surveyed Communes and Respondents

Province	District	Commune	General indicators					Respondents		
			Population (2001)	Households (HH)	Average family member	Number of poor HH	Share of poor HH	Reopondent HH	Number of Poor HH	Average number of family member
Hai Duong	Kim Thanh	Lai Vu	4,825	1,292	3.73	150	11.6%	34	0	3.85
Hai Duong	Cam Giang	Cam Doai	3,628	859	4.22	78	9.1%	35	2	4.40
Hai Duong	Ninh Giang	An Duc	4,972	1,283	3.88	166	12.9%	36	4	4.67
Hung Yen	Van Lam	Dinh Du	7,123	1,843	3.86	30	1.7%	34	0	4.09
Hung Yen	Yen My	Giai Pham	5,519	1,452	3.80	61	4.2%	32	1	3.84
Hung Yen	My Hao	Ban Yen Nhan	8,752	2,208	3.96	10	0.5%	35	2	4.11
Total/average			34,819	8,937	3.90	496	5.5%	206	9	4.17

Sources: Study team. Hai Duong and Hung Yen Provinces.

3.1.3.2 Local Agricultural Markets Survey

It is expected that the improvement of Highway No.5 has effected the way wholesalers trade agricultural products in the local markets. The local market survey was implemented to identify the impact on the local economy from the viewpoints of the marketing pattern.
The markets for survey are selected from local wholesale markets, including Duong Cai, Yen My, and Bac markets in Hung Yen and Nam Sach market in Hai Duong. For interview, 54 traders were randomly selected. These traders were individually interviewed by surveyors with respects to the following points.

1. Profile of respondent
2. Change of products traded and their origins
3. Change of marketing channels
4. Change of people involved in trading
5. Impacts of Highway No.5 upgrading on their business

The characteristics of respondent traders are described below.

Table 3.1.3.6: Surveyed Markets and Respondents

Market	District	Province	Respondents	Coming from other provinces	
				Respondents	Name of province
Duong Cai	Van Lam	Hung Yen	24	2	Vin Phuc, Bac Ninh
Yen My	Yen My	Hung Yen	12		
Bac	My Hao	Hung Yen	7		
Nam Sach	Nam Sach	Hai Doung	11	1	Hung Yen
Total			54	3	
Percent				5.6%	

Out of 54 respondents three are from other provinces. 22 out of 54 respondents started trading business after 1997, accounting for 41%, of which 14 traders, accounting for 64%, were farmers before starting business. 54% of these people started business because of more profitability than farming.

Table 3.1.3.7: Profile of Respondents: Starting trade business

	Start business after 1997	Farmer before starting business	Start because more profitable than farming
Hung Yen	18	11	16
Hai Doung	4	3	6
Total	22	14	22
Percent	40.7%	63.6%	52.4%

Table 3.1.3.8 shows the list of products they deal with. A large number of products are dealt with by the respondent traders. Most of the products they deal with are from local areas (see Table 3.1.3.9). Ninety two percent of products are from Hai Duong, Hung Yen and self-production. Especially 28% sell self-produced products. They also buy products from suppliers, of which 90% are from local areas: Hai Duong and Hung Yen provinces. Eighty two percent of respondents purchase these products from farmers (see Table 3.1.3.10). Half of the respondents go to buy products from farmers, and 32% buy from approaching farmers .

Table 3.1.3.8: The Products Dealt in the Markets

:

	1st major product		2nd major product		3rd major product		4th major product		1-4 major product	
	Respondents	Percent	Respondents	Percent	Respondents	Percent	Respondents	Percent	Respondents	Percent
Meat	14	25.93							14	25.9
Vegetables	6	11.11	2	3.70	2	3.70			10	18.5
Malabar nightshade			5	9.26	1	1.85	1	1.85	7	13.0
Spice vegetables	2	3.70	4	7.41			1	1.85	7	13.0
Colza	2	3.70	1	1.85	2	3.70			5	9.3
Fish	3	5.56	2	3.70					5	9.3
Tomato	3	5.56	2	3.70					5	9.3
Pot-herbs	2	3.70			2	3.70			4	7.4
Squash	2	3.70	1	1.85	1	1.85			4	7.4
Taro	3	5.56	1	1.85					4	7.4
Watermelon	2	3.70			1	1.85	1	1.85	4	7.4
Bean	1	1.85	1	1.85	1	1.85			3	5.6
Onion	1	1.85			1	1.85	1	1.85	3	5.6
Amaranth	1	1.85			1	1.85			2	3.7
Cucumber					1	1.85	1	1.85	2	3.7
Cucumber	1	1.85			1	1.85			2	3.7
Fruits	1	1.85			1	1.85			2	3.7
Gourd			2	3.70					2	3.7
Mango	2	3.70							2	3.7
Melon			2	3.70					2	3.7
Pear shaped melon	1	1.85	1	1.85					2	3.7
Chicken	1	1.85							1	1.9
Egg	1	1.85							1	1.9
Eggplant					1	1.85			1	1.9
Green peas			1	1.85					1	1.9
Innards			1	1.85					1	1.9
Large edible snail	1	1.85							1	1.9
Small edible snail			1						1	1.9
Orange			1	1.85					1	1.9
Pipe tobacco	1	1.85							1	1.9
Potato					1	1.85			1	1.9
Plum			1	1.85					1	1.9
Rice	1	1.85							1	1.9
Sugar-cane	1	1.85							1	1.9
Sweet potato buds	1	1.85							1	1.9
Total	54	100.00	29		17		5		105	

Table 3.1.3.9 Origin of Products and Suppliers

Origin of products			Origin of suppliers		
Origin	Respondents	Percent	Origin	Respondents	Percent
Hai Duong	12	22.2	**Hai Duong**	12	24.0
Hung Yen	22	40.7	**Hung Yen**	33	66.0
Other provinces	5	9.3	**Others province**	4	8.0
Self-production	15	27.8	**Ha Noi**	1	2.0
Total	54	100.0	Total	50	100.0

Table 3.1.3.10: Purchasing Routes of Products

	Respondents	Percent
Go to buy from farmers	27	50.0
Farmers come to sell	17	31.5
Go to buy from traders	7	13.0
Traders come to sell	7	13.0
Buy from local markets	1	1.9

3.2 Impacts from Foreign Direct Investment

Workers at a private enterprise along Highway No.5

3.2.1 Trends of FDI

3.2.1.1 Trend of FDI to the whole country

The following table presents the value of Foreign Direct Investment (FDI) to the whole country from 1988 to 2002. It is shown that that FDI to Viet Nam from 1988 recorded at US$21,805 million in terms of "Invested capital". The biggest investor is Japan, followed by Singapore, Taiwan, Korea and Hong Kong. FDI to the country started increasing in 1991, and reached the highest level in the mid 1990s. The Asian financial crisis from 1997, however, severely undermined this trend, and both the number and amount of FDI to Viet Nam reduced significantly in the late 1990s. It was only after 2000 that the investment showed some recovery. The recent recovery is, however, still weak with only US$203 million, and this amount is far from the historical highest level in 1995, which recorded at US$3,879 million. Considering the lag between actual investment and registered capital, the low level of invested capital will rebound in the coming few years.

Table 3.2.1.1: FDI to Viet Nam by country origin: Invested capital 1988-2002

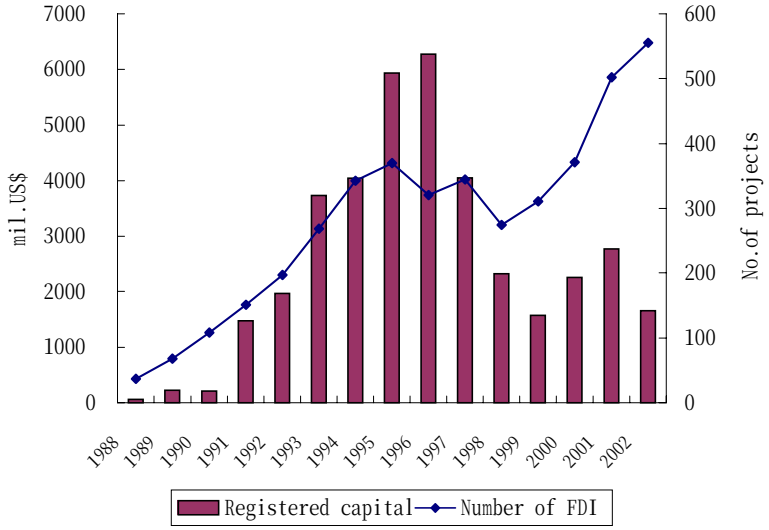
(mil. US$)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Japan		51	-	71	740	110	197	1,093	556	282	119	47	54	123	8	3,457
Singapore		1		504	193	345	534	510	321	211	39	29	9	63	4	2,770
Taiwan		3	62	147	490	288	381	260	239	131	89	98	134	89	17	2,434
Korea				52	185	490	335	425	419	61	19	28	57	59	48	2,184
Hong Kong	6	72	53	124	276	287	379	73	322	26	68	31	13	27	11	1,775
Netherlands				107	5	19	44	147	46	-	71	1	472	351	-	1,269
Malaysia	4		122	529	24	117	149	181	6	23	8	10	4	11	3	1,198
UK	532	16		11	389		15	1	23	2	4	44	2	5	8	1,055
B.V.I	2	5	11	7	101	332	91	139	129	38	15	26	98	17	3	1,023
France	2	54		37	53	177	22	135	55	200	20	13	1	81	-	856
Thailand				1	27	146	134	162	49	13	3	10	6	13	8	576
USA	-			19	-	-	75	193	100	54	21	51	26	8	6	558
Switzerland				1	1	4	4	84	-	2	-	1	13	-		518
Sweden			-	11				345	-	-	-	-			-	358
Cayman						89	166	5	42			17	14			335
Australia			-	18	80	17	59	33	20	1	3	14	8	1	1	262
Russia	9		-	10	10	6	6	8	5	1	2	10	4	9	62	148
Bermuda							141						6			147
China			1	5	21	3	3	5	2	14	8	15	15	20	14	132
Indonesia				36	71	16			-	1						126
Germany					21	2		29	18	33	3	7	-	1	1	119
Others	2	3	5	73	47	65	459	51	63	30	47	85	43	25	9	505
Total	557	205	254	1,763	2,734	2,513	3,194	3,879	2,415	1,123	539	537	979	903	203	21,805
Registered capital	60	226	212	1,477	1,969	3,736	4,041	5,936	6,275	4,050	2,317	1,571	2,252	2,775	1,658	38,563
Number of FDI	37	68	108	151	197	269	343	370	321	345	275	311	371	502	555	3663

Source: MPI

Figure 3.2.1.1 shows the trend of the number of FDI projects and their amount of registered capital using the data of Table 3.2.1.1. It is clearly shown that Viet Nam received the largest amount of registered capital of FDI in the mid 1990s. This amount declined in the late 1990s, but started increasing again after 2000. The increase in the number of FDI projects after 2000 was significant in particular.

Figure 3.2.1.1: Trend of FDI inflow to Viet Nam



Source: MPI

Figure 3.2.1.2 presents the total amount of foreign invested capital after 1999, when Highway No.5 was practically in use. It shows where foreigners invest in northern Viet Nam now. Ha Noi and Hai Phong remain the most popular destinations, and all others are also located in Ha Noi - Hai Phong transport corridor. We cannot jump to early conclusion, but the improvement of Highway No.5 and Hai Phong Port should be important factors to attract FDI to these provinces.

Figure 3.2.1.2: Total amount of foreign invested capital, 1999-2002

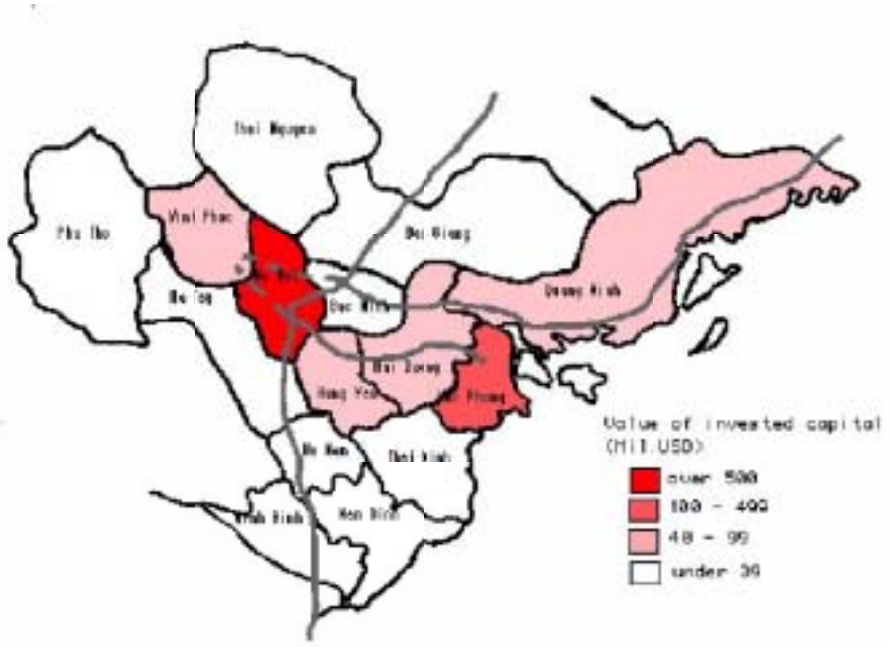
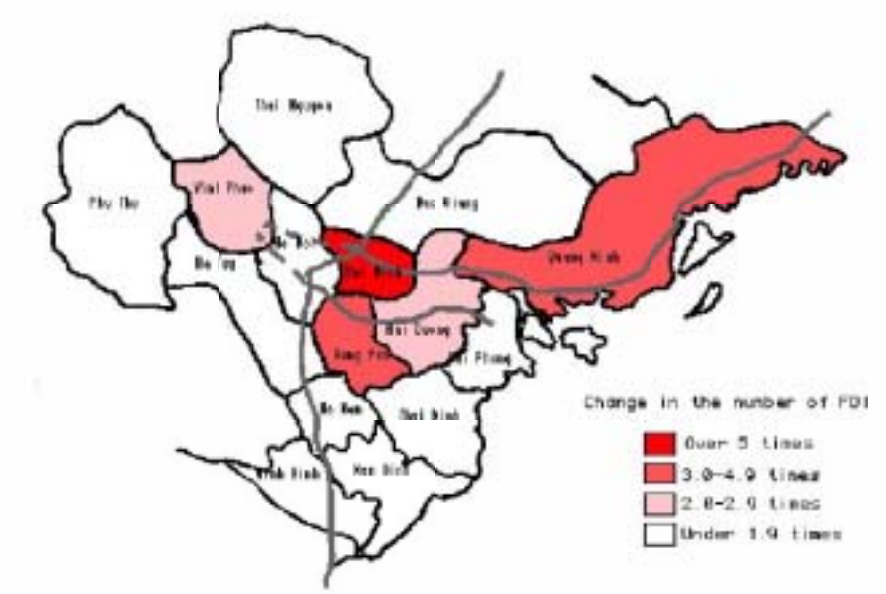


Figure 3.2.1.3 shows the new favorites for foreign investors in northern Viet Nam. Total number of FDI projects from 1995 to 1998 was compared with those after 1999. The number of FDI to Bac Ninh

province increased over 5 times between the two periods, followed by Hung Yen, Quang Ninh, Hai Duong and Vinh Phuc. It seems that the provinces along the Highway No.5 now should have a strategic importance for foreign investors now.

Figure 3.2.1.3: Comparison in the number of FDI projects between 1995-98 and 1999-02



3.2.1.2 Trend of FDI to the Provinces along Highway No.5

The trend of FDI to the four provinces along Highway No.5 is presented in the next table and figure. These provinces include Ha Noi, Hung Yen, Hai Duong and Hai Phong. The data shows the similar tendency as those of the whole country. The provinces received a significant value of FDI during 1995 and 1997, but the following Asian financial crises badly affected the inflow of FDI. From 2001, however, the FDI to the provinces increased again. Among the four provinces, Ha Noi has the lion's share in terms of number and value of FDI. Ha Noi alone received 70% of the whole invested capital to the four provinces during the period. The share of Hung Yen province remained very small, but the province started attracting more FDI recently. Hai Duong province received a large amount of invested capital in 1995, which was made by Ford Motor along the Highway No.5.

Table 3.2.1.2: Number of FDI to the provinces along Highway No.5

(a) Number of FDI projects

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Hanoi	3	5	8	23	34	41	41	30	41	42	30	33	45	66	442
Hung Yen							2	1		2		1	2	15	23
Hai Duong		1		1	3	1	5	3		1	3	2	8	8	36
Hai Phong			3	7	1	9	11	10	17	5	10	5	14	29	121
Total	3	6	11	31	38	51	59	44	58	50	43	41	69	118	622

(b) Invested Capital

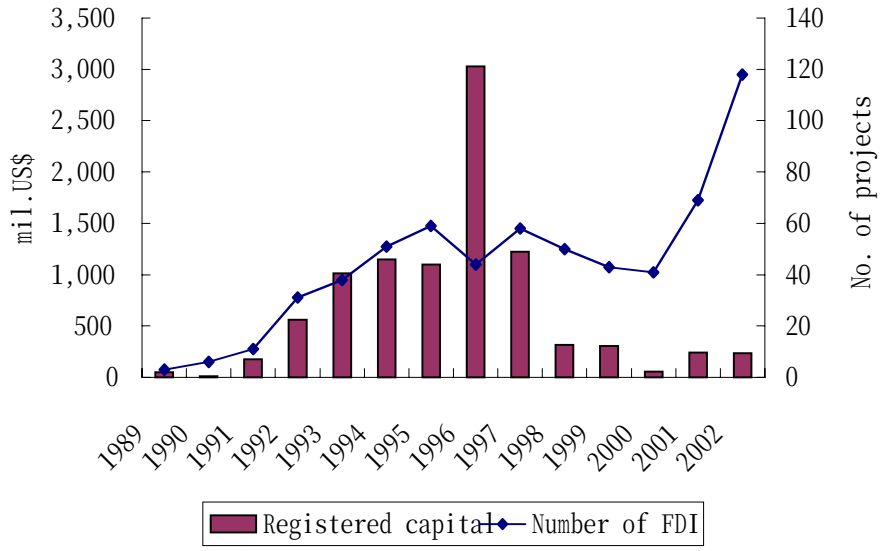
(mil.US$)	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Hanoi	52	4	115	225	828	549	575	239	197	104	22	17	81	7	3,015
Hung Yen							48	4		5		4	10	12	83
Hai Duong		2		3	7	2	102	19		3	1	2	6	3	151
Hai Phong			10	304	17	285	114	159	120	7	19	2	25	16	1,078
Total	52	6	125	532	852	836	839	422	317	119	42	25	122	38	4,326

(c) Registered capital

(mil.US$)	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Hanoi	48	7	165	230	989	897	789	2,550	922	298	257	39	179	148	7,518
Hung Yen							51	4		6		7	14	24	106
Hai Duong		2		3	12	3	135	284		4	6	3	25	11	487
Hai Phong			10	329	12	250	123	188	304	8	42	4	20	55	1,345
Total	48	9	175	562	1,013	1,150	1,098	3,026	1,226	316	305	53	238	238	9,457

Source: MPI

Figure 3.2.1.4: Trend of FDI inflow to the four provinces along the Highway No.5



In the case of FDI to Hung Yen and Hai Duong provinces, most foreign enterprises are located along the Highway No. 5. Several foreign enterprises are also located along the Highway No. 18 in Hai Duong province. Figure 3.2.1.5 and Figure 3.2.1.6 show the geographical distribution of newly invested foreign and domestic enterprises in the two provinces. Most of the new investments are concentrated on the area along the Highway No.5 and No. 18. The renovation of the two highways should be one important factor to attract investment in the region.

Domestic private enterprises are also very active in coming to these provinces. The value of investment of domestic enterprises to Hung Yen, for instance, is much larger than that of FDI (see Table 3.2.1.6). Some of these domestic enterprises are purely private investments; others are equitized SOEs or joint stock companies established by SOEs. Many of them are originated in Ha Noi or HCMC.

Figure 3.2.1.5: Hung Yen, Location of FDI and Domestic Enterprises

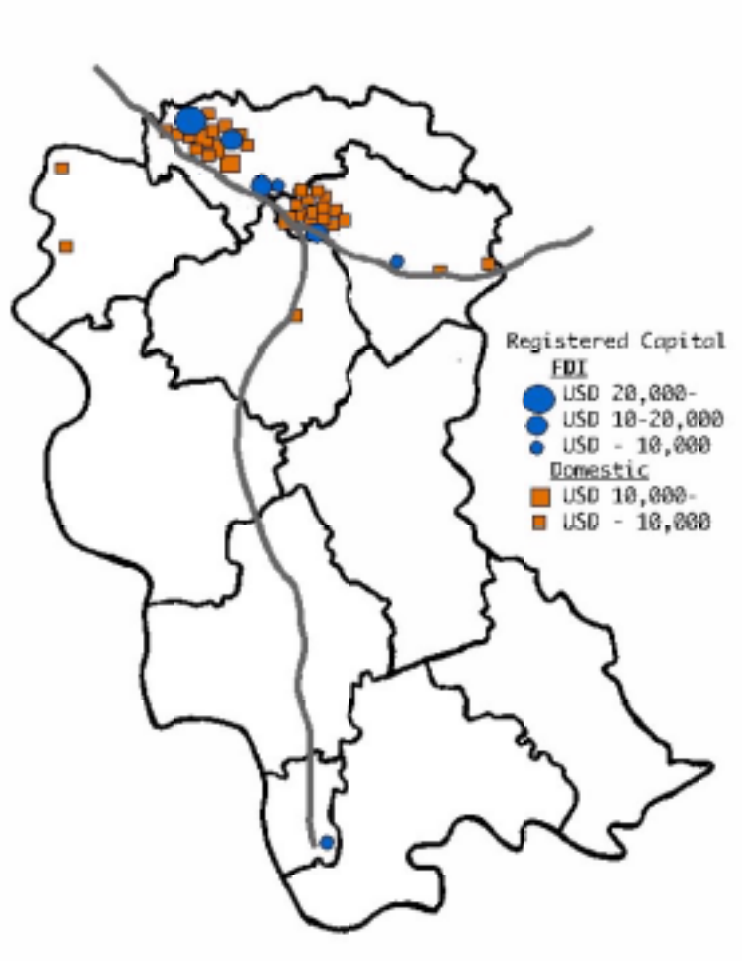


Figure 3.2.1.6: Hung Yen, Location of FDI and Domestic Enterprises

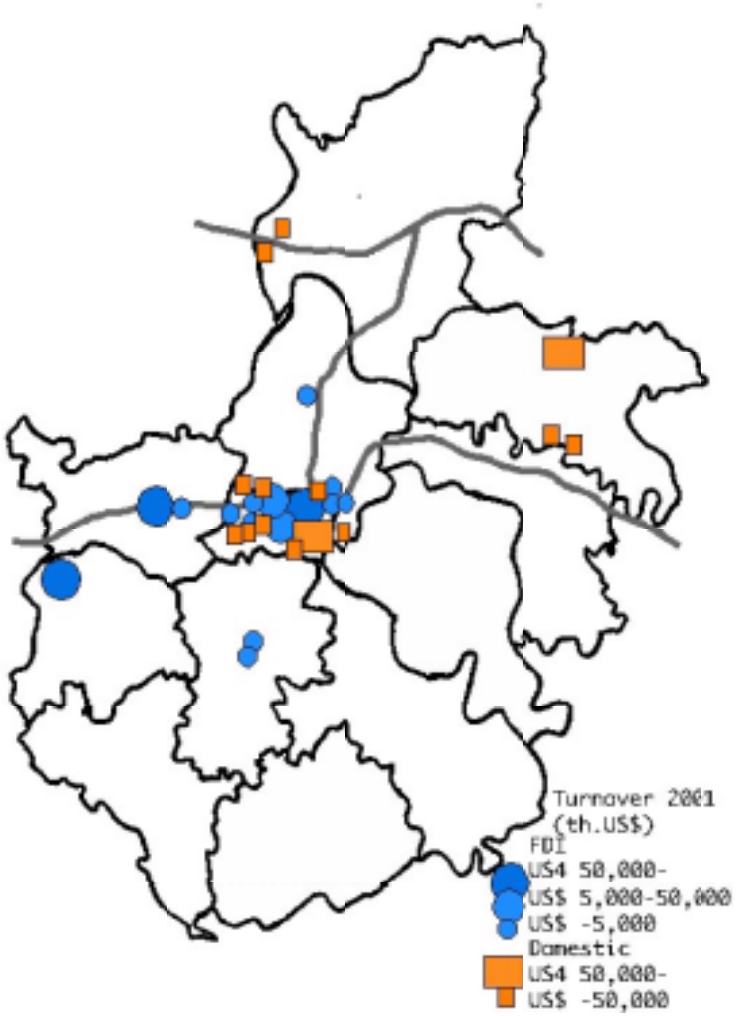


Table 3.2.1.3: Hung Yen, List of FDI

No	Project	Location	Capital (1000 USD)	Year of registration	Product	No of employees	Local counterpart
1	Zoamidco Poultry raising JV	Nhan Hoa, My Hao	12,000	1995	Poultry raising, folder production		Iddison poultry Ltd West Samoa New Zealand (70%)
2	LG-SEL Electronic Vietnam	Nhu Quynh, Van Lam	12,000	1995	Color TV & electronic equipment manufacturing & assembly	181	LG Electronic, Korea (55%)
3	Car and Motorbike spare part manufacturing JV	Nhu Quynh, Van Lam	39,000	1995	Automobile & motorbike spare part manufacturing, IKD motorbike assembly	1098	Summit Autoparts Industry Co.LTD International Co Thai Lan, Laos (70%)
4	Vietnam PU mousse JV	Pho Hien, Hung Yen town	4,435	1996	PolyUrethan mousse production	55	Nicjimen Mitsui Toyota Japan (62%)
5	Thien Hung welding rod manufacturing JV	Phung Chi Kien, My Hao	2,000	1999	Welding rod manufacturing		O He Gang and Song Shu China (70%)
6	Branch of Cargill Vietnam	Trung Trac, Van Lam	12,482	2000	Folder production		Cargill Group US (100%)
7	Branch of Long An mineral water JV	Nhu Quynh, Van Lam	1,129	2000	Mineral bottling		France (65%)
8	TAEYANG Vietnam Ltd.	Trung Trac, Van Lam	5,000	2000	Inox utensil production		Korea (100%)

Source: DPI, Hung Yen Provincial Peoples Committee

Table 3.2.1.4: Hai Duong, List of FDI

No.	Name of enterprise	Address	No of employees	Turnover in 2001 (th.USD)
	Manufacturing			
1.	Purified Water Company	Hai Duong city	104	480
2.	Processing Food for Livestock Breeding	Binh Giang	150	6,000
3.	Nghia My Co.Ltd	Nam Sach	185	1,500
4.	Viet - Trieu Friendship Sil Co. Ltd	Hai Duong city	11	0
5.	BVT Co. Ltd	Gia Loc	176	140
6.	VENTURE International Joint Venture Co.	Cam Giang	950	7,000
7.	BVT CRIKET Co. Ltd	Gia Loc	15	150
8.	CANSALIPACK Joint Venture Company	Hai Duong City	34	300
9.	FORD-Viet Nam Co.Ltd	Hai Duong City	265	50,000
10.	Enterprise	Hai Duong City	302	2,800
11.	EBARA Pump Joint Venture Company	Hai Duong City	51	2,500
12.	Asia - Pacific Agricultural Development Co.	Hai Duong City	27	830
13.	Van Dac Phuc Co. Ltd	Cam Giang	38	520
	Transport. communication			
14.	Hong Ha Taxi Joint Venture Company	Hai Duong City	6	165

Source: DPI, Hai Duong Provincial Peoples Committee

Table 3.2.1.5: Hung Yen, List of Domestic New Investments

No	Project	Product	Location	Year of registration	Capital (1000 USD)	No of Employees
1.	A/C and fridge assembly enterprise	Electric applicants	Nhu Quynh, Van Lam	1995	2.75	125
2.	RIB-Ha Van socking manufacturer	RIB socks	Nhu Quynh, Ven Lam,	1996	420	50
3.	Hoa Phat furniture	Office furniture	Nhu Quynh, Ven Lam,	1997	11.157	450
4.	Dai Nam steel pipe	Steel pipes	Nhu Quynh, Van Lam	1997	14.187	210
5.	Mousse and spring bed cushion factory	Mousse and spring cushion	Minh Duc, My Hao	1997	800	30
6.	Thuan Thanh sport shoe factory	Sport shoes for export	Nhu Quynh, Van Lam	1997	542	30
7.	LiOA transformer factory	Stabilizers, transformers, cables	Nhu Quynh, Van Lam	1998	4	50
8.	Phuong Dong agricultural production	Agricultural products for export	Xuan Duc, My Hao	1999	129	50
9.	Export ceramic factory	Ceramic products	Xuan Quan, Van Giang	1999	135	100
10.	Hung Yen Industrial and Export Co.	Training on automobile repair, Import-export service	Ban Yen Nhan, My Hao	1999	1.57	30
11.	Organic fertilizer and mineral factory	Organic fertilizer	Pham Ngu Lao, Kim Dong	1999	107	30
12.	Kinh Do food processing Co.	Bakery, high quality foods	Ban Yen Nhan, My Hao	1999	1.29	
13.	Ho Guom Garment Co.	Garment for export	Ban Yen Nhan, My Hao	1999	1.5	600
14.	Ha Binh Ltd	Food processing	Yen My	2000	408	50
15.	Nhu Quynh Carton Packaging Co.	Carton packaging production and trading	Nhu Quynh, Van Lam	2000	1.619	
16.	Material processing and ceramic production factory	Material processing and ceramic production for export	Van Giang	2000	622	
17.	Commercial Glass productioin Co	Glass panels	Nhu Quynh, Van Lam	2000	1.259	
18.	Anh Vu Garment Co	Garment for export	Ban Yen Nhan, My Hao	2000	1.478	600
19.	Nhu Quynh Garment enterprise	Garment for export	Nhu Quynh	2000	500	
20.	Viet-A electrical equipment factory	Electrical equipment	CN Pho Noi B	2000	2.143	
21.	Wool knitting and domestic applicant production enterprise	Socks, gas stove, inox pans	Ban Yen Nhan	2000	3	
22.	Steel and roofing enterprise	Zinc coated steel rolls, metal roofing panels	Nhu Quynh	2000	1.086	
23.	Electrical and Motorbike Assembly and Production Co.	Assembly of electrical applicant, production of motorbike spare part	Ban Yen Nhan	2000	3.6	
24.	Figured Steel Milling Plant	Milled steel, roofing tole	Nhu Quynh	2000	16.57	
25.	Station for Petro and transportation service	Petro supply and transportation service	Nhu Quynh	2000	311	20
26.	Electrical Applicant and Insulation Cable Manufacturing Plant	A/C, refregerators, microwaves	Nhu Quynh	2000	4.866	
27.	Viet Trung Motorbike Assembly and Spare Part Manufacturing Co	Assemble motors, producing spare part	CN Pho Noi B,	2000	5.18	
28.	Ceramics for Export enterprise	High quality ceramics for export	CN Pho Noi A,	2000	1.049	
29.	Song Da Steel Plant	Steel Milling	Giai Pham, Yen My	2000	14.858	
30.	High Quality Food Processing Co	High quality Foods	Ban Yen Nhan	2000	660	
31.	Inox Shearing Plant	Processing and trading inox products	Pho Noi A	2000	986	
32.	Weaving Handicrafts Production Co	Weaving handicraft products for export	Nghia Hiep, Yen My	2000	938	
33.	Garment and Shoes Production Co,	Garment and Shoes for export	CN Pho Noi B	2000	1.479	

Source: Statistical Yearbook of Hung Yen, 2000

Table 3.2.1.6: Hung Yen, Number and Value of FDI and Domestic Investment

(Thousand . USD)

	1995	1996	1997	1998	1999	2000
FDI						
projects	3	1	0	0	1	3
Investment capital	63	4,435	0	0	2,000	18,611
DOMESTIC INVESTMENT						
projects	1	1	4	1	6	20
Licensed Investment	2,750	420	26,686	4,000	4,731	62,612

Source: DPI of Hung Yen Provincial Peoples Committee

Table 3.2.1.7: Hai Duong, List of SOEs under the Central Government

No.	Name of enterprise	Address	labors (pers.)	2001 (thous.USD)
	Agriculture, forestry			
1.	Cam Binh Animal Feed Enterprise	Cam Giang	57	3,265
2.	Bac Hung Hai Exploitation of Irrigation Works Co.	Hai Duong City	158	10,239
	Mining			
3.	Kaolinite Processing and Exploiting enterprise	Kinh Mon	115	1,512
4.	Truc Thon Refactory Materials and Clay Exploiting Co.	Chi Linh	566	24,621
	Manufacturing			
5.	Hoang Thach Cement Co.	Kinh Mon	2,611	1,376,847
6.	Pha Lai Glass Co.	Chi Linh	416	18,431
7.	Hai Duong Porcelain Co.	Hai Duong City	955	42,640
8.	Hai Duong Grindstone Co.	"	425	17,925
9.	Hai Duong Pump Manufacture Co.	"	549	33,229
10.	IV Irrigation and Agriculture Electromachanics Co.	"	37	264
11.	H, Hung General Materials Co.	"	486	5,213
12.	Hai Duong Ship Building Factory	"	182	10,995
	Electricity and Water			
13.	Pha Lai Thermal Power Plant	Chi Linh	2,329	940,754
14.	Hai Duong Electricity Construction	Hai Duong City	633	315,558
15.	Construction No. 18 Co.	Hai Duong City	3,460	140,852
16.	Mechanical. Construction & Installation No. 17 Co.	Chi Linh	569	26,053
17.	69 - 3 Machinery Assemble and Construction Co.	Kinh Mon	1,056	32,630
18.	11Co.	Hai Duong City	511	18,707
	Wholesale and Retail Trade, Repair			
19.	Ninh Giang Grinding Factory	Ninh Giang	39	7,823
20.	Hai Duong Petroleum Branch	Hai Duong city	404	2,617,261
21.	Hai Duong Publishing Co.	Hai Duong city	53	9,391
22.	Hai Duong Foodstuff Co.	Hai Duong city	467	88,500
	Transport, Telecommunication			
23.	Hai Duong Post and Telecommunication	Hai Duong city	737	96,317
	Finance, Credit			
24.	Branch of Hai Duong Industry and Commerce Bank	Hai Duong city	158	
25.	Bank	Hai Duong city	83	54,959*
26.	Branch of Agriculture and Rural Development Bank	Hai Duong city	449	54,974*
27.	Hai Duong Gem and Jewellery Co.	Hai Duong city	75	47,668*
28.	Hai Duong Insurance Co.	Hai Duong city	33	18,594*
29.	Hai Duong Life Insurance	Hai Duong city	15	12,882*

Source: CONCETTI

Table 3.2.1.8: Hai Duong, List of SOEs under the Local Government

No.	Name of enterprise	Address	No. of (pers.)	Turnover in (thous.USD)
	Agriculture. forestry			
1.	Chi Linh Farm	Chi Linh	328	522
2.	Hai Duong Plants Co.	Hai Duong city	310	5,378
3.	Hai Duong Investment and Silkworn Business Co.	Hai Duong city	160	2,699
4.	Cau Xe Fruit Tree Factory	Tu Ky	126	256
5.	Hai Duong Animal Breed Center	Hai Duong city	45	1,556
6.	Hai Duong Agricultural Electromechanics	Hai Duong city	239	3,258
7.	Hai Duong Irrigation Works Exploitation Factory	Hai Duong city	23	375
8.	Chi Linh Irrigation Works Exploitation Factory	Chi Linh	88	1,930
9.	Nam Sach Irrigation Works Exploitation Factory	Nam Sach	158	3,693
10.	Thanh Ha Irrigation Works Exploitation Factory	Thanh Ha	153	3,360
11.	Kinh Mon Irrigation Works Exploitation Factory	Kinh Mon	104	2,872
12.	Kim Thanh Irrigation Works Exploitation Factory	Kim Thanh	116	2,054
13.	Gia Loc Irrigation Works Exploitation Factory	Gia Loc	172	3,253
14.	Tu Ky Irrigation Works Exploitation Factory	Tu Ky	157	3,944
15.	Cam Giang Irrigation Works Exploitation Factory	Cam Giang	91	2,478
16.	Binh Giang Irrigation Works Exploitation Factory	Binh Giang	89	2,376
17.	Thanh Mien Irrigation Works Exploitation Factory	Thanh Mien	157	2,936
18.	Ninh Giang Irrigation Works Exploitation Factory	Ninh Giang	147	3,560
19.	Chi Linh Plantation	Chi Linh	104	162
	Fishing			
20.	Nam Sach Enterprise for Fish Breeding	Nam Sach	26	275
21.	Than River Fish Breeeding Factory	Kinh Mon	28	170
22.	Ha Xa Fish Factory	Cam Giang	46	179
	Mining			
23.	Hai Duong Minerals and Stone Exploitation and	Kinh Mon	449	27,117
	Manufacturing			
24.	Hai Duong Beer and Beverage Co.	Hai Duong city	242	34,436
25.	TPXK Farm Products Processing Co.	Hai Duong city	254	65,547
26.	Hai Duong Garment I Co.	Hai Duong city	553	7,269
27.	Hai Duong Garment II Co.	Hai Duong city	936	14,555
28.	Hai Duong Shoes Co.	Hai Duong city	1,516	152,305
29.	Hai Duong Printing Factory	Hai Duong city	109	5,992
30.	Hai Duong Cement Co.	Hai Duong city	411	39,216
31.	Hai Duong Water Engineering Factory	Kinh Mon	113	150
32.	Hai Duong Export Shoes. Carpets Co.	Hai Duong city	226	5,213
	Production and supply of electricity and Water			
33.	Hai Duong Water Supply Co.	Hai Duong city	243	14,540
	Construction			
34.	Hai Duong Construction No. 1Co.	Hai Duong city	576	17,383
35.	Hai Duong Construction No. III Co.,	Chi Linh	212	12,061
36.	Hai Duong Construction No. IV Co.	Nam Sach	246	17,076
37.	Hai Duong Construction No.V Co.	Kinh Mon	288	14,822
38.	Hai Duong Housing Co.	Hai Duong city	97	6,920
39.	Hai Duong Power Installation Co.	Hai Duong city	265	14,695
40.	Hai Duong Transport Works Co.	Hai Duong city	307	15,213
41.	Hai Duong Co. for Installation of Hydraulic Works	Hai Duong city	250	35,164
42.	Hai Duong Dyke Construction Co.	Hai Duong city	321	27,688
43.	Hai Duong Infrastructure Construction and Urban	Hai Duong city	474	12,892
44.	Hai Duong Dredger Co.	Hai Duong city	114	4,432
	Wholesale and Retail Trade. Repair			
45.	Agricultural Materials Co.	Hai Duong city	131	10,322
46.	Hai Duong Cinema Co.	Hai Duong city	38	428
47.	Hai Duong Educational Equipment and Book Co.	Hai Duong city	45	14,744
48.	Hai Duong Export and Import Co.	Hai Duong city	230	32,192
49.	Hai Duong Trade and Service Co.	Hai Duong city	55	18,795
50.	Hai Duong Materials and Fuel Co.	Hai Duong city	303	297,892
51.	Hai Duong Handicraft Products Co.	Hai Duong city	227	21,913
52.	Hai Duong Export Handicrafts Co.	Hai Duong city	143	17,169
53.	Hai Duong Farm Products and Foodstuff Co.	Hai Duong city	376	42,572
54.	Pharmaceutical Equipment and Supplies Co.	Hai Duong city	425	57,748
55.	Con Son Manufacture. Trade and Service Co.	Hai Duong city	30	40,532
	Hotels. restaurants			
56.	Con Son Labor Union Hotels and Tourism Co.	Chi Linh	30	621
57.	Hotels and Tourism Co.	Hai Duong city	299	12,205
	Transport, Storage			
58.	Cong Cau Port	Hai Duong city	122	6,248
	Finance. Credit			
59.	Lottery Co.	Hai Duong city	27	17,325
	Real Estate and Consultants			
60.	Construction and Urban Development Consulting Co.	Hai Duong city	83	3,336
61.	Construction and Transport Consulting Co.	Hai Duong city	36	1,518
62.	Irrigation Construction Consulting Co.	Hai Duong city	66	3,167

Source: CONCETTI

3.2.1.3 Share of FDI in the economy

In order to see the economic impact of the recent FDI, the share of FDI in the provincial economy shall be examined with respects to GRP, industrial output and industrial labor force. Table 3.2.1.9 shows the composition of provincial GRP by ownership. The shares of FDI in the provincial GRP are expanding for all provinces. The massive inflow of FDI in the mid 1990s should have resulted in the large FDI share in the local economy. In Ha Noi, for instance, the share of FDI rose from 7% in 1995 to 15% in 2002. As shown before, the total amount of FDI inflow to Hung Yen is still modest, but the FDI already made 13% of local GRP in 2001.

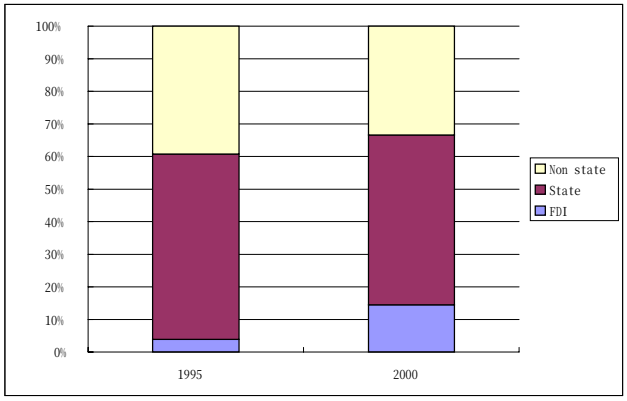
Table 3.2.1.9: Structure of Provincial GRP by ownership

(%, constant 1994 prices)

	1995	1996	1997	1998	1999	2000	2001
Hanoi							
FDI	**6.5**	**10.2**	**11.2**	**12.6**	**13.0**	**15.9**	**15.4**
State (%)	70.6	66.1	67.9	67.3	65.4	63.6	64.0
Non State (%)	22.9	23.7	20.9	20.1	21.6	20.5	20.6
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Bill.VND)	12,388	13,593	14,800	16,316	17,326	19,513	21,494
Hung Yen							
FDI	**-**	**-**	**3.6**	**7.8**	**12.1**	**13.2**	**-**
State (%)	16.2	15.9	11.8	15.7	17.3	18.5	-
Non State (%)	83.8	84.1	84.6	76.5	70.6	68.4	-
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	-
Total (Bill.VND)	1,739	1,851	1,903	2,104	2,327	2,546	-
Hai Duong							
FDI	**-**	**2.2**	**3.4**	**2.8**	**4.3**	**6.9**	**-**
State (%)	37.5	40.7	40.6	37.2	37.9	37.2	-
Non State (%)	62.5	57.1	56.1	60.0	57.8	55.8	-
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	-
Total (Bill.VND)	3,307	3,797	4,199	4,051	3,957	4,131	
Hai Phong							
FDI	**1.6**	**-**	**-**	**11.5**	**13.8**	**15.8**	**16.1**
State (%)	49.4	-	-	43.3	41.0	39.5	39.1
Non State (%)	49.0	-	-	45.2	45.2	44.8	44.9
Total (%)	100.0	-	-	100.0	100.0	100.0	100.0
Total (Bill.VND)	4,968	-	-	5,564	5,691	6,143	6,736
Vietnam							
FDI	**6.3**	**7.4**	**9.1**	**10.0**	**12.2**	**13.3**	**13.1**
State (%)	40.2	39.9	40.5	40.0	38.7	38.5	38.6
Non State (%)	53.5	52.7	50.4	50.0	49.0	48.2	48.3
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Bill.VND)	195,567	213,833	231,264	244,596	256,272	273,666	292,376

Source: DPIs of Hanoi, Hung Yen, Hai Duong and Hai Phong Peoples Committees, General Statistical Office

Figure 3.2.1.7: Structure of GDP of the 4 provinces by ownership



The shares of FDI are much impressive in the case of industrial gross output in these provinces (see Table 3.2.1.10, Figure 3.2.1.8). Over thirty percent of industrial output in 2002 was produced by FDI in Ha Noi. FDI in Hai Phong contributed nearly half of the provincial industrial output after 1999. In Hung Yen, moreover, foreign enterprises seem to be dominant producers of industrial goods, as over 70% of industrial output in the province was made by FDI in 2001. The shares of state enterprises, on the other hand, have been gradually reduced in all of the four provinces, particularly in Hai Phong.

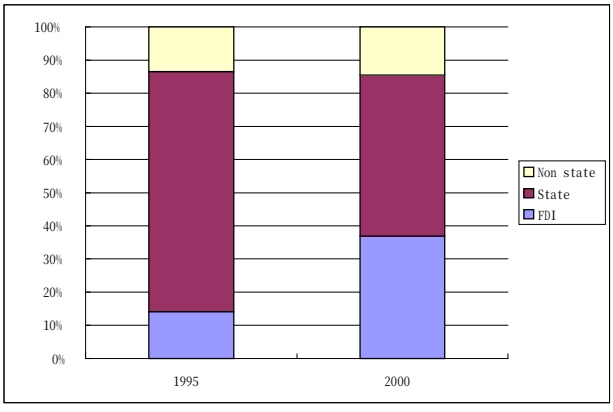
Table 3.2.1.10: Structure of provincial industrial gross output by ownership

(%, constant 1994 prices)

	1995	1996	1997	1998	1999	2000	2001
Hanoi							
FDI	**19.1**	**26.0**	**30.4**	**32.7**	**32.9**	**33.7**	**31.7**
State (%)	70.2	63.6	59.6	57.4	56.5	55.5	56.7
Non State (%)	10.8	10.4	10.0	9.9	10.6	10.8	11.6
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Bill.VND)	8,467	10,351	12,172	13,865	14,919	17,298	19,175
Hung Yen							
FDI	**-**	**7.0**	**35.0**	**53.2**	**72.5**	**70.9**	**-**
State (%)	31.6	29.2	20.3	12.8	6.7	6.3	-
Non State (%)	68.4	63.8	44.7	34.1	20.8	22.7	-
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	-
Total (Bill.VND)	249	328	519	804	1,736	2,115	-
Hai Duong							
FDI	**2.2**	**2.1**	**4.1**	**5.4**	**13.7**	**19.1**	**17.4**
State (%)	89.2	90.8	91.6	89.9	87.0	82.4	72.7
Non State (%)	17.7	16.4	15.0	14.9	17.1	15.0	17.2
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Bill.VND)	2,067	2,735	3,399	3,750	3,529	4,261	4,686
Hai Phong							
FDI	**11.7**	**9.4**	**41.0**	**46.2**	**48.2**	**49.0**	**45.0**
State (%)	74.1	58.5	43.3	38.5	33.1	30.5	29.0
Non State (%)	14.2	15.6	15.6	15.4	18.6	20.5	26.1
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Bill.VND)	3,013	3,780	5,395	6,191	7,212	8,709	10,497
Whole country							
FDI	**25.1**	**26.7**	**28.9**	**32.0**	**34.7**	**35.9**	**35.3**
State (%)	50.3	24.0	23.1	45.9	43.4	41.8	41.3
Non State (%)	24.6	49.3	48.0	22.1	21.9	22.2	23.5
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Bill.VND)	103,374	118,097	134,420	151,223	168,749	198,326	226,406

Source: DPIs of Hanoi, Hung Yen, Hai Duong and Hai Phong Peoples Committees, General Statistical Office

Figure 3.2.1.8: Structure of industrial gross output of the 4 provinces by ownership



These foreign enterprises, however, made less contribution to employment creation. Table 3.2.1.11 show the share of FDI in industrial labor force in the four provinces. Despite the significant share in the industrial output, foreign enterprises employ only a few percent of industrial workers in these provinces. This suggests that foreign enterprises are relatively capital intensive in comparison with domestic ones, and that productivity of workers in FDI factories should be higher than those working in local factories.

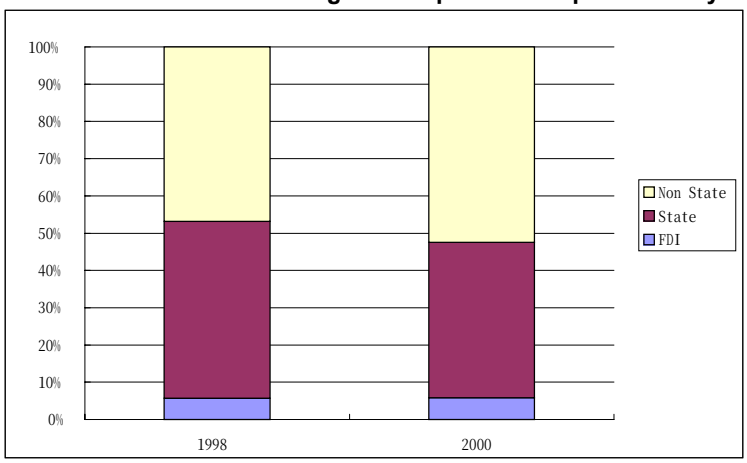
Table 3.2.1.11: Structure of provincial industrial labor forces by ownership

(%, Share in total)

	1995	1996	1997	1998	1999	2000	2001
Hanoi							
FDI	**4.2**	**6.6**	**5.9**	**6.2**	**6.6**	**6.0**	**5.9**
State	58.8	57.8	58.4	60.8	58.7	56.7	56.7
Non State	37.0	35.6	35.7	33.0	34.8	37.3	37.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (persons)	171,960	178,626	176,127	176,061	182,790	195,697	199,950
Hung Yen							
FDI	**-**	**-**	**-**	**2.5**	**-**	**3.2**	**-**
State	-	-	-	17.6	-	17.0	-
Non State	-	-	-	79.9	-	79.8	-
Total	-	-	-	100.0	-	100.0	-
Total (persons)	-	-	-	36,367	-	41,544	-
Hai Duong							
FDI	**-**	**1.7**	**1.7**	**2.6**	**3.1**	**3.2**	**2.8**
State	-	18.8	21.8	28.6	25.4	23.2	18.8
Non State	-	79.8	76.4	69.3	72.1	74.1	78.3
Total	-	100.0	100.0	100.0	100.0	100.0	100.0
Total (persons)	-	77,737	73,369	59,903	62,854	72,433	82,287
Hai Phong							
FDI	**3.8**	**-**	**-**	**8.6**	**8.9**	**8.3**	**8.4**
State	50.6	-	-	45.9	41.7	36.6	33.0
Non State	45.6	-	-	45.5	49.3	55.1	58.6
Total	100.0	-	-	100.0	100.0	100.0	100.0
Total (persons)	82,682	-	-	89,033	96,306	108,627	124,258

Source: DPIs of Hanoi, Hung Yen, Hai Duong and Hai Phong Peoples Committees, General Statistical Office

Figure 3.2.1.9: Structure of industrial gross output of the 4 provinces by ownership



3.2.1.4 Benefit of the improvement of the Highway No.5 and the Hai Phong port

The upgrading of Hai Phong port and the improvement in the Highway No.5 have brought about large benefit to FDI companies. As previously shown, many of FDI are export-oriented. Considering the fact that local supporting industries and raw material suppliers are not well developed, the export-oriented production should be accompanied with the increase in import. Improvement in the transport infrastructure should reduce the cost of transporting these imported inputs. Moreover, the current business model requires quick delivery to reduce inventory cost. Quick and frequent delivery of raw materials and final products is essential, and this is only facilitated by the development of road and port infrastructure. Hence, many FDI projects are heavily dependent on the Hai Phong port and the Highway No.5.

The improvement of the road infrastructure is meaningful not only for delivery of commodities but also for business trips between Ha Noi and Hai Phong. With the completion of the Highway No.5 project, it only takes around two hours to travel between the two cities by car. One day business trip between the two cities became much easier. Foreign enterprises located in Hai Phong, in particular, can easily receive clients or customers coming from Ha Noi, or from the Noi Bai airport. Foreign managers stationed in Hai Phong can easiliy have an access to business or social facilities in the capital city.

The frequency of utilization of these facilities differs by industrial sector and by company even in the same industrial sector (see Table 3.2.1.12). The frequency varies from once a day to only once or twice in a month. Every company interviewed admits that the improvement has brought about large benefit of reducing time for transportation of imported materials and export products from four hours before to one and half or two hours at present. In addition, the variation of the transportation time drastically became small. This enables the companies make production and sales schedule more sharply.

Table 3.2.1.12: Use of Highway No.5 and Hai Phong Port for FDI in Northern Viet Nam

FDI Type	Productioin Site	Main Market	Export channel	Import channel	Use of HP port	Use of HW5	Business examples
1	Ha Noi		Hai Phong	Hai Phong	XX	XX	OA products
2	Ha Noi	Local	Hai Phong	Hai Phong	XX	XX	sanitary ware
3	Ha Noi	Local		Hai Phong	XX	X	glass ware
4	Ha Noi		Internet				software
5	Ha Noi		Noi Bai	Hai Phong	X	X	electronic parts
6	Hai Phong		Hai Phong	Hai Phong	XX		clothes, bags
7	Hai Phong	Local		Hai Phong	XX	X	glass container
8	Hai Phong	Local	Hai Phong	Hai Phong	XXX	XX	heavy metal structure
9	Hai Phong		Noi Bai	Noi Bai		XX	jewely
10	Vinh Phuc	Local		Hai Phong	X	X	motorbike

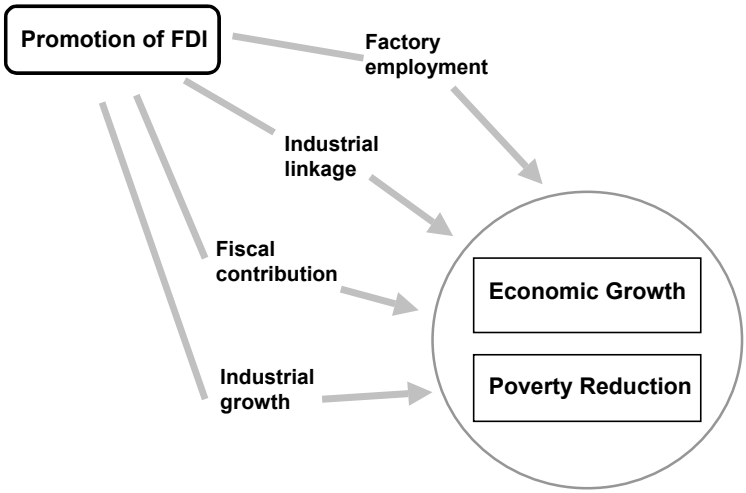
Note: X shows frequency of use.

The managers of foreign enterprises, however, also pointed out the recent problems about the use of the Highway No.5 and the Hai Phong port. Many traffic accidents are reported on the highway, and even a minor accicent causes serious traffic jam. Moreover, customers of Hai Phong port often complained about its limited capacity. Even after the port is upgraded, only less than 5,000 DWT vessels can make a call at the port due to the shallow water.

3.2.2 Path for growth and poverty reduction

This section examines the process of how FDI promotion could affect economic growth and poverty reduction in the area concerned. Impact from FDI promotion on economic growth and poverty reduction shall be examined from four viewpoints, which are industrial growth, creation of factory employment, linkage with local industry and fiscal contribution (Figure 3.2.2.1). The four paths shall be examined individually.

Figure 3.2.2.1: Four paths of FDI promotion to growth and poverty reduction



3.2.2.1 Creation of employment

FDI creates job opportunities. The number of employee may not be large at the initial stage. It takes at least one year to start operation after the grant of investment license. During this period, a limited number of people are employed for preparation of the opening. However, with the start of commercial operation, this number will increase over three to four years. The company would create further job opportunities when it succeeds in capturing and expanding markets for its products in line with the investment plan.

The number of employees in FDI companies in major industrial zones in Ha Noi and Hai Phong is shown in the following table.

Table 3.2.2.1: Number of workers in FDI firms in major industrial zones in Ha Noi and Hai Phong

(persons, 2003)

	Number of surveyed firms	Current empoyment	Expected new employment**
Thang Long*	14	3,766	3,184
Sai Dong B	-	5,867	-
Noi Bai	-	1,269	-
Nomura-Hai Phong*	9	3,017	2,530
Other surveyed*	21	7,969	2,756

Note: * Based on the result of company survey
** Those of 20 firms only, which disclosed the figures
Source: IDCJ, DPI of Hanoi Provincial Peoples Committee

FDI firms in the four major industrial zones employ 14,000 workers altogether. Many of them have a future expansion plan, and more staff shall be employed in a few years. Furthermore, it is reported that Matsushita Electrical has decided to move to Thang Long Industrial Park within this year. When the investment is realized, the impact on job creation is expected to be large. Considering the current development of investment, Thang Long Industrial Park Corporation expects that the total employment in Thang Long Industrial Park alone will reach 20,000.

A significant number of workforces are also employed in the newly invested foreign and domestic enterprises outside these major industrial zones. The provincial industrial zones along the Highway No, 5 have created significant employment opportunities as well. Hai Phong provinces, for instance, has fourteen industrial zones other than Nomura Hai Phong Industrial Zone. According to the provincial officials of Hai Phong, the FDIs in these industrial zones create around 30,000 jobs in the province. FDI in Hung Yen province also create lots of employment. The provincial DPI estimates that all foreign enterprises employ 5,800 workers. Domestic private enterprises also make substantial contribution to employment creation in the province. The number of workers employed in these private enterprises is estimated to be around 7,000.

In order to estimate the impact of FDI employment on the income of employees, a questionnaire survey was implemented for 240 employees working at a foreign enterprise in one of major industrial zones, including "Thang Long", "Sai Dong B", "Noi Bai" and "Nomura Hai Phong" (Table 3.2.2.2). Among the 240 staff members, 43% are factory workers, and 32% are employed as administrative staff. Others are working as factory supervisors or managers. The previous job experience of these employees seems various. Eleven percent of them have a previous experience as factory workers. Others were working on handicraft making, trade and service, etc. As much as 45% of them consider that their income is a very significant source for their household. The remaining 38% of them regard their income as "more or less significant".

Table 3.2.2.2: Sample Employees at Surveyed Foreign Enterprises

Current Position		
Factory worker	102	43%
Factory supervisor	9	4%
Administrative staff	76	32%
Manager/professional staff	43	18%
Others	10	4%
Total	240	100%
Previous Job experience		
Farming	1	0%
Handicraft	10	4%
Factory employment	26	11%
Trade & Services	10	4%
Government employee	13	5%
Others	47	20%
No experience	10	4%
No answer	123	51%
Total	240	100%
Significance in HH Income		
Very significant	107	45%
More or less significant	90	38%
Not significant	28	12%
No answer	15	6%
Total	240	100%

Source: CONCETTI

The importance of their income can be explained by other survey data. Table 3.2.2.3 and Figure 3.2.2.2 show the share of their income in the total household income of the family. It is surprising to see that the income from foreign invested enterprises consists of nearly half of the total family income of the employees on average. In the case of factory supervisors, their income is 60% of the total family income.

This table also compares their current income and the previous one. Figure 3.2.2.3 presents this comparison as well. On average, the current income from foreign enterprises is 13% higher than the income from the previous job. The current income of factory supervisors is particularly higher than that of their previous job. It is shown from this survey data that the cash income from foreign enterprises

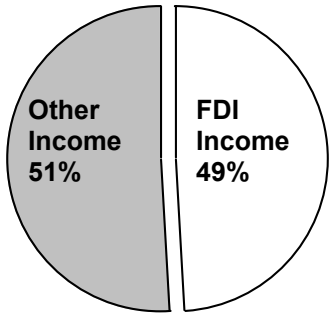
seems to be an extremely valuable source of revenue for not only the employees themselves but also for their families.

Table 3.2.2.3: Income Level of Employees at Surveyed Foreign Enterprises

	No. of Sample	Average curent income	Total HH income	Share in total HH income	Income from previous Job	Increase in income
	(person)	th.VND	th.VND	%	th.VND	%
		A	B	A/B	C	(A-C)/C
Factory worker	49	807	1,998	40%	660	18%
Factory supervisor	5	1,628	2,660	61%	780	52%
Administrative staff	31	2,007	3,848	52%	1,676	16%
Manager & professionals	28	2,507	4,504	56%	2,411	4%
Others	5	2,758	7,300	38%	2,586	6%
Total	118	1,643	3,354	49%	1,429	13%

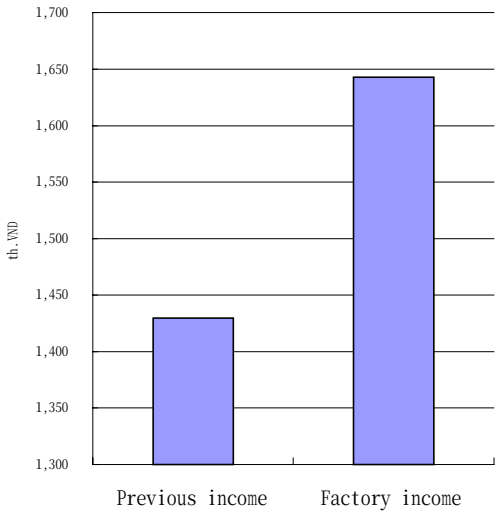
Source: CONCETTI

Figure 3.2.2.2: Structure of household income of surveyed FDI employees*



Note: Survey of 118 workers at foreign enterprises in the four provinces (Feb. – Mar. 2003)

Figure 3.2.2.3: Comparison of current and previous income of surveyed FDI employees*



Note: Survey of 118 workers at foreign enterprises in the four provinces (Feb. – Mar. 2003)

3.2.2.2 Development of supporting business

It is expected that foreign enterprises made economic linkages with local economy, and this linkage would promote more growth and poverty reduction. There are various kinds of supporting business for newly invested firms, such as the followings.

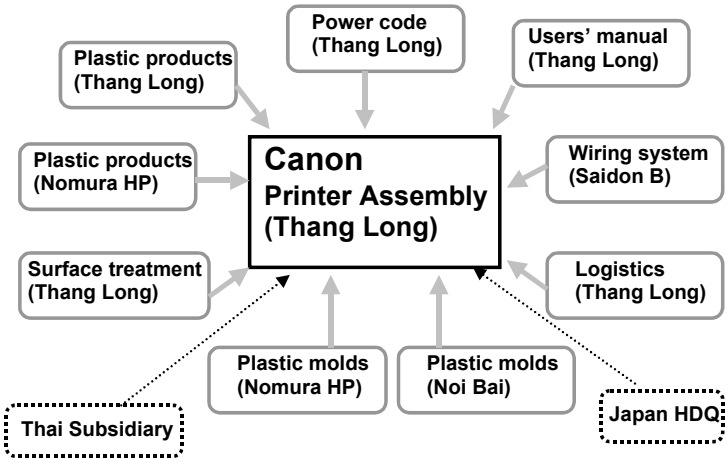
- Logistic service
- Catering service
- Real estate service (incl. Lodging for employees)
- Hotels and restaurant
- Glossary shops
- Financial and insurance service
- Medical service
- Guard service
- Office cleaning service
- Staff service
- Technical center service
- Office supply service

Our survey, however, does not provide us with clear evidence to show this linkage. Most FDIs have made very limited linkage with local economy, particularly with manufacturing sector. Many of local enterprises working for FDI are in service sector, such as transport.

In the case of resource-based investment such as food processing, foreign and new domestic enterprises in the industrial zones tend to have a significant business linkage with local farmers. There are many enterprises in the zones, manufacturing a variety of products such as frozen meat, instant noodle, livestock feed and so on. Local farmers supply a large quantity of raw materials to these manufacturers. Potatoes, onions, rice, vegetables and meat are some examples of such raw materials. Procurement of agricultural products by FDI is a stable and very important source of revenue for the local farmers.

One of the possibilities to strengthen the linkage with local manufacturing sector is the promotion of so-called "satellite investment" of foreign parts producers. For instance, after Canon opened a printer assembly line in Thang Long Industrial Park, a variety of parts suppliers came to invest in northern Viet Nam. These related investments would gradually increase the local value of the whole production. This is what happened in many industrial parks in neighboring ASEAN countries before.

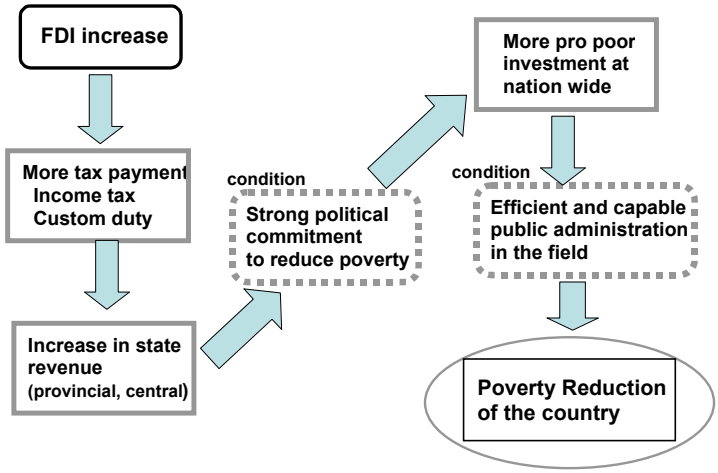
Figure 3.2.2.4: Satellite investments of FDI; "Canon effect"



3.2.2.3 Budgetary contribution

The last possible process would be through fiscal contribution of FDI. When FDI projects increase, we could expect more payment of income tax and customs duties from foreign enterprises. If the government has a strong political commitment to poverty reduction, the increased state revenue would result in more pro-poor investment nationwide. On condition that we have rather efficient and capable public administration to implement the pro-poor projects, the country shall be successful in reducing poverty (see Figure 3.2.2.5).

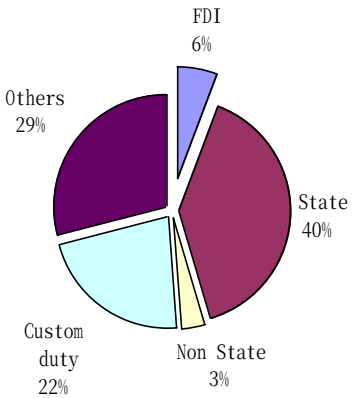
Figure 3.2.2.5: Conceptual flow of fiscal contribution of FDI to poverty reduction



Considering the expanding share of FDI in the current GDP, foreign enterprise sector might make substantial contribution to the increase in the state budget revenue. As a socialist country, the Vietnamese Government has clearly demonstrated its strong commitment to poverty reduction in many occasions. The creation of the CPRGS document is a notable example of this commitment. Therefore, it is highly expected that the recent massive inflow of FDI would make a substantial contribution to poverty reduction through the allocation of state budget.

Figure 3.2.2.6 shows the structure of combined state revenue of Ha Noi, Hai Phong, Hung Yen and Hai Duong, combined. The share of FDI is rather limited to 6% in 2000. This share was similar to that of the whole country, which is 7% in the same year.

Figure 3.2.2.6: Structure of the total state revenue of the four provinces in 2000



Source: Table 3.2.2.4

The limited share of FDI in the state revenue is also illustrated by Table 3.2.2.4. This table presents the structure of the recent state budget revenue from four provinces along the Highway No.5 as well as from the whole country. In Ha Noi, for instance, FDI's share in GRP was 15% in 2000, but its share in budget revenue was only 7%. The recent share of FDI in GRP was 16% in Hai Phong, but the tax from the FDI was only 4% of the provincial budget revenue.

Table 3.2.2.4: Structure of State Budget Revenue

(%, Share in total)	1995	1996	1997	1998	1999	2000	2001
Hanoi							
FDI	**-**	**-**	**6.6**	**7.1**	**5.8**	**6.4**	**7.0**
State	65.8	62.1	50.8	50.4	43.1	48.9	58.3
Non state	3.9	5.3	4.5	4.9	4.0	3.6	3.7
Agricultural land use	0.2	0.2	0.1	0.2	0.2	0.1	0.0
Custom duty*	5.4	7.3	5.0	6.1	7.3	6.2	12.1
Others	24.6	25.1	33.0	31.2	39.5	34.8	18.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (bill.VND)	7,152	8,563	10,063	10,773	10,984	12,437	15,106
Hung Yen							
FDI	-	-	**9.8**	**9.2**	**13.7**	**13.4**	-
State	-	-	10.0	7.0	4.8	5.3	-
Non state	-	-	6.0	4.8	3.3	4.0	-
Agricultural land use	-	-	23.0	17.4	12.0	11.2	-
Custom duty*	-	-	0.0	24.5	22.1	10.4	-
Others	-	-	51.3	37.1	44.0	55.7	-
Total**	-	-	100.0	100.0	100.0	100.0	-
Total (bill.VND)	-	-	133	225	290	292	-
Hai Duong							
FDI	-	-	**1.8**	**1.1**	**0.9**	**1.8**	**2.3**
State	-	-	51.6	45.5	41.3	35.0	31.5
Non state	-	-	4.1	3.5	4.1	3.5	4.6
Agricultural land use	-	-	8.6	8.1	8.7	6.5	1.3
Custom duty*	-	-	18.8	30.6	16.8	14.6	29.0
Others	-	-	15.1	11.3	28.1	38.6	31.3
Total**	-	-	100.0	100.0	100.0	100.0	100.0
Total (bill.VND)	-	-	518	674	575	715	821
Hai Phong							
FDI	**1.1**	**2.4**	**5.6**	**5.6**	**4.1**	**4.1**	**4.0**
State	13.6	16.9	18.6	20.8	11.4	11.8	10.9
Non state	2.6	3.4	4.2	3.9	2.5	2.4	2.2
Agricultural land use	0.8	1.2	1.2	1.5	0.9	0.8	0.3
Custom duty*	67.9	57.3	50.5	54.1	70.0	77.2	78.4
Others	14.0	18.8	19.8	14.1	11.0	3.7	4.2
Total**	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (bill.VND)	3,038	2,723	2,357	2,310	3,520	3,747	4,380
Whole country							
FDI	-	-	-	-	-	**7.3**	-
State	-	-	-	-	-	30.2	-
Non state	-	-	-	-	-	8.9	-
Agricultural land use	-	-	-	-	-	2.7	-
Custom duty*	-	-	-	-	-	29.1	-
Others	-	-	-	-	-	21.8	-
Total	-	-	-	-	-	100.0	-
Total (bill.VND)	-	-	-	-	-	65,187	-

Note: * including VAT on imports, ** excluding subsidy from the central government
Source: DPI of Hanoi, Hung Yen, Hai Duong and Hai Phong Peoples Committees, General Statistical O

This modest fiscal contribution of FDI was explained by the fact that a large part of foreign enterprises are at initial stage and do not generate much profit. Moreover, many of the enterprises are still enjoying tax holidays granted by the provincial authorities. It is, however, expected that FDI might have made significant budget contribution by paying customs duties. Most of foreign enterprises are deeply involved in foreign trade, by importing intermediate inputs and exporting final products. The recent national statistics shows that 45% of exports and 31% of imports were made by FDI in 2001 (see Table 3.2.2.5). The share of customs duties in the provincial state revenue of Hai Phong province was 78% in 2001. Considering the big share of FDI in foreign trade, a large part of the customs duties should have been paid by FDI. In all four provinces, the fiscal contribution of state enterprises and agriculture sector has reduced year by year. Non - state sector still plays a modest role in generating the government revenue. Therefore, it is expected that FDI would play an increasingly important role in generating revenue for the government. In this way, FDI would indirectly contribute to the national objective of poverty reduction, by increasing the state budget revenue.

Table 3.2.2.5: Share of Trade by ownership

Export	1995	1998	1999	2000	2001
FDI	**27.0**	**34.3**	**40.6**	**47.0**	**45.2**
Domestic	73.0	65.7	59.4	53.0	54.8
Total	100.0	100.0	100.0	100.0	100.0
Total (mill. USD)	5,449	9,360	11,541	14,483	15,027
Import	1995	1995	1995	1995	1995
FDI	**18.0**	**23.2**	**28.8**	**27.8**	**30.8**
Domestic	82.0	76.8	71.2	72.2	69.2
Total	100.0	100.0	100.0	100.0	100.0
Total (mill. USD)	8,155	11,500	11,742	15,637	16,162

Source: Statistical Yearbook 2001, General Statistical Office.

3.2.2.4 Quantitative assessment of the growth impact

The quantitative impact of the regional FDI on the national and regional economic growth is estimated using the methodology based on the Cobb-Douglas production function. The actual value of GDP is compared with the estimated value of GDP with limited FDI inflow to the four provinces along the Highway No. 5, which are Ha Noi, Hung Yen, Hai Duong and Hai Phong.

Firstly, the macro economic model was estimated before simulating the amount of GDP. The so-called GDP function is estimated using the macro economic data of the country. GDP is described in the following function.

$$Yt = f(Kt, Lt, Dt)$$

where
Yt: constant value of GDP in the year t
Kt: amount of capital stock in the year t, including both private and government capital
Lt: number of labor force in the year t
Dt: dummy variable to show the impact of technological development or productivity growth
I_t: the total amount of investment in the year t

The values of dummy variables are obtained from the previous research work of Nghiep and Quy (Nghiep and Quy 2000[1]). As the data about the capital stock is not available, this figure was estimated using the

[1] Nghiep, Le Thanh and Quy, Le Huu (2000). "Measuring the impact of Doi Moi on Vietnam's Gross Domestic Product", *Asian Economic Journal* 14 (3): 317-332.

following equation, assuming that the rate of depreciation of capital stock is 8%.

$$K_t = K_{t-1} \times 0.92 + I_t$$

Based on the estimation of the IDCJ study (IDCJ 2002[2]) using the Cobb-Douglas function, the following equation was obtained. Figures in bracket show the standard errors. The estimated and actual amounts of GDP are compared in Table 3.2.2.6. Each coefficient is statistically significant and meaningful.

$$\text{LogY} = 5.34657 + 0.343184 \log K + 0.656816 \log L + 0.028132 D$$
$$(0.185594)\ (0.022386) \qquad (0.002105)$$
$$R^2 = 0.99908$$

Table 3.2.2.7 presents the result of the estimation of capital stock assuming that the four provinces have received a very limited number of FDIs. From the mid 1990s, a significant amount of foreign capital was invested to the four provinces. On the basis of the finding of the foreign enterprises survey, it is supposed that 90% of these foreign enterprises in the four provinces would not have come to this region without the improvement of the Highway No.5 and the Hai Phong Port. In fact, it seems that ninety percent of these newly invested foreign enterprises extensively use the two transport facilities when trading the products or raw material. Others are using the Noi Bai airport to transport their products. The new amount of capital stock (K*) of the country is estimated on the assumption that only ten percent of the existing FDI came to the region.

Using the new amount of capital stock (K*), the new amount of GDP (Y*) is estimated using the same GDP function (see Table 3.2.2.8). The newly estimated amount of GDP (Y*) is smaller than the actual amount, because the smaller amount of capital stock (K*) was used in the function.

Table 3.2.2.6: Estimation of the GDP function of Viet Nam

	Constant94 Bill.VND Whole country	Million person Whole country			Dummy on Tech.dev		Estimate Whole country	Constant94 Actual Whole country
	K	L	Log K	Log L	D	Log Y	Y (GDP)	Y (GDP)
1986	121,200	30.4	11.71	3.41	0	11.61	109,784	109,189
1987	127,623	31.2	11.76	3.44	0	11.64	113,669	113,154
1988	140,443	32.1	11.85	3.47	0	11.69	119,680	119,960
1989	147,970	32.9	11.90	3.49	0.5	11.74	125,584	125,571
1990	153,561	33.8	11.94	3.52	1	11.79	131,301	131,968
1991	161,705	34.7	11.99	3.55	2	11.85	139,857	139,634
1992	175,473	35.4	12.08	3.57	3	11.92	149,892	151,782
1993	202,284	36.2	12.22	3.59	4	12.01	164,271	164,043
1994	231,610	36.9	12.35	3.61	5	12.10	179,234	178,534
1995	266,329	37.7	12.49	3.63	6	12.19	196,144	195,567
1996	305,845	38.6	12.63	3.65	7	12.28	214,853	213,833
1997	347,902	39.2	12.76	3.67	7.5	12.35	230,066	231,264
1998	386,159	39.8	12.86	3.68	8	12.41	244,255	244,596
1999	421,141	40.4	12.95	3.70	8.5	12.46	257,719	256272
2000	462,463	41.0	13.04	3.71	9	12.52	272,527	273666
2001	512,187	*41.6*	13.15	3.73	9	12.56	285,022	292376
2002	557,933	*42.2*	13.23	3.74	9	12.60	296,398	*n.a.*

Note: Kt = Kt-1x0.92 + It. LogY = 5.34657 + 0.343184 log K + 0.656816 log L + 0.028132 D
GDP and GRP in 2002 are estimates. R_2 = 0.99908

[2] IDCJ, (2002), *Country Evaluation Report: Vietnam*, commissioned by Ministry of Foreign Affairs, the Government of Japan (in Japanese).

Table 3.2.2.7: Estimation of the amount of Capital with limited FDI inflow to Red River Delta

	Constant94 Bill.VND	Constant94 Bill.VND	Constant94 Bill.VND FDI (90%)	Constant94 Bill.VND FDI (90%)	Constant94 Bill.VND FDI	Current Bill.VND FDI
		Whole country	4 provinces	4 provinces	4 provinces	4 provinces
	K* (K-△K)	K	ΔK	B(A x0.9)	A	
1986	121,200	121,200	0	0	0	0
1987	127,623	127,623	0	0	0	0
1988	140,443	140,443	0	0	0	0
1989	147,545	147,970	425	462	514	282
1990	153,065	153,561	496	77	86	47
1991	158,883	161,705	2,822	2,366	2,629	1,444
1992	165,933	175,473	9,540	6,944	7,716	5,632
1993	183,823	202,284	18,461	9,684	10,760	9,253
1994	206,303	231,610	25,307	8,323	9,247	9,247
1995	234,481	266,329	31,848	7,110	7,900	9,243
1996	273,238	305,845	32,607	3,307	3,674	4,666
1997	315,313	347,902	32,589	2,591	2,879	3,915
1998	352,631	386,159	33,528	1,021	1,134	1,678
1999	389,952	421,141	31,189	343	381	594
2000	433,554	462,463	28,909	216	240	386
2001	484,584	512,187	27,603	1,006	1,118	1,856
2002	532,215	557,933	25,718	324	360	616

Note: △Kt = △Kt-1 + Bt

Table 3.2.2.8: Estimation of GDP with limited FDI inflow to Red River Delta

	Constant94 Bill.VND Whole country	Million person Whole country			Dummy on Tech.dev		Estimate Whole country
	K*	L	Log K*	Log L	D	Log Y*	Y*(GDP)
1986	121,200	30.4	11.71	3.41	0	11.61	109,784
1987	127,623	31.2	11.76	3.44	0	11.64	113,669
1988	140,443	32.1	11.85	3.47	0	11.69	119,680
1989	147,545	32.9	11.90	3.49	0.5	11.74	125,460
1990	153,065	33.8	11.94	3.52	1	11.78	131,156
1991	158,883	34.7	11.98	3.55	2	11.84	139,015
1992	165,933	35.4	12.02	3.57	3	11.90	147,043
1993	183,823	36.2	12.12	3.59	4	11.98	158,964
1994	206,303	36.9	12.24	3.61	5	12.06	172,256
1995	234,481	37.7	12.37	3.63	6	12.14	187,755
1996	273,238	38.6	12.52	3.65	7	12.24	206,699
1997	315,313	39.2	12.66	3.67	7.5	12.31	222,430
1998	352,631	39.8	12.77	3.68	8	12.37	236,759
1999	389,952	40.4	12.87	3.70	8.5	12.43	251,002
2000	433,554	41.0	12.98	3.71	9	12.49	266,556
2001	484,584	*41.6*	13.09	3.73	9	12.54	279,654
2002	532,215	*42.2*	13.18	3.74	9	12.58	291,636

The comparison of the actual GDP with the newly estimated GDP is presented in Table 3.2.2.9. It is shown that the estimated GDP would become 1.6% lower than the actual, when the four provinces received only 10% of the existing FDI in 2002. This suggests that the actual inflow of FDI increased the GDP of the country by 1.6% in this year. It is moreover assumed that the economic impact of FDI to the four provinces should be concentrated on the economy in the Red River Delta. Based on the same quantitative data, the impact of the FDI on the economic growth of the region is also estimated. It is shown that the Gross Regional Product (GRP) of the Red River Delta would be 7.9% lower in 2002 with limited inflow of FDI to the region. This suggests that the contribution of the existing FDI to the increase in GRP in the region was 7.9% in the year.

The impact of the two JBIC loans on the national and regional economic growth is also estimated without considering their effect of FDI promotion (Table 3.2.2.9). The amount of FDI to the region was replaced with that of two JBIC loans in the same GDP function. It is shown that the direct monetary contribution of the loans is rather limited. It raised the GDP of the country by 0.2% in 2002. The GRP of the Red River Delta was increased by 0.8% in the year. The contribution to the two JBIC projects to the economic growth would be considered as the combination of these direct and indirect impacts.

Table 3.2.2.9: Impact of Regional FDI on Economic Growth

(billion VND, Constant 1994 prices)

	GDP Whole country	GDP with limited regional FDI*	Impact on Whole country	GRP Red River Delta	Impact on Red River Delta
	Actual A	Estimate B	(A-B)/A	Actual C	(A-B)/C
1995	196,144	187,755	**4.3%**	37,451	**22.4%**
1996	214,853	206,699	**3.8%**	40,629	**20.1%**
1997	230,066	222,430	**3.3%**	44,132	**17.3%**
1998	244,255	236,759	**3.1%**	46,697	**16.1%**
1999	257,719	251,002	**2.6%**	48,634	**13.8%**
2000	272,527	266,556	**2.2%**	52,455	**11.4%**
2001	285,022	279,654	**1.9%**	56,126	**9.6%**
2002**	296,398	291,636	**1.6%**	60,055	**7.9%**

Table 3.2.2.10: Impact of two JBIC loans on Economic Growth without indirect effect of FDI promotion

(billion VND, Constant 1994 prices)

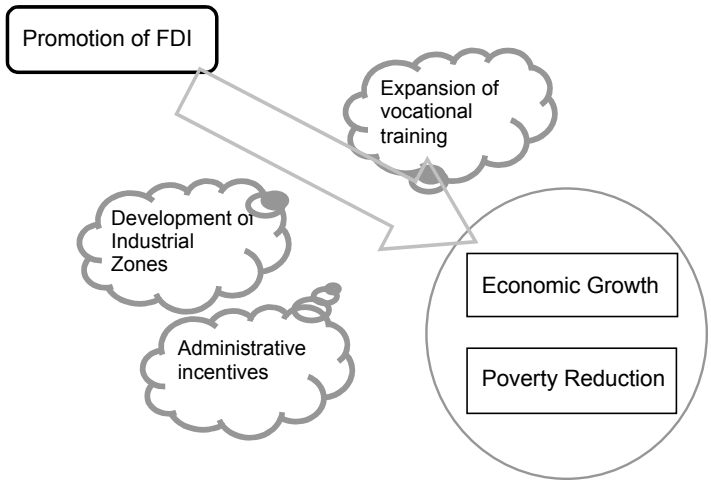
	GDP Whole country	GDP without JBIC Loans to two projects*	Impact on Whole country	GRP Red River Delta	Impact on Red River Delta
	Actual A	Estimate B	(A-B)/A	Actual C	(A-B)/C
1995	196,144	195,417	**0.4%**	37,451	**1.9%**
1996	214,853	214,215	**0.3%**	40,629	**1.6%**
1997	230,066	229,514	**0.2%**	44,132	**1.3%**
1998	244,255	243,770	**0.2%**	46,697	**1.0%**
1999	257,719	257,040	**0.3%**	48,634	**1.4%**
2000	272,527	271,927	**0.2%**	52,455	**1.1%**
2001	285,022	284,500	**0.2%**	56,126	**0.9%**
2002**	296,398	295,940	**0.2%**	60,055	**0.8%**

Note: * Highway No.5 rehabilitation project and Hai Phong port rehabilitation project
** GDP and GRP in 2002 are estimates.

3.2.3 Concurrent Interventions and Surrounding Environment

The improvement of transport infrastructure alone should not have caused economic growth and poverty reduction. Concurrent interventions or some external factors are also of primary importance. These concurrent interventions should include expansion of vocational training programs, development of industrial zones, as well as introduction of administrative incentives for new investors (Figure 3.2.3.1).

Figure 3.2.3.1: Concept of the concurrent interventions for FDI promotion



3.2.3.1 Expansion of vocational training programs

Vocational training programs in the four provinces have been actively expanded recently and many of the graduates have become industrial workers in the newly invested foreign and domestic enterprises along the Highway No.5. Hai Duong Province, for instance, currently has twenty-three vocational schools, and over six thousand students graduate from these schools each year. The number of vocational schools increased by nine in the last two years only. Hung Yen Province also has thirteen vocational schools and adds five thousand graduates to the local industry each year. The province expanded the number of school from eight to thirteen over the last five years.

The recent expansion of the training programs in the two provinces is very impressive, and the newly invested foreign and domestic enterprises greatly benefit from the revised programs. There seem several reasons why the two provinces can expand the program within a limited period. First, the provinces are very close to Ha Noi, and it is relatively easy for them to attract students and to recruit teaching staff. During the war against the US, moreover, a number of higher educational institutions, including vocational schools, were evacuated from Ha Noi to the two provinces. Both provinces are also densely populated with over 1 million inhabitants who are sufficiently educated as well. Hai Duong and Hung Yen provinces are among the first eight provinces of the country, which achieved universal secondary education in 2001. There are enough secondary school leavers to be trained at vocational schools.

Various ministries of the central government have established their own vocational schools in the two provinces. In Hai Duong province, for example, the Ministry of Trade has one vocational school that provides training for trade business. Moreover, mechanics and electricians are trained in schools managed by the Ministry of Construction and the Ministry of Industries respectively. The Ministry of Transport has one driving school and one school for seafarers. Students of these vocational schools were selected from all over the country, and many of the graduates have been employed in SOEs affiliated to the ministry concerned. These centrally managed vocational schools, therefore, could not fully satisfy the increasing demands for workers by newly invested foreign and domestic enterprises along the Highway No.5.

In order to meet the demands of these enterprises, new types of vocational schools have been recently

established by provincial authorities, social organizations and private companies. One typical example is the establishment of the Technical Training College of the Hai Duong Provincial People's Committee, in 2000. The college is located in Ai Quoc Commune in Nam Sach District; just beside the Highway No.5, and expected to provide trained labor forces to newly invested foreign and domestic enterprises in the province, in particular. The college has short-term courses from six to twelve months, and long-term courses from six months to twenty-four months. The numbers of annual incoming students are two hundred for the short-term courses, and three hundred for the long ones. Currently, the following four courses are being conducted.

Sewing (6 to 18 months)
Mechanics (12 to 24 months)
Electrical (12 to 24 months)
Welding (12 to 24 months)

The sewing course has the highest local demand among the four. The college has eleven full-time, and forty part-time teachers. The tuition fee of the short-term course of the sewing program is 180,000 VND ($12) per month. The fee of long-term course is 4.3 million VND ($287) per year. The tuition fee is usually subsidized by the Government. In many cases, the local enterprises bear the training expense of students on conditions that the college should supply a certain number of graduates to the enterprises. The budget of the college increased in the last two years, and the provincial authority is planning to expand the program in the near future.

Table 3.2.3.1: Budget of the Technical Training College of the Hai Duong Province

2001: 5.9 billion VND		
of which		
	2.6 billion VND:	Subsidy from the provincial government
	0.7 billion VND:	Subsidy from the central government
	2.6 billion VND:	Student fees and contribution from enterprises
2002: VND 8.7 billion		
Of which		
	4.2 billion VND	Subsidy from the provincial government
	1.5 billion VND	Subsidy from the central government
	3.0 billion VND	Student fees and contribution from enterprises

Source: Department of Labor, Hai Duong Provincial People's Committee

3.2.3.2 Development of industrial zones

(1) Industrial Zones with License from the Central Government

In Viet Nam, there exist seventy-nine industrial zones, which were established by the licenses issued the central government. Their regional distribution is given in the following table, with the distribution of registered year. It is estimated that these industrial zones employ around 414 thousand people. Most of these industrial zones were developed in the three years of 1996-1998, which is regarded as the first boom. When these zones became available, the Asian financial crisis occurred and FDI to the country got severely stagnated. The second boom of industrial zone development appeared in 2002.

There are several industrial zones in the North region with four major zones: Thang Long Industrial Park, Nomura Hai Phong Industrial Zone, Noi Bai Industrial Zone and Sai Dong B Industrial Zone. All of them are located between Ha Noi and Hai Phong cities. The major characteristics for these four zones are:

Thang Long:	Joint venture of Japan and Viet Nam
Nomura-Hai Phong:	Joint venture of Japan and Viet Nam
Noi Bai:	Joint venture of Malaysia and Viet Nam
Saidong B:	Joint venture of Korea and Viet Nam

Basically each development partner conducts marketing activities to companies of its own country. The above three countries are among the major foreign investors in Viet Nam.

These industrial zones between Ha Noi and Hai Phong started the development after 1994. The completion of these industrial zones coincided with the Asian financial crisis, so the development corporations felt difficulty in attracting investors to their zones. However, the environment changed

after 2000, and the zones started attracting lots of investors. This change is shown in the following table.

Table 3.2.3.2: Licensed Industrial Zones in Viet Nam (As of March, 2003)

	Province	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
South	Dong Nai				1	3	1	2	2		1				10
	BR-VT						2		2			1	2		7
	Ba Ria-Vung Tau					1	4	1				2	1		9
	HCM CIty	1	1				3	7					1	1	14
	Dong Thap								1						1
	Long An							2						1	3
	Can Tho				1										1
	Dak Lak												1		1
	Tay Ninh									1			1		2
	(Sub-total)	(1)	(1)		(2)	(4)	(10)	(12)	(5)	(1)	(1)	(3)	(6)	(2)	(48)
Central	Da Nang				1			1	1						3
	Quang Nam						1	1	1						3
	Thua Thien Hue								1						1
	Khanh Hoa							1							1
	Binh Thuan								1						1
	Phu Yen								1						1
	Binh Dinh								1						1
	(Sub-total)				(1)		(1)	(3)	(6)						(11)
North	Thanh Hoa								1						1
	Nghe An								1						1
	Ha Tinh												1		1
	Ha Noi				1	1	2	1							5
	Hai Phong				1			2							3
	Quang Ninh							1							1
	Ha Tay												1		1
	Bac Ninh								1				1		2
	Vinh Phuc								1						1
	Thai Binh									1			1		2
	Tien Giang							1							1
	Phu Tho							1							1
	(sub-total)				(2)	(1)	(2)	(6)	(4)	(1)			(4)		(20)
Total		1	1		5	5	13	21	15	2	1	3	10	2	79

Source: MPI

An industrial zone or park provides various services to foreign investors, including supports to obtain investment licenses or to recruit initial staff members. If these tasks have to be undertaken by investors themselves, they have to find their own staff for the tasks. This manning should offset the cost advantage gained from investment in Viet Nam. In addition, as the basic infrastructure, such as electricity and water supply, is already available, investors do not worry about the infrastructure. Moreover, investors are able to make a quick start of operation by moving to a "standard factory". Customs clearance is easy because the government officers for the clearance are often stationed inside the zone. Investors are also entitled to enjoy several financial advantages such as tax exemption. The availability of such industrial zone was an important factor for investors to select investment sites. However, unless the transportation infrastructure linking the zone to the port is improved, investors feel inconvenient in settling their factories in the industrial zone. Only when the basic transportation infrastructure is well developed, the industrial zone can attract investors.

Table 3.2.3.3: No. of FDI in the industrial zone and park locating alongside Highway No.5

	Thang Long IP	Noibai IZ	Nomura- Hai Phong IZ	Saidon B*
1993				1
1994			1	1
1995				5
1996	1		3	1
1997	1	3	1	1
1998				
1999			2	1
2000	2			3
2001	6	2	5	4
2002	13	2	12	5
2003	N.A.	N.A.	4	2

Note: * Excluding the expansion by two companies in 2002 and 2003
Source: IDCJ

(2) Industrial Zones under the Provincial Management

There are a significant number of industrial zones, which are managed by local authorities, possibly provincial people's committees. Hai Phong People's Committee has developed 15 industrial zones in the province. Hung Yen and Hai Duong People's Committees also developed a few industrial zones in their provinces (see attached Figures).

Hung Yen Provincial authority has developed five industrial zones and planned one zone so far.

1) Nhu Quynh 56ha
2) Pho Noi A 390ha
3) Pho Noi B 200ha
4) Minh Duc 200ha
5) Hung Yen Town 62ha
6) Doan Dao (planned)

Nhu Quynh, Pho Noi A, Pho Noi B and Minh Duc zones are all located on the Highway No.5, and the Hung Yen Town zone is located in the provincial capital, which is 30km south of the highway. Doan Dao zone shall be located in Phu Chu District, which is poor and far from both the highway and the provincial capital. Potential investors in this industrial zone are considered to be local SMEs and handicraft manufacturers.

Hai Duong Provincial People's Committee has the following five industrial zones. Cam Dien, Dai An, Nam Dong and Phu Thai zones are located along the Highway No.5, and Hoang Tan - Hoang Tien zone is on Highway No. 18 that connects Ha Noi and Ha Long. All of them have good access to both Ha Noi and seaports.

1) Cam Dien 87ha
2) Dai An 170ha
3) Nam Dong 63ha
4) Phu Thai 60ha
5) Hoang Tan - Hoang Tien 158ha

The provincial authorities provided basic infrastructure services to the enterprises in the industrial zones. The authorities also help foreign investors sort out all administrative procedures with their one-window service. Unlike the above mentioned joint venture industrial zones, however, foreign enterprises located in the provincial zones could not receive accommodating management supports including logistics. Many of newly invested enterprises in these zones are, in fact, domestic capital.

Figure 3.2.3.2: Hung Yen; Map of Industrial Zones

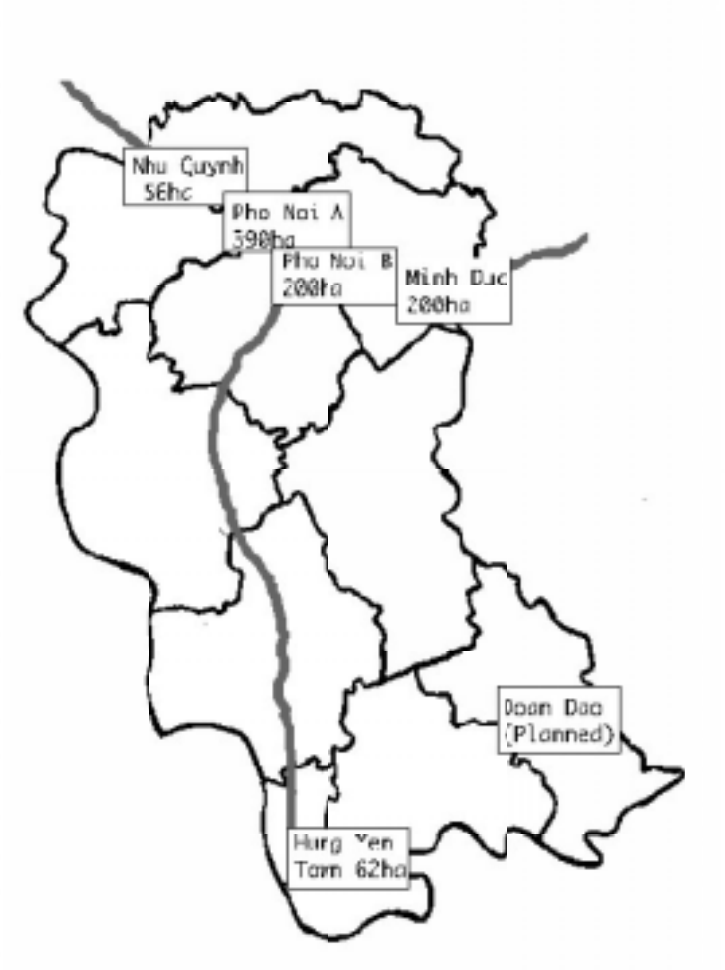
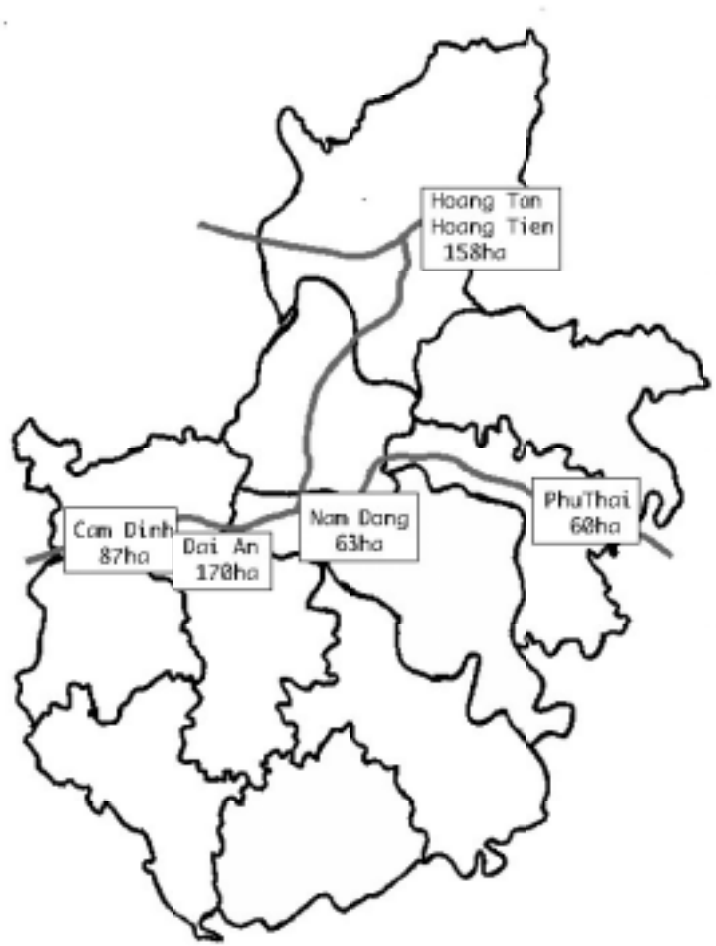


Figure 3.2.3.3: Hai Duong; Map of Industrial Zones



3.2.3.3 Administrative incentives

(1) FDI Laws

Government policies have played a key role in promoting FDI. In Viet Nam, such economic policies as economic liberalization and promotion of market economy contributed to the improvement of the investment climate. Potential investors felt that business opportunity in Viet Nam became large to the extent that could justify their investments. Major laws and policies related to FDI promotion are examined as follows.

(a) 1987 Law
The introduction of foreign investment policy by the Government of Viet Nam goes back to 1987. In that year, the Government promulgated for the first time "The law on Foreign Investment in Vietnam". It consists of six Chapters -- General Provisions, Forms of investment, Investment guarantee measures, Rights and obligations of foreign organizations and individuals, State body in charge of foreign investment, and Final provisions. The number of Articles in the law is 42. In this law, as for the forms of investment, 100% foreign owned capital is allowed, so are joint venture and contractual business cooperation. In case of joint venture, the minimum capital contribution by foreign parties is set at 30%. The unique article is Article 13, which states that "All principal matters which relate to the organization and operation of the joint venture, namely its business objectives, business planning, and key personnel, shall be determined by a unanimous decision of the board of management". Also, Article 15 states, "The duration of an enterprise with foreign owned capital shall not exceed twenty (20) years. Where necessary, the duration may be extended for a longer period".

(b) 1990 Law
The 1987 Law on foreign investment was amended and some phrases were added in 1990. However, there was no substantial change besides the way of selecting the board of management.

(c) 1992 Law
The 1987 Law was amended and several phrases were added again in 1992. In this amendment, new concepts of "Export Processing Zone" and "Export processing enterprise" were introduced for the first time. Export processing enterprises are entitled to enjoy some fiscal incentives such as exemption from payment of duties for goods, which are exported from and imported into the export processing zones, and preferential taxes.

(d) 1996 Law
Incorporating the past amendment in the Law of 1987, 1990 and 1992, a new law was enacted in 1996.

(e) FDI promotional policy in 1999
Faced to the sharp decline in the FDI to Viet Nam caused by the Asian financial crisis, the Viet Nam Government adopted a new policy for attracting FDI. The policy covers the following areas.

- -- Prices of goods and services: Public utility price and charges: power selling price, telecommunications prices and charges and price of clean water
- -- Wages of Vietnamese laborers working in foreign-invested enterprises
- -- Issue of work permits
- -- Recruitment and training of laborers
- -- A number of supplementary measures on investment promotion

(f) 2000 Law
In 2000, FDI law was revised again. The purpose lies in improving investment climate as much as possible. The improvement includes the lift of regulation on reserve requirement, the reduction of tax on profit remittance and introduction of new registration system. Among them, the last one was highly welcome by foreign investors.

One Chapter of the Law stipulates the procedure of getting investment licenses. In general, investors have to get investment licenses from Ministry of Planning and Investment (MPI). In the process, an investor have to submit a report on the feasibility study. MPI and parties concerned assess the

investment application including the feasibility study and issue the investment license (Article 104, 105, 107, 108,109,110 and 111). However, foreign companies can start their business without getting any permission when they meet one of the following conditions-- 1) 100% export, 2) comply with MPI's requirements on the export ratio set by industrial zone and 3) investment is less than US $5 million and export ratio is more than 80%.(Article 105 and 106). The impact is considered large. Since the investment satisfying the above conditions is not refused to issue an investment license by MPI, there is no need to submit any feasibility study reports.

(2) Incentives by Provincial Authorities

Based on the regulation of FDI laws, the provincial people's committees have offered a variety of incentives to potential foreign investors. Provincial authorities of Hai Phong, Hung Yen or Hai Duong provinces, for instance, present the following incentives to foreign investors.

- One window service
- Reduction of rent
- Subsidy for site clearance
- Exemption and following reduction of corporate income tax
- Subsidy for vocational training of the staff

It is possible for the provincial authority to change the extent of those incentives within the scope of the relevant laws and decrees. By offering better conditions, the authority tries to attract foreign investors to relatively undeveloped area in the region. Investors coming to the southern part of Hung Yen province, for instance, can enjoy reduction of rent for a much longer period.

Box.1: A Metal Mechanical Products Manufacturer in Hung yen

" Immediately after Highway No.5 was improved, they moved their factory from Ha Noi to the alongside of the Highway in Hung Yen"

The company is a Vietnamese private company established in 1995 with a capital of US$2.3 million. They manufacture cubicles, kiosk substation, composite boxes and mechanical products. Total number of employee is 250. 30% of their products are exported to Sweden and Hong Kong, and the rest 70% are directed to the domestic market. In 1995 the company established their factory in Ha Noi but immediately after Highway No.5 was improved, it moved to Pho Noi in Hung Yen, 29km from Ha Noi. The reason of the movement is as follows. First, the space of the Ha Noi factory was so small with only 1,000 square meters, while the new factory has a space of 45,000 square meters. Second, the new place is near to Hai Phong port. Third, it is convenient to transport their products to all over Vietnam. Forth, Hung Yen province is of less corruption and is good at settling matters very quickly. Fifth, facing Highway No.5, advertisement becomes easier. Every company wants to have a seat along Highway No.5 for this reason. Therefore, there is no more room for constructing a new factory. All of the open space along Highway No.5 has already been reserved by companies who plan to move into the alongside of Highway No.5.

Box. 2: A Motorcycle Parts Manufacturer in Hung Yen

"The infrastructure development is not keeping pace with the development of economy in Vietnam"

The company was established as a joint venture with Thailand(40%), Vietnam(30%) and Laos(30%) in 1997. The capital is US$ 15 million and their investment up to now reaches US$39 million. The number of employee is 1,300. Their business is to manufacture motorcycle parts such as exhaust system and supply them to motorcycle assemblers. They are located in the middle of Ha Noi and Hai Phong. It is important to be near Ha Noi because it is convenient for negotiations with the Government. On the other hand, it is also advantageous to be situated near Hai Phong port as much as possible because they import raw materials such as steel, chemicals and parts of motorcycles. The improvement of Highway No.5 made a great contribution to the regional economy. However, the infrastructure development is not keeping pace with the development of the Vietnamese economy. Since the economic development is fast, Highway No.5 already became small. In saddition, it is not keeping pace with the people's education for transportation rule. The Ministry of Transportation has just begun to regulate the loading capacity of trucks in order to maintain the quality of Highway No.5.

Box. 3 : An Office Machine Manufacturer in Ha Noi

:"Improvement of the transportation infrastructure was one of important factors for decision making to invest in the North"
The company is a 100% subsidiary of a worldwide known camera and office machine manufacturer in Japan. The Vietnam factory was established in April 2001. The Vietnam factory is the newest one among their overseas production facilities. They cite following reasons for investment in Vietnam:

- Availability of labor with high quality working under low cost and long working hours (legally maximum 2,440 hours per year)
- Geographical advantage that Vietnam is located between China and Asian countries
- Market potential with a population of 77 million
- Risk aversion from too much concentration of production on China.

It was in 1997 that the company began to consider the investment in Vietnam. They conducted a feasibility study for their investment, but the underdeveloped infrastructure did not justify the investment since their business involves a huge amount of exports and imports. In 2000, they conducted the study again and at that time got information that even though the infrastructure condition was not still far from satisfactory, the situation was improved enough to justify their investment in the North. Especially, they assess that Highway No.5 was improved to a great extent.

Box 4: A Metal Fabrication Company in Hai Pong

" If there had not been the improvement in Highway No.5, their investment would have been made in other areas than Hai Phong."
The Korean and Vietnamese joint venture company was founded in 1995 with a capital of US$ 26 million. They employ 500 people. Their business is to fabricate various type of metal structure for thermal power plants, hydropower plants, bridges and piers. Around 30% of their products are exported to Japan, Thailand and Mexico. Steel used for fabrication is imported from Japan, Singapore and Korea through Hai Phong port. The Vietnamese Government recommended the company to establish their factory in the North in accordance with their industrial policy that heavy industry should be developed in the North. Among various candidates of the site, both partners chose the current site because the Vietnamese partner owned the land there. The improvement of Highway No.5 was one of decisive factors for the selection of the plant site. If there had not been news of the improvement, the investment would not have been materialized, they say. Both partners had a long time to negotiate on the plant site, but the Korean partner agreed to invest there in only three months as soon as the improvement of the infrastructure was confirmed. This tells us how important the improvement was to their business development.

Box. 5: A Car Assembler in Hai Duong

" Many new companies moved into alongside of Highway No.5"
The US and Vietnamese joint venture company was established in 1996 with a capital of US$120 million. Total investment is US$70 million. Production volume in the last year was 3,1 00 units and they could record profit with such volume. The total number of employee is 400. Their business is assembly of automobile components and parts imported from Japan, Europe and USA. They sell 100% of their products to the domestic market. HCMC holds around 50% shares of the total market and other areas including Ha Noi hold the rest 50%. Speculating that the Vietnam market would expand at relatively high pace, the company invested in Vietnam. In selecting the location of the factory, it became a key factor that the current site is alongside of Highway No.5. Even though the road condition was poor at the time, compared with other trunk road, Highway No.5 was much better. The improvement in the infrastructure has brought about various impacts. Transportation became more convenient. The company is one of frequent users of Highway No.5. They transport their imported materials three times a week with six to seven 40feet containers each time. They transport their finished products every day on Highway No.5 to Ha Noi and from there to HCMC on Highway No.1. However, traffic accidents increased though accidents, say, per 10,000 automobiles and motorcycles, are decreasing. The problem is that though Highway No.5 is called "Highway", actually, not only automobiles but also motorcycles, and even people and animals share the road. There seems a problem in its design. It is no doubt that due to enhanced convenience, many new companies moved to alongside of Highway No.5.

Box. 6: Tableware Manufacturing Company in Hung Yen

" When we moved into this Pho Noi A industrial zone, in 2000, only one company existed, but in the past two years, nine new companies joined the zone"
The100% Korean company was established in 2000 with a capital of US$ 7 million. They produce tableware such as knives and forks for export markets with 800 workers. They locate in Pho Noi A industrial zone, which is not official zone but prepared by Hung Yen Province. They decided to move into the zone for the following reasons. First, it is near both Ha Noi and Hai Phong. Second, Hung Yen Province was so eager to invite them. Third, their production process was labor intensive and it was easy to recruit labors with relatively low cost. When the company moved into the industrial zone in 2000, only one company existed. However, in the past two years, nine new companies joined the zone. In the next year, the zone will become full with other investors.

Box. 7: A Plastic Mold Manufacturing Company in Hai Phong

"If there had not been improvement in the infrastructure, they would not have selected the North for their investment site"
The Japanese company was established in 2002 with an investment of US$2.5 million. Their main business is to manufacture plastic molds for Japanese mechanical appliance manufacturers in Vietnam. After investing in China, they looked for another source for overseas production. They analyzed and compared the investment viability in Malaysia, Thailand and the Philippines and Vietnam. Finally, Vietnam was selected as the investment location. Positive factors for Vietnam were their economic growth potential, many Japanese corporation's investments such as Toyota and Canon, advantages in labor cost factor, and availability of labor with high quality. Among various investment sites in Vietnam, they decided to follow their Japanese clients' investment. Infrastructure in Highway No.5 was largely improved. If there had not been the improvement, they would not have decided to invest in the North of Vietnam, they say.

Box. 8: A Jewelry Company in Hai Phong

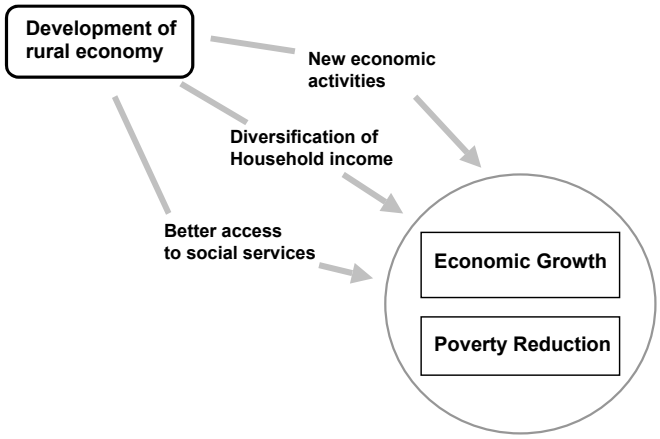
"Vietnam will become a new world-wide production base of our company"
The Japanese company's business is to produce jewelry by importing materials such as diamond and ruby from Japan. They export 100% of their products to Japan by air cargo from Noi Bai international airport since the products are very precious to be able to afford the air transportation cost. The production of jewelry is labor intensive in the whole process from designing, die making, cutting and pressing, trimming, polishing to inspection. Since the process is almost the same as in Japan, the low labor cost is one of sources of profit. The company looked for a new foreign production base since Japanese production cost is too expensive to survive the current deflationary economic situation and persistent cost pressure. They compared China, Thailand, Taiwan and Singapore and Vietnam. They finally decided to invest in Vietnam for the following reasons. First, Vietnamese people are diligent and fit for doing small job such as jewelry production. Second, labor cost is so cheap in Vietnam. Third, the economy in HCMC is "bubbled" and the cost of living is hiking. Since Vietnam is fit for their production, their parent company is now considering to expand the Vietnam's factory as a main one overseas. They speculate that the number of employee will expand from the current 200 to 2000 in the coming 2-3 years. They say the infrastructure improvement contributed to the improvement of their business's certainty because they can schedule their shipment to Noi Bai easily. Before the improvement, the time required to bring their products to the airport was not certain.

3.3 Impact from Rural Development

Three pigs transported on the Highway No.5

The impact of rural development on economic growth and poverty reduction shall be examined from three viewpoints in this section, which are expansion of new economic activities, diversification of household income and better access to social service (see Figure 3.3.1.1).

Figure 3.3.1.1: Three viewpoints about the impact of rural development



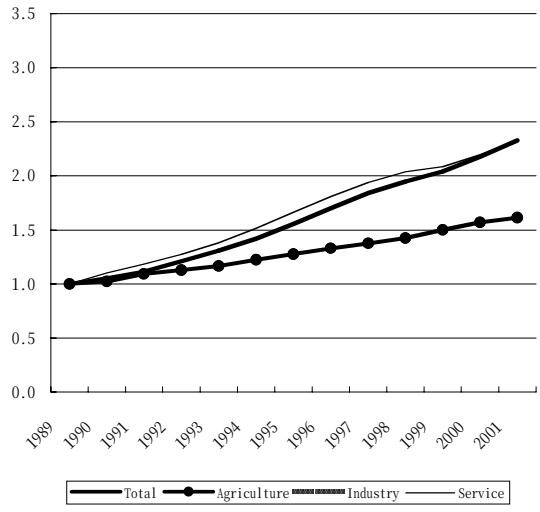
This section firstly looks at the overall trend of agricultural development in the country and that in the Red River Delta region. Then, the section presents the results of rural household survey in the provinces along the Highway No.5, which were implemented from February to March 2003.

3.3.1 Agricultural Development in the Red River Delta

3.3.1.1 Trends in Agricultural Development in Viet Nam

Figure 3.3.1.2 shows the trend of GDP growth by sector in constant prices. The values of GDP from 1990 to 2001 were expressed in the ratios to that in1989. Industry had the highest growth in this period, and the value of industrial output tripled by 2001. The growth of agricultural output was moderate in comparison with those of other sectors. The agricultural output increased by 1.5 times during ten years.

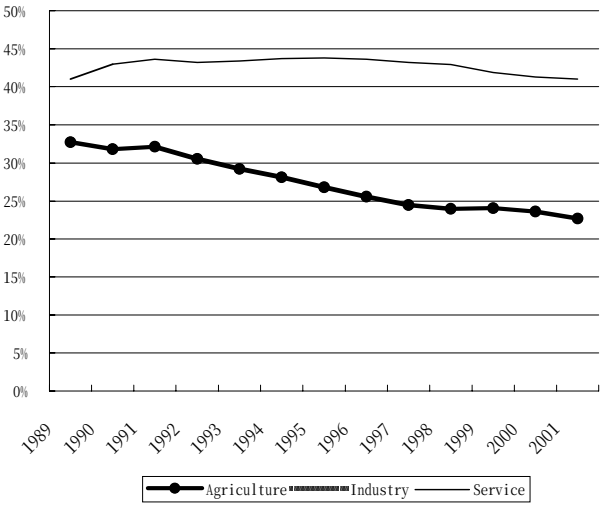
Figure 3.3.1.2: GDP Growth by sector in Viet Nam
(constant price)



Source: Statistical Yearbook in 2001, General Statistical Office

Due to these different growth rates, the share of agriculture, forestry and fisheries in GDP kept declining in the 1990s (see Figure 3.3.1.3). It decreased from 33% in 1989 to 23% in 2001. Despite this reduction in the share, agricultural sector still made up of one fourth of GDP in 2001 while the share of industry substantially increased from 26% to 37% during the period, instead.

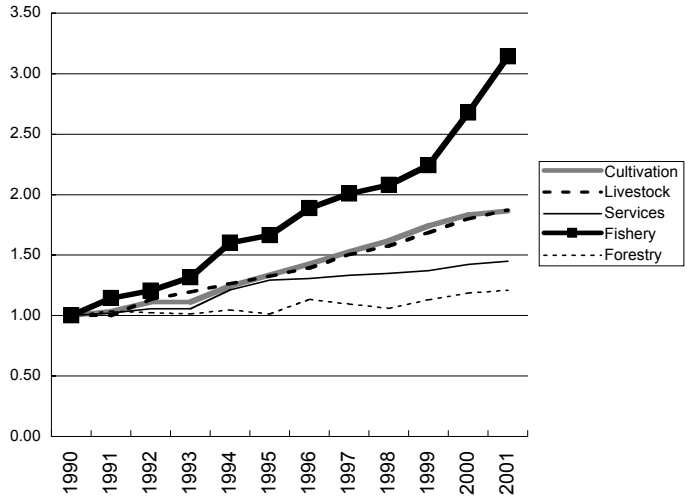
Figure 3.3.1.3: Changes in the structure of GDP by sector in Viet Nam



Source: Statistical Yearbook in 2001, General Statistical Office

In order to look into the structural change in the agricultural sector, it is necessary to see the composition of agricultural production of the country. Figure 3.3.1.4 presents the recent change in the growth rate of agriculture by type of products between 1990 and 2001. The values of annual production for each product type are shown as the ratio to those in 1990. It is clearly shown that fisheries production had the highest growth rate during the period. The value of production in 2001 was over three times larger than that in 1990. The growth of livestock production remained lower than that of fisheries and similar to that of cultivation. It seems that fisheries production is one of the important driving forces of the recent agricultural growth.

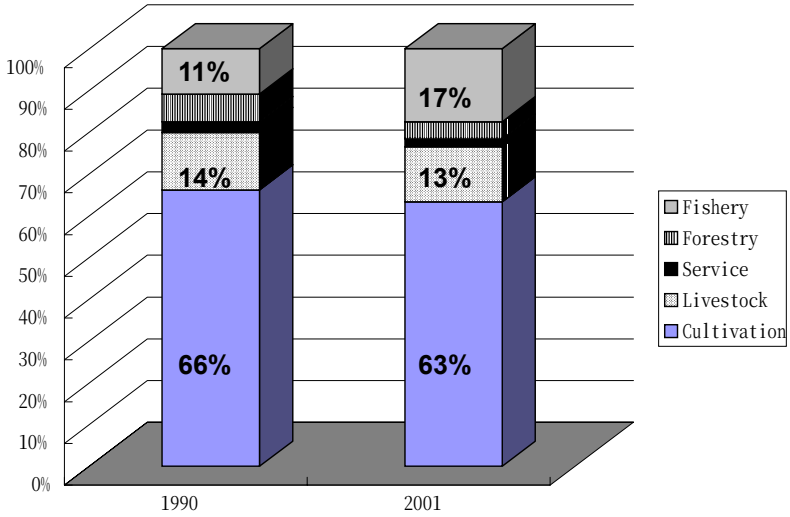
Figure 3.3.1.4: Growth index of agricultural output by product type in Viet Nam
(constant price)



Source: Statistical Yearbook in 2001, General Statistical Office

Due to the significant growth of the fisheries production, the fisheries gained a bigger share in the agricultural gross output in the 1990s (see Figure 3.3.1.5), increasing from 11% in 1990 to 17% in 2001, whereas the share of cultivation slightly decreased from 66% to 63% during this period. That of livestock production remained unchanged.

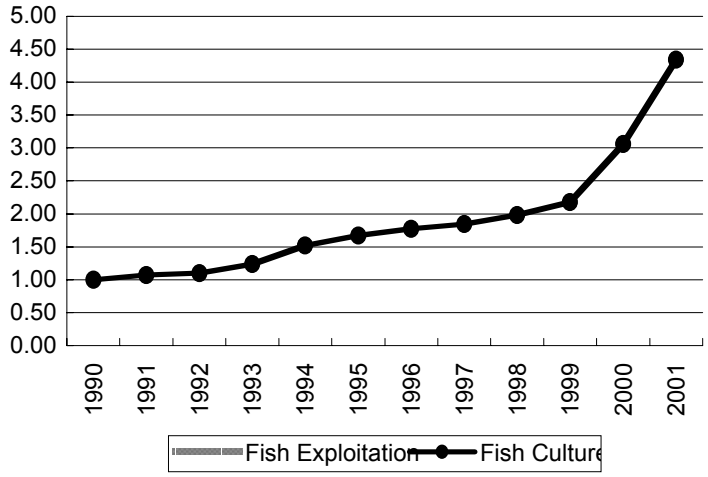
Figure 3.3.1.5: Structure of agricultural output by product type in Viet Nam



Source: Statistical Yearbook in 2001, General Statistical Office

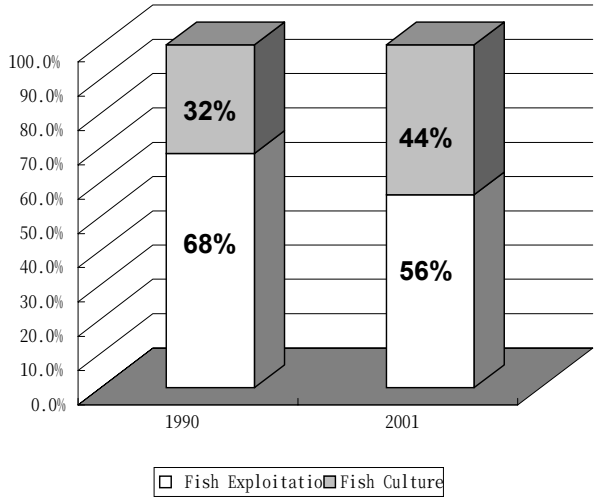
Fisheries sector is composed of fish exploitation and fish culture. Figure 3.3.1.6 presents the growth of the two types of fisheries production from 1990 to 2001. Between the two types, fisheries culture had a much higher growth rate after 2000. In 2001, the amount of fish culture production was 4.5 times larger than that of ten years ago. So, the share of fish culture production rose significantly in total fisheries production, from 32% to 44% during the period (see Figure 3.3.1.7).

Figure 3.3.1.6: Growth index of fisheries production in Viet Nam
(constant price)



Source: Statistical Yearbook in 2001, General Statistical Office

Figure 3.3.1.7: Change in the structure of fishery production in Viet Nam



Source: Statistical Yearbook in 2001, General Statistical Office

3.3.1.2 Trends in Agricultural Development in the Red River Delta area

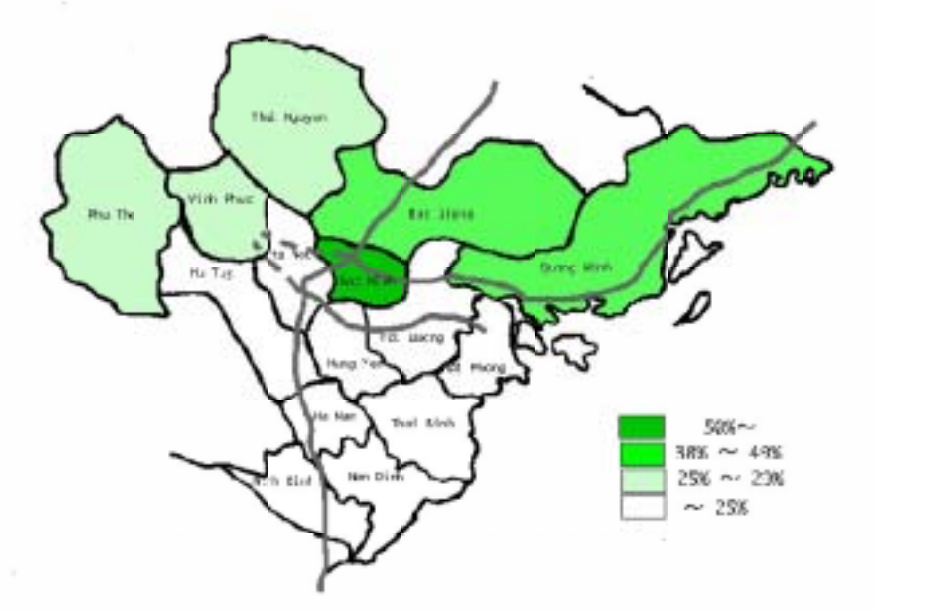
Table 3.3.1.1 shows the trend in the recent agricultural output for selected provinces in the northern Viet Nam from 1995 to 2000. Thai Binh, Ha Tay, Hai Duong and Nam Dinh are major agricultural producers in this area. With regard to the growth rate in this period, Bac Ninh had the highest growth rate, followed by Bac Giang, Quang Ninh and Phu Tho. Provinces located to the north of this area tended to have higher agricultural growth rate in the late 1990s (see Figure 3.3.1.8). The reasons for this trend were not certain.

Table 3.3.1.1: Trend in agricultural output by province in northern Viet Nam

	1995	1998	1999	2000	Growth 95-00
Hanoi	890	1,072	1,092	1,143	28%
Hai Phong	1,329	1,580	1,640	1,699	28%
Vinh Phuc	911	1,041	1,105	1,201	32%
Ha Tay	2,300	2,710	2,847	2,947	28%
Bac Ninh	851	1,152	1,203	1,319	55%
Hai Duong	1,982	2,361	2,461	2,536	28%
Hung Yen	1,483	1,765	1,852	1,897	28%
Ha Nam	917	1,111	1,113	1,119	22%
Nam Dinh	2,011	2,292	2,446	2,489	24%
Thai Binh	2,969	3,239	3,332	3,356	13%
Ninh Binh	923	1,080	1,159	1,191	29%
Thai Nguyen	766	872	926	997	30%
Phu Tho	864	1,005	1,064	1,163	35%
Bac Giang	1,424	1,701	1,807	1,960	38%
Quang Ninh	483	596	636	666	38%
Vietnam	82,307	99,096	106,368	112,112	36%
Red River Delta	16,576	19,402	20,251	20,898	26%

Source: Statistical Yearbook in 2001, General Statistical Office

Figure 3.3.1.8: Agricultural growth rate by province from 1995 to 2000 in northern Viet Nam



Source: Table 3.3.1.1

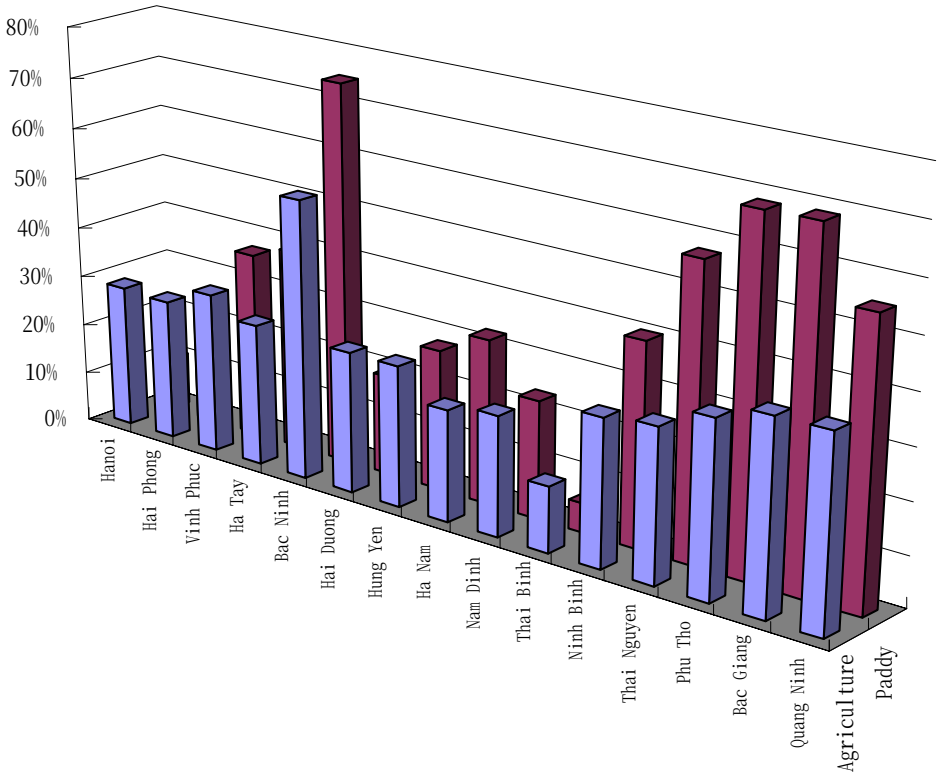
Viet Nam is one of the major rice producers and exporters in the world, and rice cultivation is the most popular agricultural production in the country. The Red River Delta region is the second largest producer of paddy rice in the country next to the Mekong River Delta region. The growth of paddy output should be much related to the growth of whole agricultural output. Table 3.3.1.2 presents the trend of paddy output by province in northern Viet Nam from 1995 to 2001. Bac Ninh had the highest growth rate of paddy production, then came Bac Giang and Phu Tho. The correlation between the growth rate of paddy production and the overall agricultural production is described in Figure 3.3.1.9. Those provinces with higher growth rate of paddy production also seem to achieve the higher growth of agricultural production. However, we could find several provinces with relatively high agricultural growth rate but without high growth rate of paddy production, such as Ha Noi and Hai Duong. There should be some other factors to explain the recent agricultural development in northern Viet Nam. Considering the recent rapid growth of fisheries output, that of culture fish in particular, fisheries production should have also made a substantial contribution on the agricultural growth in the area.

Table 3.3.1.2: Trend in paddy output by province in northern Viet Nam

	1995	1998	1999	2000	2001	Growth 95-00
Hanoi	177	200	208	225	196	11%
Hai Phong	396	439	471	490	490	24%
Vinh Phuc	217	263	275	327	298	37%
Ha Tay	647	788	877	921	904	40%
Bac Ninh	250	352	388	441	437	75%
Hai Duong	665	779	811	824	797	20%
Hung Yen	395	474	509	530	505	28%
Ha Nam	299	359	383	386	397	32%
Nam Dinh	787	952	974	966	971	23%
Thai Binh	940	969	1,060	1,051	994	6%
Ninh Binh	317	405	429	427	444	40%
Thai Nguyen	179	225	248	266	283	57%
Phu Tho	184	216	241	282	309	68%
Bac Giang	288	376	416	473	485	69%
Quang Ninh	117	152	160	176	181	55%
Vietnam	24,964	29,146	31,394	32,530	31,970	28%
Red River Delta	5,090	5,979	6,383	6,587	6,430	26%

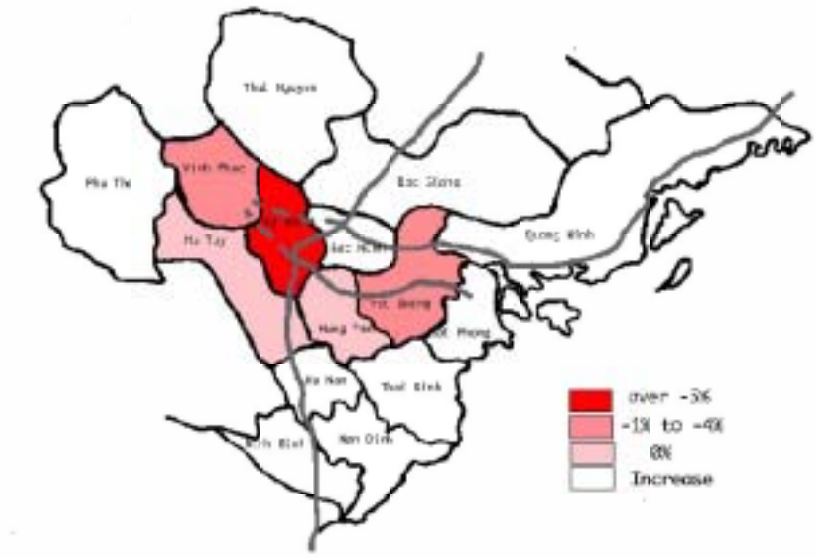
Source: Statistical Yearbook in 2001, General Statistical Office

Figure 3.3.1.9: Growth rate of paddy and agricultural production between 1995 and 2000 for selected provinces in northern Viet Nam



Source: Table 3.3.1.1 and Table 3.3.1.2

Figure 3.3.1.10: Reduction in planted area of paddy by province from 1995 to 2001

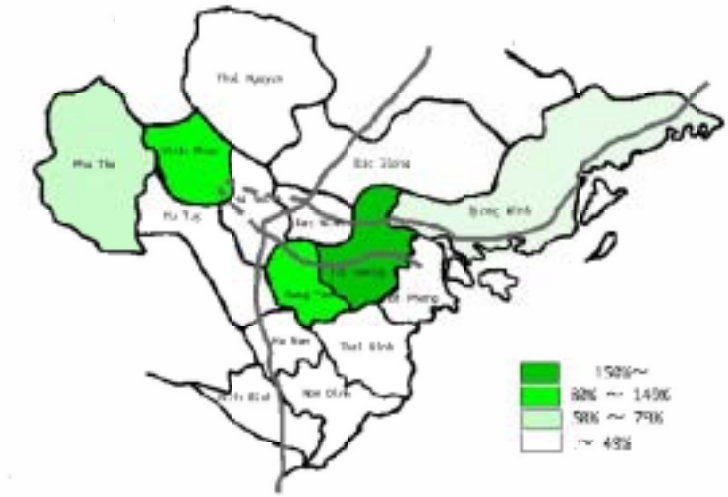


Source: Statistical Yearbook in 2001, General Statistical Office

Many provinces in the Red River Delta region increased the planted area of paddy in the 1990s. There were, however, some provinces that reduced the size of paddy field in this period. Figure 3.3.1.10 presents the change in the size of planted area of paddy between 1995 and 2001. It is clearly shown that

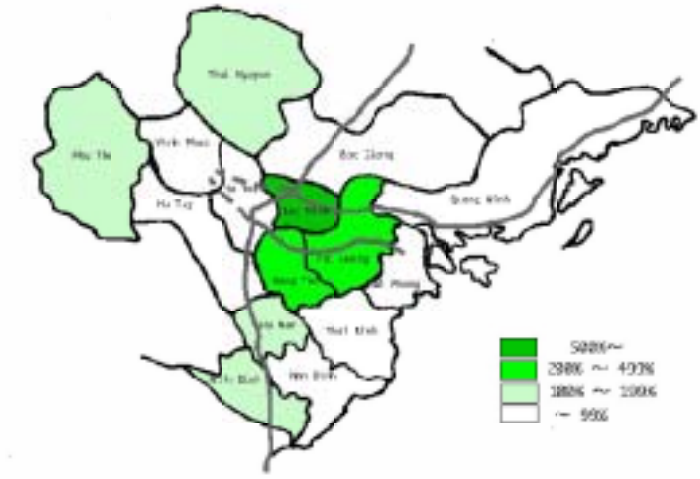
Ha Noi and its surrounding provinces particularly reduced the paddy fields in this period. Ha Noi reduced the paddy fields by 7%, followed by Hai Duong and Vinh Phuc. These provinces are mostly located along the Ha Noi - Hai Phong transport corridor. We could point out many reasons for the reduction of paddy field in these provinces, such as urbanization or industrialization. As previously pointed out in this report, a number of industrial zones have been newly developed in the provinces along Highway No.5, for instance. Considering the rapid growth of fisheries production, however, it is also supposed that a large part of the paddy fields should be transformed into fish ponds. Figure 3.1.1.11 shows the changes in the area of water surface for aquaculture by provinces from 1995 to 2001. As expected, the provinces along the Ha Noi - Hai Phong transport corridor increased the aquaculture areas to a large extent. Hai Duong, for instance, expanded its pond area by 164% in six years. Vinh Phuc and Hung Yen provinces also increased the pond area considerably. Provinces that significantly expanded the aquaculture area also had higher growth of fisheries production (see Figure 3.3.12). Bac Ninh, Hai Duong and Hung Yen are the major producers of fish in the Red River Delta region. From these observations, it is supposed that many farmers have transformed paddy fields into fish ponds and expanded fisheries production over the last few years. This structural change seems much accelerated in the provinces along the Ha Noi - Hai Phong transport corridor, such as Hung Yen or Hai Duong.

Figure 3.3.1.11: Change in area of water surface for aquaculture by province from 1995 to 2001



Source: Statistical Yearbook in 2001, General Statistical Office

Figure 3.3.1.12: Change in gross output of aquaculture by province from 1995 to 2001

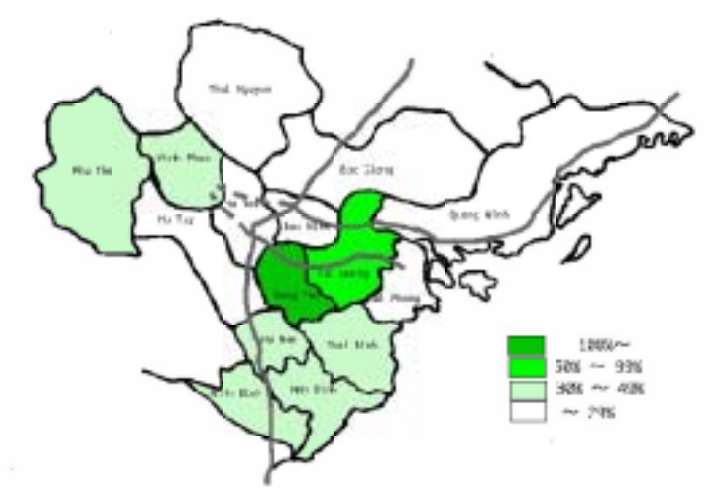


Source: Statistical Yearbook in 2001, General Statistical Office

For reference, the recent growth of livestock production in northern Viet Nam is shown in the following figures. Figure 3.3.1.13 presents the change in number of poultry by province from 1995 to 1999, and Figure 3.3.1.14 presents the same data for pigs. Just like the trend of aquaculture production, the provinces along the Ha Noi - Hai Phong transport corridor had the largest growth of poultry production during the period. Hung Yen, for instance, doubled the number of poultry in four years. Hai Duong also increased the production by 64%. The recent improvement of Highway No.5 might have promoted the poultry production in these provinces.

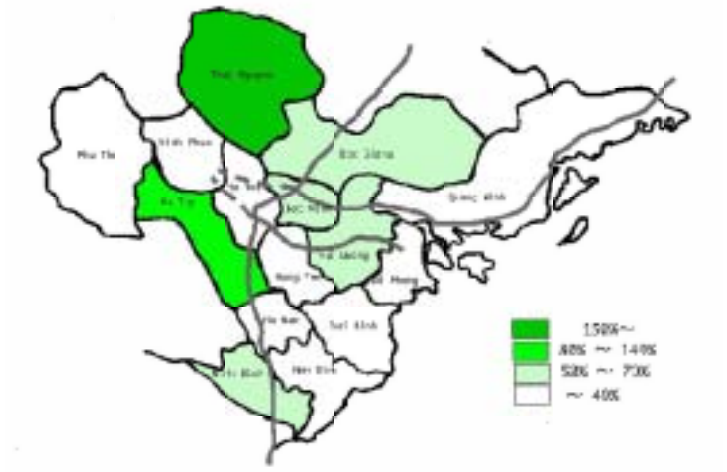
The breeding of pigs, however, does not have anything to do with the improvement of Highway No.5. Thai Nguyen and Ha Tay are the two major producers of pigs in northern Viet Nam. From the information in this study, we are not able to identify the factors that explain the different distribution of pig and poultry breeding business.

Figure 3.3.1.13: Change in number of poultry by province from 1995 to 1999



Source: Statistical Yearbook in 2001, General Statistical Office

Figure 3.3.1.14: Change in number of pigs by province from 1995 to 2001



Source: Statistical Yearbook in 2001, General Statistical Office

3.3.2 Rural Development in the Provinces along the Highway No.5 - Results of Socio-Economic Survey in Hung Yen and Hai Duong-

In order to see the impact from rural development, the study particularly focuses on the rural economy of the two provinces along the Highway No.5, which are Hung Yen and Hai Duong. It is expected that rural households in these provinces should have made a significant transformation of their business structure, and that the improvement of Highway No.5 and Hai Phong port should have played a large role in this process. Ha Noi and Hai Phong should have made a significant transformation of the rural economy as well. However, it might be difficult to focus on the impact of the two infrastructure projects alone, because the two big cities received various kinds of socio-economic interventions besides the Highway No.5 and Hai Phong port.

One of the main sources of information for this analysis is the rural household survey implemented in March this year. From six communes in Hai Duong and Hung Yen, around 200 households were randomly selected, paying attention to their poverty level. Features of the surveyed communes shall be described first as follows.

3.3.2.1 Features of Surveyed Communes

(1) Surveyed Communes in Hai Duong

Cam Doai Commune / Cam Giang District

Cam Giang District is located alongside the Highway No.5 that crosses the district for 10 km long. The district attracts investment in industries. One of the major changes in rural areas is the shift from paddy production to fisheries, livestock and vegetable production in rural households. Last year, more than 300 ha of paddy production areas was converted to fisheries areas. The incidences of traffic accidents were increased. The district provides traffic education such as teaching regulations before motorbike driving exams and IEC (information, education and communication) at schools..

Cam Doai Commune is located 2 km away from Highway No.5. It is noted that income per capita increased dramatically to be doubled from 2.2 million dongs in 1999 to 4.05 million dongs in 2000. This is caused by the transformation from paddy production to fisheries. The share of fisheries in income sources grew from 17 % in 1997 to 35 % in 2002. The number of households engaged in aquaculture also increased from a few HHs in 1997, to 200 HHs in 1999 and 360 HHs now. They sell fish to traders from Ha Noi or Hai Phong who come to the commune. Livestock and vegetable productions are not developed as compared to fish culture. The problem they face is that that the commune is divided by Highway No.5. 360,000m^2 is on the other side of Highway No.5, and people go to the other side every day, while there is no flyover around the commune. Consequently, there is 1 to 2 accidents a year. Therefore, flyovers are needed around the commune. The number of motorbike increased rapidly from about 25 (3% of HH) in 1997 to 400 (50 % of HH) in 2002.

Lai Vu Commune / Kim Thanh District

Kim Thanh is also located alongside Highway No.5, and Highway No.5 crosses the district for 18 km. This district has better access to Hai Phong rather than Ha Noi: 25 minutes to Hai Phong and 1 hour to Ha Noi by motorbike. The shift from paddy production to livestock, fisheries and vegetable and fruits productions is observed. Turtle production increased from 1999, and currently engaging 400 HHs. They sell turtles to traders from Hai Phong and Quang Ninh, and turtles are partly consumed domestically and partly exported to China. Pig raising has also been promoted. There are several family-operated slaughtering houses in Phu Thai town, the capital of the district. Lychee production also increased from 1999.

Figure 3.3.2.1: Hung Yen, Surveyed Communes

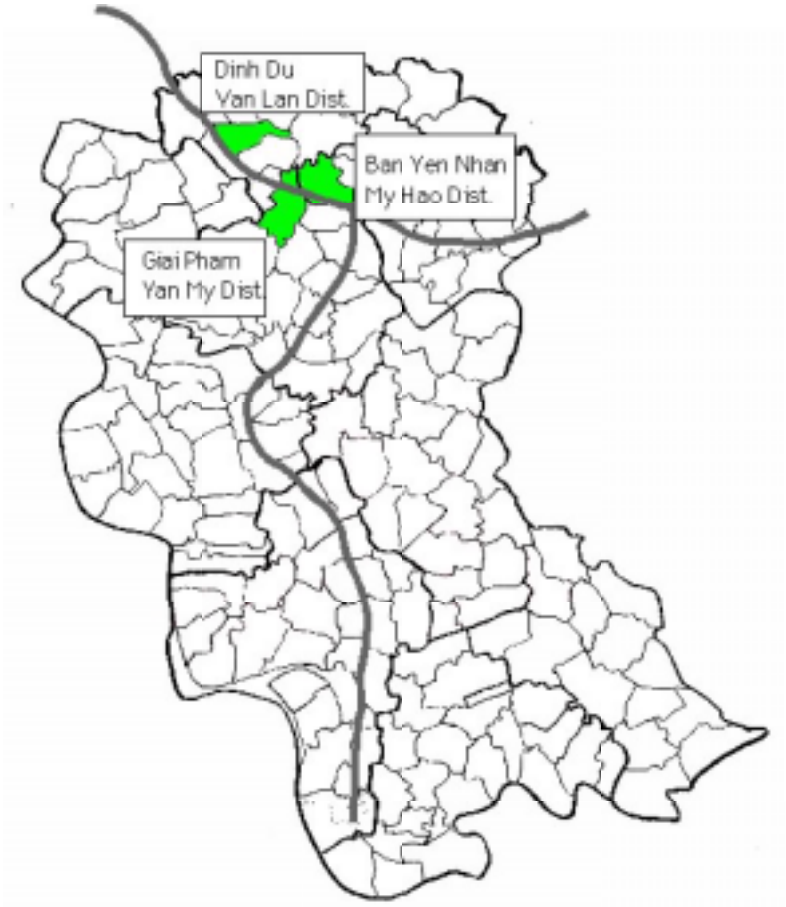
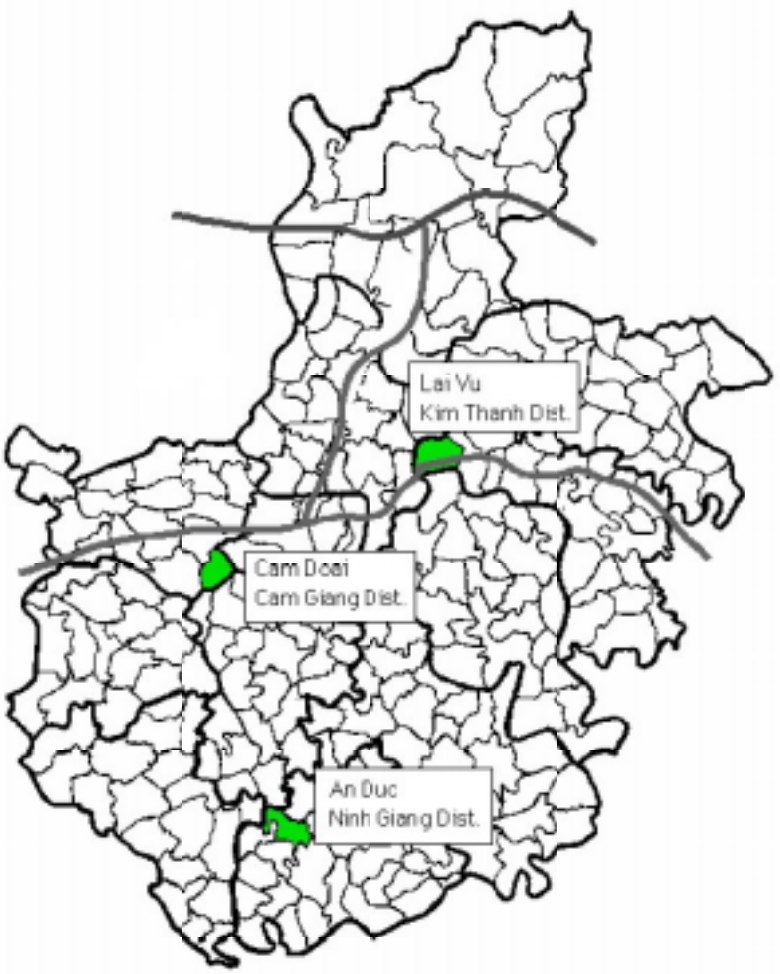


Figure 3.3.2.2: Hai Duong, Surveyed Communes



Lai Vu Commune is located along Highway No.5, 10 km east of Hai Duong city. The income per capita rapidly went up since 2000. This is because of construction business boom along Highway No.5. Many people in the commune are engaged in the building material business such as production and transportation of bricks and sand, which accounted for 30% of income sources in 2002. Other emerging economic activities are pig production and turtle and fish culture. 5 years ago, each household had only 2 or 3 pigs. Currently, 1,000 HHs have pigs, and 300 HHs have a large number of pigs. They sell pigs to butchers in Phu Thai, then pigs are traded to Hai Phong. 50 HHs are engaged in turtle raising. And 550 HHs take part in silkworm rearing. Silkworm production was first introduced in 1992 and grew fast during the period between 1998 and 2000. Products are sold to traders from Thai Binh province. Thanks to these economic activities, the share of poor households dropped from 15 % in 1998 to 7 % in 2002. The number of motorbike increased sharply from less than 100 (8% of HHs) in 1998 to 500 (42 % of HHs) in 2002. Traffic accidents are a problem on Highway No.5. Most of traffic accidents along Highway No.5 occur in Lai Vu.

An Duc Commune / Ninh Giang District

Ninh Giang District is located 30 km south from Hai Duong city and Highway No.5; it takes 45 minutes from Hai Duong to Ninh Giang. There is a daily public bus from Ninh Giang to Ha Noi and vice versa. The bus leaves Ninh Giang at 6:00 to 8:00 in the morning for Ha Noi, and leaves Ha Noi at 14:00 to 15:00 back for Ninh Giang. The bus trip takes 1 hour and costs 50,000 dongs one way. The impact of Highway No.5 upgrade is not so big as compared with other Case Study Districts along Highway No.5. However, the shift from paddy production to fisheries and vegetable production is observed in the district to some extent. From this district, many young people go to work in southern provinces such as Dak Lak and Binh Phuoc Provinces; 500 to 600 people have gone to live there since 1996. People going to work in factories along Highway No.5 are not many.
An Duc is located 10 km northeast of Ninh Giang and 20 km from Highway No.5. It takes 2 hours to Ha Noi by motorbike. Income per capita does not increase as fast as other 2 Case Study Communes in Hai Duong; from 2.1 millions dong in 1996 to 2.28 millions dongs in 2002. The major income sources are paddy and vegetable production. Planting season is from January to June for paddy, from July to October for the 2nd paddy crop, and from November to December for vegetables. A major change in the commune is that vegetable production shifts from only sweet potatoes to maize, potatoes, peppers, etc because now they produce sufficient food. They sell vegetables to increasing traders from Ha Noi, Hai Phong and Quang Ninh. From this commune, 300 people go to Ha Noi to settle and earn their living. 100 young people go to work for factories along Highway No.5. The number of motorbike increased from 30 (2% of HHs) to 300 (25% of HHs).

(2) Surveyed Communes in Hung Yen

Giai Pham Commune / Yen My District:

Giai Pham commune is situated along Highway No.5 and 18 km away from Ha Noi. Many industrial plants were built in this area, and many people got compensation for land acquisition. Some farmers use this money as initial capital to start new businesses. Those are service industries such as restaurants, shops, and guesthouses. A guesthouse provides accommodation for factory employees and vocational training students at 50,000 VND per month. Not many families are employed by factories. The average monthly income is higher than the national average amount of 300,000 – 400, 000 VND. Many farmers go to work in Ha Noi during off-farm season.

Dinh Du Commune / Van Lam District

Dinh Du Commune also lies along Highway No.5 and has similar conditions as Giai Pham Commune.

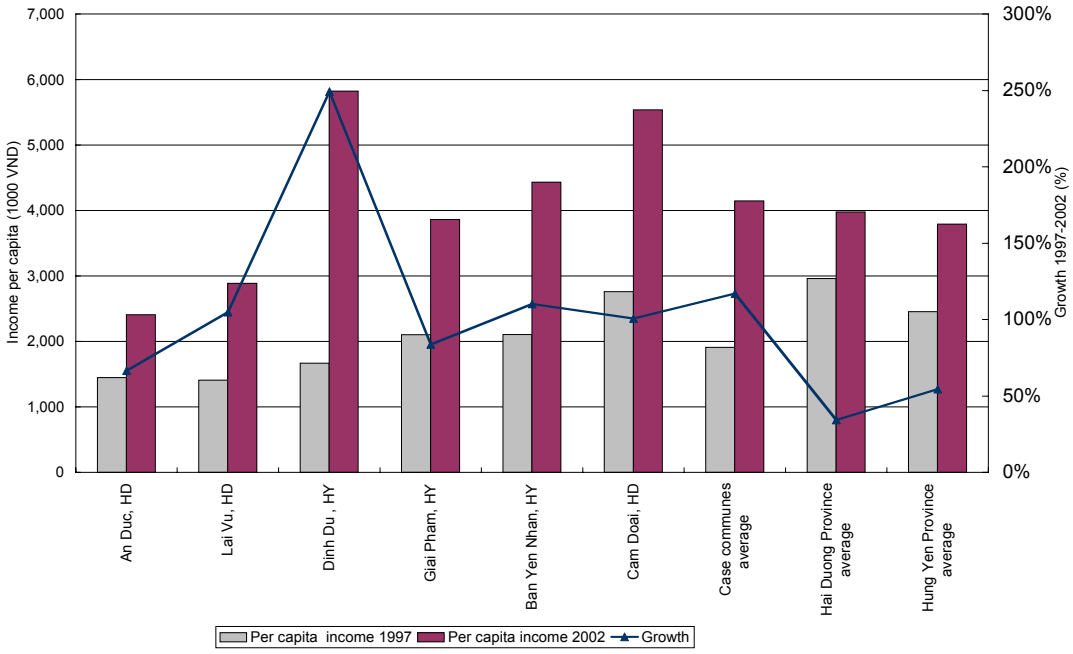
Ban Yen Nhan Commune / My Hao District

Ban Yen Nhan Commune is located along Highway No.5. Service industry is developed, and many farmers practice aquaculture.

3.3.2.2 Income Level in Surveyed Communes

The per capita income of households as obtained from the Households Survey is shown in Figure 3.3.2.3 and Table 3.3.2.1. The income per capita increased in every case study commune during the period from 1997 to 2002. The rate of the growth varies from 67% for An Duc to 249% for Dinh Du. The average growth rate is 117%.

Figure 3.3.2.3: Income per Capita of Case Study Households



Source: Table 3.3.2.1

Table 3.3.2.1: Income per Capita at the Surveyed Communes

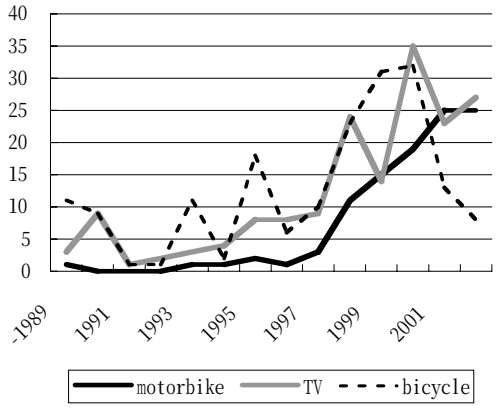
(1000 VND)

	Per capita income 1997	Per capita income 2002	Growth
An Duc, HD	1,447	2,410	67%
Lai Vu, HD	1,409	2,885	105%
Dinh Du , HY	1,668	5,824	249%
Giai Pham, HY	2,103	3,864	84%
Ban Yen Nhan, HY	2,107	4,431	110%
Cam Doai, HD	2,761	5,539	101%
Case communes average	1,910	4,145	117%
Case communes along HW5	2,011	4,545	126%
Hai Duong Province average	2,962	4,732	60%
Hung Yen Province average	2,455	3,793	55%

Sources: Study team. Statistial Year Book of Hai Duong and Hung Yen.
Note: GDP per capita of Hung Yen 2000 is substituted for those of 2002 due to availability.

One of the questions of the survey was the property ownership. The survey team asked the households if they had motorbikes, TV sets or bicycles. Surprisingly, half of them already had motorbikes, and 86% had TV sets. It was also shown that they started buying these goods after 1998 (see Figure 3.3.2.4). Purchasing power of these households went up in the late 1990s. It is assumed that the households might have made some structural transformation of their business in this period.

Figure 3.3.2.4: Years of purchasing durable goods for the surveyed households

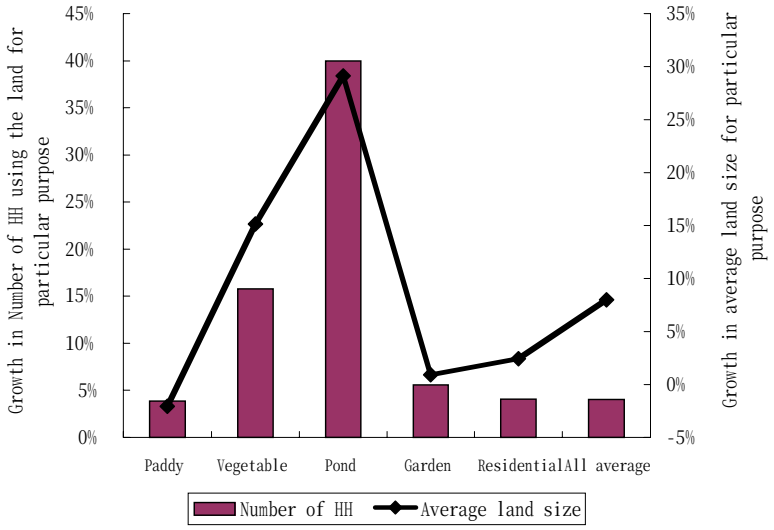


3.3.2.3 Driving Forces of Rural Development in Surveyed Communes

(1) Diversification of rural business activities

First of all, we shall look at the change in land use pattern between 1997 and 2002 (Figure 3.3.2.5). The bar chart indicates the change in the number of households that used the land for the particular purpose. The line chart shows the average land size for each purpose. It is shown from the bar chart that many households came to have fish ponds. The number of households with ponds rose by 40% in five years. The line charts also present that the average size of pond for the surveyed households increased significantly during the period. It seems that more and more households transformed their paddy fields into fish ponds, and that their ponds became bigger and bigger.

Figure 3.3.2.5: Change in land use pattern of the surveyed households: 1997-2002



Source: Rural households survey by the study team

Table 3.3.2.2 presents the number of surveyed households that started new economic activities. Out of 206 households of the survey, 97 households (47%) reported that they started some types of new economic activities. Trading seems the most popular business for the households, as 17% of the total surveyed households started this business. Fisheries came next and 13% of all households replied that they worked on this business. Some households started growing vegetables or flowers in addition to paddy rice, but the number of these households is relatively small.

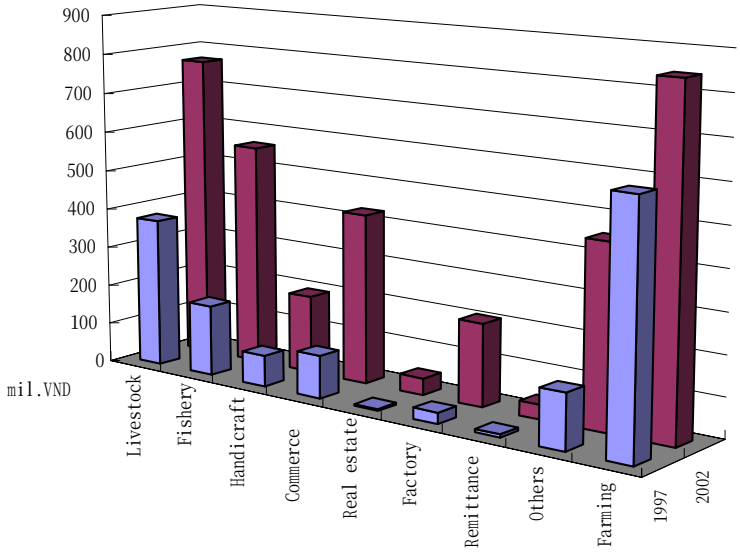
Table 3.3.2.2: Number of surveyed households that started new economic activities

	Fishery	Growing vegetables, flowers	High-quality paddy	**Commerce**	Working in other regions	Other activities	**Total**
An Duc	6	3	0	2	3	4	18
Lai Vu	3	0	0	1		5	9
Dinh Du	4	0	0	15	2	3	24
Giai Pham	2	3	0	5	2		12
Ban Yen Nhan	5	5	0	9	2		21
Cam Doai	7	0	0	4	2		13
Total	27	11	0	36	11	12	97
Share in HH that started new activity	**28%**	11%	0%	**37%**	11%	12%	**100%**
Share in total surveyed HH	**13%**	5%	0%	**17%**	5%	6%	**47%**

Note: Data of 206 households of the survey
Source: the study team

Figure 3.3.2.6 presents the changes in structure of income of averaged households in the survey between 1997 and 2002. The average household income is divided into various economic activities, such as farming, livestock production, fisheries, handicraft, trading, real estate revenue, factory employment, remittance and others. It seems that farming remained the most important business for the households and it still had the biggest share in the household income in 2002. However, incomes from livestock production, fisheries and trading have increased significantly in the five years. The source of income for the surveyed households became much more diversified.

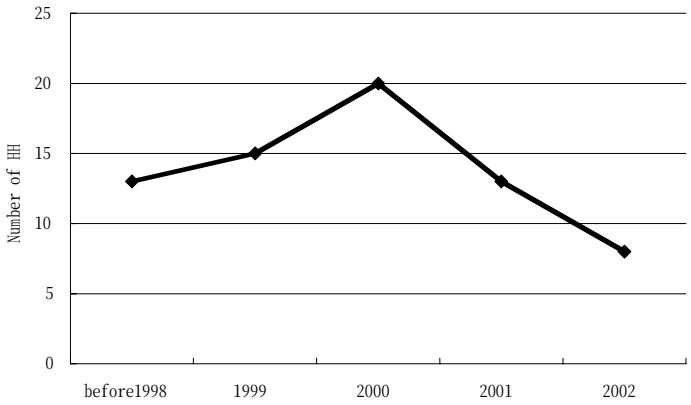
Figure 3.3.2.6: Structure of average income of the surveyed households: 1997-2002



Source: Rural households survey by the study team

Figure 3.3.2.7 shows the years of starting new businesses for the surveyed households. Many of them started new business before the completion of the Highway No.5 and Hai Phong Port projects. Out of 70 households that started some kinds of new business, 48 households (68%) started the business by 2000. The number of households that started new business declined after 2001. The reason for this decline is not clear, due to the small size of the surveyed households. However, this might be explained by the limited business opportunities or the lack of capital, technology or entrepreneurship and the like.

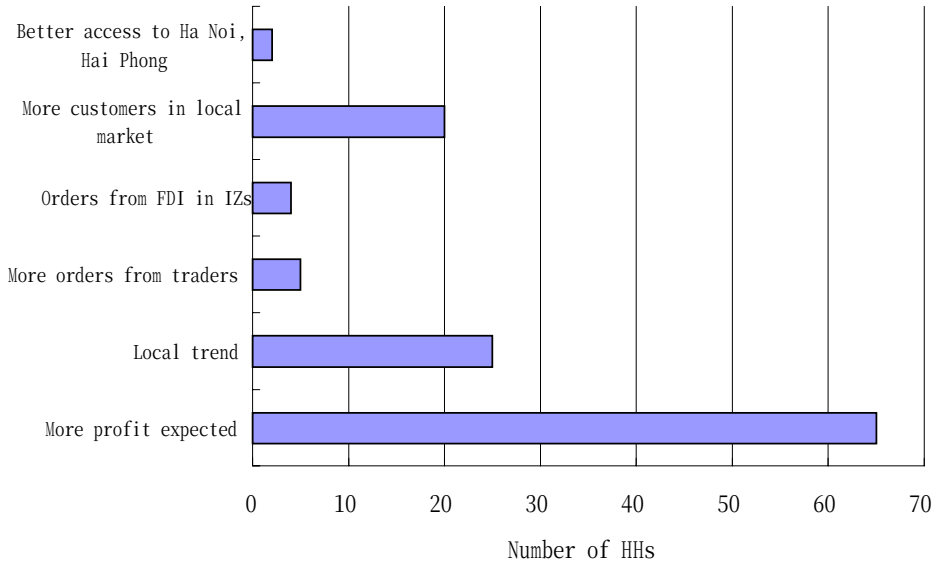
Figure 3.3.2.7: Year of starting new business for the surveyed households



Note: data of 70 households, which started any new business
Source: Rural households survey by the study team

Why these households decided to start the new business? Figure 3.3.2.8 presents the main reasons for this. Many of the households simply pointed out that they started the business because they could expect more profit. Others mentioned that they followed the local trend or that they found more customers in the local market. It is quite surprising that a relatively small number of households started new business in expecting more demand in Ha Noi markets or from FDI companies. The households do not seem to be dependent on the demand from urban markets or foreign enterprises. The driving force of rural development could be rural economy itself.

Figure 3.3.2.8: Reasons for starting new business for the surveyed households



Note: data of 78 households, which started any new business, more than one answers
Source: Rural households survey by the study team

Diversification of income sources for local households shall be examined from the viewpoint of local traders. The results of local traders' survey by the study team are presented in the following tables. Table 3.3.3.2 shows the local traders' view about the recent changes in variety, origin and volume of agricultural products. Out of 50 local traders interviewed, over 50% mentioned that they had "much more" or "more" variety of products as compared with five years ago. Only 38% of them did not see any change in the variety. The origin of products has also been diversified in the last five years.

Seventy percent of the traders considered that the product origins were diversified to some extent. For many of traders, however, the volume of products remained unchanged during the period.

Table 3.3.2.3: Change in variety, origin and volume of products for local traders

(1) Varieties of agri-products in the last 5 years

	No. traders	
Much more variety of products	12	24%
More variety of products	16	32%
No change	19	38%
No answer	3	6%
Total	50	100%

(2) Products origins in the last 5 years

	No. traders	
Significantly diversified	14	28%
More or less diversified	21	42%
No change	11	22%
No answer	4	8%
Total	50	100%

(3) Volume of products sold in the last 5 years

	No. traders	
Increased	14	26%
Not increased	40	74%
Total	54	100%

Source: Local traders survey by the study team

Table 3.3.2.4 shows the traders view on the changes in the type of products in the last 5 years. Out of 39 traders responding to the interview, 56% stated that they handled more vegetables than before. It seems, moreover, the volumes of meat and fish products also increased to a less extent in this period. It was shown that 40% of the traders purchased products directly from farmers, and 25% of them produced the products by themselves.

Table 3.3.2.4: Types of products increased for local traders

(1) Increased products in the last 5 years

	No. traders	
Vegetable	22	56%
Meat	9	23%
Fish	2	5%
Others	6	15%
Total	39	100%

(2) Procurement of products

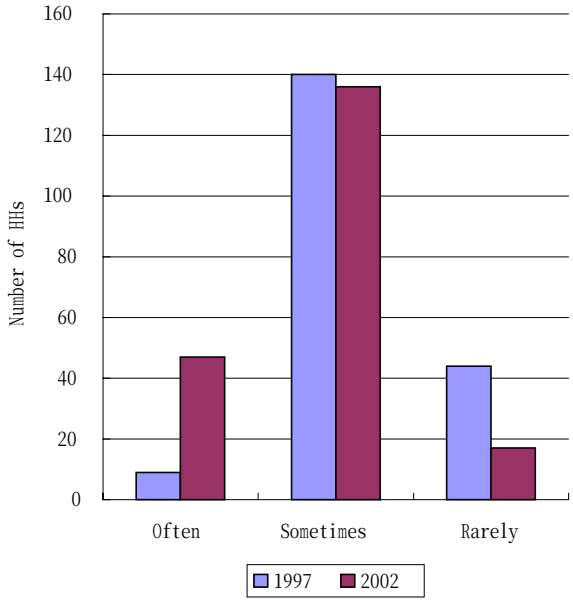
	No. traders	
Directly from farmers	16	40%
Self-producing	10	25%
Buy at local markets	7	18%
From traders	3	8%
Farmers come to sell	2	5%
Other traders come to sell	2	5%
Total	40	100%

Source: Local traders survey by the study team

(2) Better access to social service

The access to social services for rural households is examined. Good access to education or health care services should also have a significant impact on poverty reduction. Figure 3.2.2.9 shows the changes in frequency to visit big cities for the surveyed households between 1997 and 2002. The number of households that "often visited" rose, and those "rarely visited" decreased in the five years. However, many of them visit the cities only "sometimes".

Figure 3.3.2.9: Change in frequency to visit cities for the surveyed households



Note: data of 200 households of the survey
Source: Rural households survey by the study team

Table 3.3.2.5 shows the main destination of the visit to cities for the surveyed households. Ha Noi and Hai Duong are the two major cities for them to visit. Out of 200 households of the survey, 64% of respondents answered that their main destinations of the visit are the two cities. Relatively few households seem to visit Hai Phong.

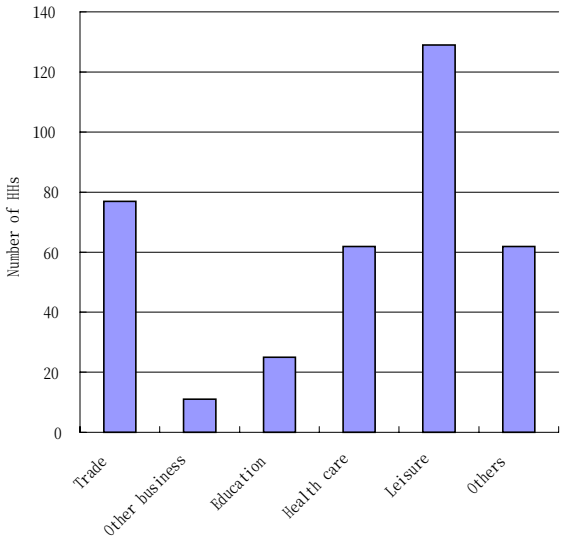
Table 3.3.2.5: Main destination of the visit to cities for surveyed households

	Number of HH	%
Ha Noi	131	64
Hai Phong	68	33
Hai Duong	131	64
Hung Yen	47	23
Others	8	4

Note: data of 200 households of the survey
Source: Rural households survey by the study team

Figure 3.3.2.10 shows the main purpose of the surveyed households to visit big cities such as Ha Noi and Hai Phong. "Leisure" is the most common reason for them, which is followed by "trade" and "health care". Very few households go to the cities to get educational services there. This might be due to the fact that the two provinces have already established relatively developed educational facilities from primary to tertiary levels.

Figure 3.3.2.10: Main purpose to visit cities for the surveyed households



Note: data of 200 households of the survey, more than one answers
Source: Rural households survey by the study team

Table 3.3.2.6 shows the main means of transport for the surveyed households to visit these cities in 1997 and 2002. The number of households that used "motorbike" increased significantly between the two years. In 2002, 35% of the households went to cities by motorbike. This reflects the fact that many households purchased motorbike in the late 1990s as shown in Figure 3.3.2.4. The number of households using public bus decreased from 76% to 53% in this period. According to the local officers, the provincial government recommended the local people to use public bus when they traveled to Ha Noi or Hai Phong on Highway No.5, for the fear of the increasing number of traffic accidents caused by motorbikes.

Table 3.3.2.6: Means of transport to visit cities for surveyed households

	1997		2002	
	Number of HH	%	Number of HH	%
Bicycle	10	5	4	2
Motorbike	14	7	78	38
Public transport means	157	76	110	53
Others	7	3		
Total	188	91	192	93

Note: data of 200 households of the survey
Source: Rural households survey by the study team

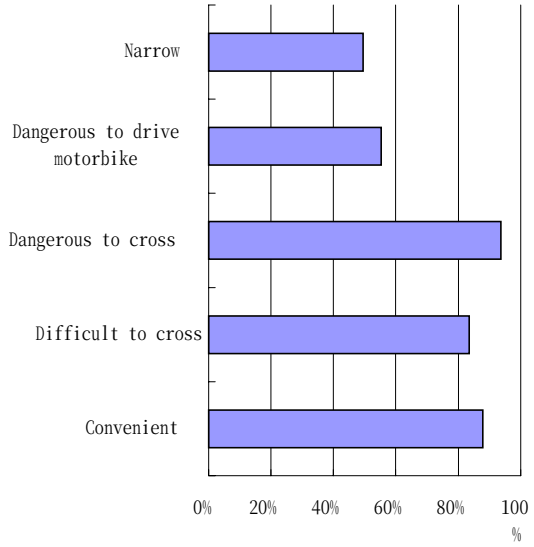
Table 3.3.2.7: Views of surveyed households about unsafe traffic on Highway No.5

	Number of HH	%
Too many vehicles	163	79
Automobile drivers driving carelessly	142	69
Motorbike drivers driving carelessly	125	61
Passengers are not careful	23	11

Note: data of 200 households of the survey, more than one answers
Source: Rural households survey by the study team

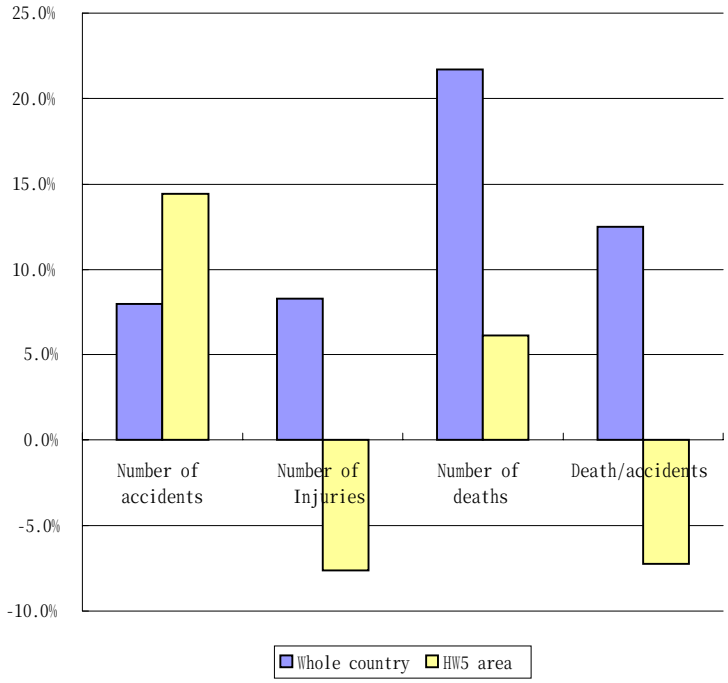
Table 3.3.2.7 shows the views of surveyed households about the unsafe traffic on Highway No.5. Out of 200 households of the survey, 79% of them said that the highway was unsafe because of too many vehicles on the road. They also mentioned that drivers of automobiles and motorbikes did not drive carefully on the highway. Figure 3.3.2.11 presents the perception of local households about the Highway from another viewpoint. Most respondents consider Highway No.5 as convenient. However, they also pointed out that the highway was "dangerous" or "difficult" to cross.

Figure 3.3.2.11: Views on the upgrading of Highway No.5 for the surveyed households



Note: data of 206 households of the survey, more than one answer
Source: Rural households survey by the study team

Figure 3.3.2.12: Annual growth rate of traffic accidents: 1999-2002



Source: Transport department of the local provincial peoples committees

However, due to a series of traffic safety campaigns by the public authorities, this problem seems to be under control now. Figure 3.3.2.12 shows the annual growth rate of traffic accidents from 1999 to 2002. The data of the whole country and that of Highway No.5 area are compared. Although Highway No. 5 had a higher growth rate of accidents, the highway came to have less injuries and deaths in comparison with the national average.

Example of traffic safety campaign by the public authority

A picture displayed in many parts of cities and towns along Highway No.5, saying "Strict Execution of the Road Traffic Law *Prevent Motorbike Accidents*"

Box 1: Case of household in Lai Vu Commune: from paddy to turtle raising.

There are 6 members in Mr. B's family, including 4 children. His first child is already married and lives independently. He has 11 acres of land, 2 acres of fish pond, 1 acre of turtle pond, 5.5 acres of paddy and vegetables. He started raising turtles in 1998 after getting information from extension services program on TV. He invested his own capital to buy 5 pairs of parent turtles at 5.2 million dongs. The loan was not available because the one-year payback period was too short for turtle production, which takes 30 months to harvest. His income increased from 2.6 million dongs 5 years ago to 50 millions dong. Currently, 30 to 40 % of his income is from turtle production. He has 20 to 25 pairs of parent turtles that could produce 1,000 babies a year. He sold part of baby turtles to people in communes and grew the rest of babies to sell to traders from Hai Duong. Thanks to turtle production, he can give good education to his children. His 2nd child goes to college in Ha Noi, and his 4th child is preparing for college. He often goes to Hai Duong for private purpose by motorbike, which was purchased few years ago at 17 million dongs. He seldom goes to Hai Phong and Ha Noi. The best thing of the upgrade of Highway No.5 for him is the better road conditions for trading; traders can easily come to his house.

Box 2: Case of household in An Duc Commune: from paddy to pig raising.

Mr. C has 8 family members including 4 children. His household is classified as fairly rich according to the commune. He has 70 acres of land, 20 acres of paddy field, 40 acres of fishpond, and 10 acres of gardens. He diversified his income sources over these 5 years. His income increased from 27 million dongs 5 years ago to 80 million dongs in 2002. The share of income sources was 15% from fisheries, 10% from pig raising, and 80% from vegetables and rice in 5 years ago, and that of 2002 was 40%, 30% and 30% respectively. It is noted that he often goes to Phu Thai town in Hai Duong Province to exchange information with traders for business, and this is one of the factors to expand the business. He fully utilized upgraded Highway No.5.

Box 3: Case of Households of Cam Doai Commune: from paddy to fishery

Mr. A, a farmer, has 5 family members including 3 children. He has 9 acres[1] (0.32 ha) of paddy field and 0.32 ha of fishpond. The household is classified as fairly rich in the commune. He was a rice-growing farmer ten years ago, while he began fish rearing after getting an idea from TV in 1994. Fish culture becomes a major source of income , and his income increased dramatically as shown in the table below. He raised fish but did not get good harvest 5 years ago. After 1998, he succeeded dramatically. As one of the reasons of the success, he mentioned the betterment of the access to the town. Highway No.5 makes it easier for traders to come to his fishpond to buy fish. He calls traders in Ha Noi to ask prices and deals with the best-offered traders out of more than 10 buyers. He often goes to Hai Duong city by motorbike which he bought 2 years ago at 15 million dongs. For production, he borrows 10 to 15 million dongs per season from cooperatives through the commune. He has to pay back in a year with 1 % interest rate.

Table B1: Change of income and its sources

	5 years ago		2002	
	Amount (mil VD)	Share (%)	Amount (mil VD)	Share (%)
Fisheries	NA		20.2	70%
Farming:rice	NA		8.5	30%
Total	5		28.7	
Converted to 1997price by CPI	5		25.3	

Sources: The study team

Table B2: Revenue and expenditure structure of farming and fishery in a household

		Items	Estimates	Breakdown
Fish culture	Income		34 mill. VD/year	Produce fishes: 1.7 ton/times x 2 times/years. Sell at 10,000 VD/kg
	Cost	Fingering	3.2 mill. VD/year	2 ton/times Price: 8,000 VD/kg
		Feed	5.8 mill.VD/year	Buy maize: 200kg/month Maize price: 2,400 VD/kg Rice & grass: self producing
		Harvest	0.8 mill.VD/year	Labor: 10 people/night x 2 nights x 2 times/year Price: 20,000 VD/night
		Total	9.8 mill. VD/year	
	Profit		24.2 mill.VD/year	
Farming	Income	Paddy	0 mill. VD	Self consuming and feeding fishes. Production: Winter paddy: Dec-May: 200kg/sao x 9 sao=1.8ton Spring paddy: May-Aug: 160kg/sa0 x 9 sao=1.44ton Total production: 3.24 ton
		Vegetable	9 mill. VD/year	Produce and sell maize, ginger, and pumpkin. 2 mill.VD/sao x 4.5 sao
	Cost	Seed	160,000 VD/year	High quality rice from coop: 1kg/season x 20,000 VD/kg Ordinary rice from market: 15 kg/season x 4,000 VD/kg
		Fertilizer	210,000 VD/year	Buy from coop: 70 kg/season x 3,000 VD/kg
		Pesticide	100,000 VD/year	
		Labor	0 VD/year	Themselves.
		Total	0.47 mill.VD/year	
	Profit		8.5 mill.VD/year	

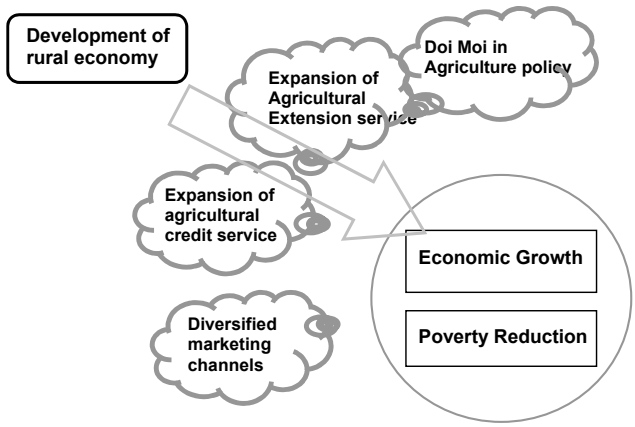
Sources: The study team.

[1] 1acre (*'sao'* in Vietnamese) = 360 m^2 = 0.036 ha.

3.3.3 Concurrent Interventions and Surrounding Environment

The improvement of transport infrastructure alone should not have caused economic growth and poverty reduction. It should be emphasized that the concurrent interventions or some external factors are also of primary importance. These concurrent interventions should include the Doi Moi renovation in agriculture policy, expansion of agriculture extension service, expansion of agricultural credit service, as well as diversification of marketing channels.

Figure 3.3.3.1: Concept of the concurrent interventions for rural development



3.3.3.1 Doi Moi in Agriculture Policy

A series of Doi Moi reforms in the agriculture policy have created favorable conditions for the diversification of local agricultural production, and the government introduced various programs to support this diversification, such as the followings.

- Recognition and promotion of private farming (1998)
- New Land Law: recognition of land use right (1993)
- New agricultural development strategy (1993)
  - Diversification of agricultural production
  - Promotion of handicraft or rural industry
  - Expansion of export market
  - Introduction of new technology and capital
- New guideline on restructure of farm economy (2000)
  - Promotion of transforming land for rice to other crops, vegetables

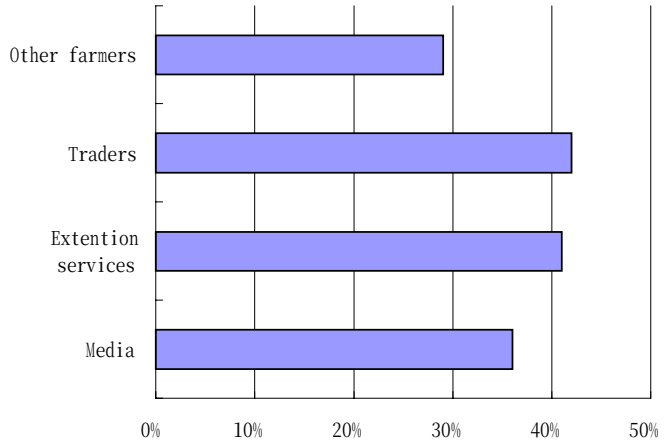
For instance, the Resolution 10 of 1998 on "Renovation of management of agricultural economy" created the condition under which each rural household become an independent production unit, and farm households gained security of tenure to land and the ownership of the means of production. The private farmers have been given the enhanced power and responsibility for the land entrusted to their management. This is clearly defined in the Land Law in 1993 that granted "five rights" to those legally possessing land for long-term use: the rights of transfer, exchange, lease, inheritance, and mortgage. The Resolution 10 also encouraged the restructure of farm management structure under which land, labor, and other production means are to be reallocated. Those who have competent farm management are given the potential to expand farm size.

The five years plan (1996-2000) also encouraged the restructure of rural economy under which the government tries to diversify the rural economy from depending on agriculture to developing industry and services. Rural industry includes agro-processing, handicraft and construction material processing. Service industry includes transportation, credit, and input supply services. Under the plan, diversification of agriculture is also encouraged from rice centered to diversified farm structure by developing livestock production, industrial crops, and horticultural crops.

3.3.3.2 Agricultural Extension Service

The expansion of agricultural extension service also benefited farmers. Each province has Center for Agricultural Service and Expansion, and this center provides valuable technical information to farmers directly or through the media. Our rural household survey told us that many of them received the information to start new business directly from the extension service or through the media. Among the 73 households that started some new business, 41% of the mentioned that they received the information about the business from the extension service center, and 36% got it from the media. The role of the provincial agricultural extension service should be significant in promoting the diversification of rural economy. The main activities of the extension center of Hung Yen and Hai Duong provinces shall be described as follows:

Figure 3.3.3.2: Source of information for starting new business for the surveyed households



Note: data of 73 households, which started new business: more than one answer
Source: Rural households survey by the study team

Hung Yen

Hung Yen province, for instance, has one agricultural extension center, called Center for Agricultural Service and Extension, which was established in 1997 after being separated from Hai Duong province. This center has 32 staff members, including six agricultural engineers and 21 technicians. As the province does not have any agricultural extension network at the commune level, this Center provides service to local farmers in associating with agricultural extension workers at the district level. Each district has four to five extension workers. The extension services shall be provided with following means.

- Training courses (long-term, short-term)
- Demonstration of new technology with model farms
- Regular visit to local farmers
- Media through TV and radio

The Center implements not only the extension program, but also several promotion projects commissioned by the central and local governments. These projects focus on the following issues.

1) Cultivation of high valued rice
2) Transfer to fruit crops, such as lychee
3) Promotion of livestock production, high quality pigs in particular
4) Promotion of aquaculture

The local farmers lack technical knowledge, credit and market information. Hence, even though the demand for high valued agricultural products is rapidl expanding in Ha Noi, only a small number of can fully utilize such new business opportunities. The agricultural extension service is, therefore, of primary importance. The annual budget of the Center in 2002 is the following. According to the director of the

Center, the amount of budget is far from sufficient and much smaller than those in the neighboring provinces.

Technical transfer service	VND 50 million
Projects under the Central Gov.	VND 500 million
Projects under the Prov. Gov.	VND 500 million
Recurrent expense	VND 400 million
Total	VND 1,450 million

Hai Duong

Hai Duong province also has the same extension center with 18 technical staff members, including 2 for aquaculture, 5 for livestock, 8 for cultivation, and 3 for economics. In cooperation with the extension workers at district levels, the center provides the following services to local farmers.

- Training courses
- Distribution of technical leaflet
- Demonstration of new technology with model farms
- Media through TV and radio
- Provision of market information

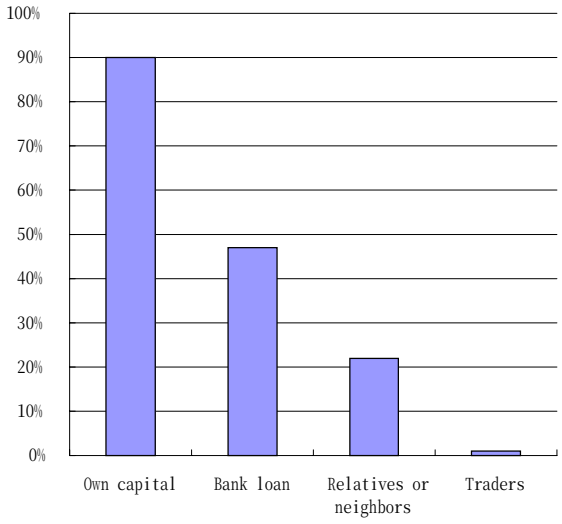
In 2002, the center implemented 1,621 training courses, and over 100,000 farmers participated in these courses. It is estimated that one fourth of local households joined these courses. The center also distributed 283,000 sheets of leaflet to local farmers. The annual budget of the center is around 1,500 billion VND, of which 55% come from the central government to implement promoted projects.

Hai Duong province does not have extension workers at commune level, so the center tries to encourage local farmers to make a voluntary organization, called "Agricultural Promotion Club". Currently the province has eighty such clubs, some of which have close relationship with other organizations such as the Women's Union or Farmer's Union.

3.3.3.3 Agricultural Credit Service

Availability of agricultural credit service was also an important condition to promote structural change in the rural society. Our household survey tells us that bank loans are the largest source of initial capital to start new business other than the own capital of the households themselves (see Figure 3.3.3.3). Out of 77 households that started some new business, 47% of the surveyed households used bank loans as the initial capital.

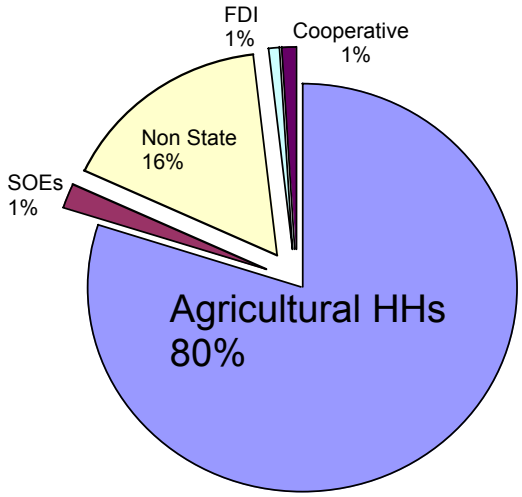
Figure 3.3.3.3: Source of initial capital to start new business for the surveyed households



Note: data of 77 households, which started new business: more than one answer
Source: Rural households survey by the study team

Viet Nam Bank for Agriculture and Rural Development (VBARD) is major rural finance institution. In Hai Duong province, the bank has 11 District branches and 5 Commune branches. The lending increases every year. The outstanding grew 4 times from 260 billion VND in 1997 to 1,000 billion VND in 2003. Figure 3.3.3.4 presents the composition of lending balance in 2003. Eighty percent of loans go to farming households, and private enterprises receive 16% of the total balance. According to the director of the branch, the number of private enterprises increased rapidly in the last few years.

Figure 3.3.3.4: Hai Duong, Bank for Agriculture, Portfolio composition in 2003



Source: Bank for Agriculture, Hai Duong Branch

Other than this bank, People's Credit Fund, Rural Joint Stock Bank and Industrial Commercial Bank operate in Hai Duong province. However, the share of the Bank for Agriculture reaches 80% of all. Around 42% of the total households in the province receive loans from this bank.

Main economic activities of the clients of this bank are shown in Table 3.3.3.1. Seventy two percent of the clients are engaged in agriculture. Many clients use this loan for fruit production especially lychee, transformation from paddy to fish rearing, expansion of livestock production and purchasing cattle. Moreover, according to the director of the bank, the number of clients in the service sector is expanding rapidly, particularly the number of those working on transport business.

Table 3.3.3.1: Hai Duong, Bank for Agriculture, Main Business of the Clients in 2003

Agriculture	72%
Food processing	10%
Mechanics	10%
Service	8%
Total	100%

Source: Bank for Agriculture, Hai Duong Branch

Table 3.3.3.2: Hai Duong, Bank for Agriculture, Loan Conditions in 2003

	Duration	Monthly interest rate for the Bank	Government limit of monthly Interest rate
Long-term loan	1-5 years	1.05%	1.15%
Short-term loan	less than 1 year	0.95%	1.00%

Source: Bank for Agriculture, Hai Duong Branch

Table 3.3.3.2 presents the loan conditions for clients of this bank. The director of he bank pointed out that they offered favorable conditions to clients with lower monthly interest rates than the other banks. 5

The impact of improvement of Highway No.5 can be shown in Figure 3.3.3.5. The Districts along the Highways No.5 and No.18 have a larger amount of loans from this Bank than the others. This map shows the recent per capita lending balance by district in Hai Duong. It seems that the districts near Highway No.5 and Highway No.18 received larger bank loans per capita. This suggests that economic activities in these districts are growing rapidly. According to the director of the bank, the recent growth in Chi Linh district is particularly remarkable, where Highway No.18 is located.

Figure: 3.3.3.5: Hai Duong Bank for Agriculture, per capita lending balance by district in March 2003

Source: Bank for Agriculture, Hai Duong Branch

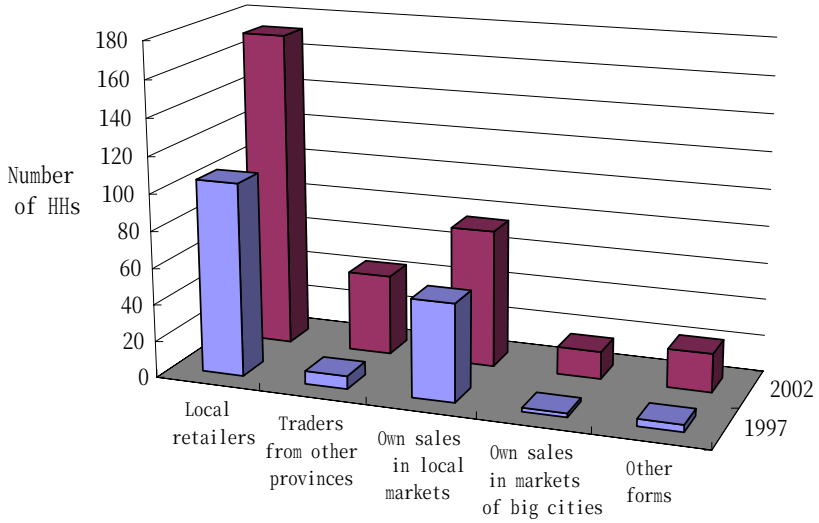
3.3.3.4 Diversified Marketing Channels

The last type of intervention is the diversification of marketing channels. It is expected that the improvement of transport infrastructure should result in the increase in the number of traders or retailers coming to rural villages to purchase agricultural products. The rural households might have more and more opportunities to sell their products now. Figure 3.3.3.7 shows the changes in marketing channels for the surveyed households between 1997 and 2002. It seems that local retailers became the most significant marketing channels for the households. The number of households that sold their products to local retailers increased from 105 to 172 in the five years. It is also interesting to see that the households had got more opportunities to sell to traders from other provinces in the period. In 1997, only 7 households sold their products to traders of other provinces, but this number increased to 44 in five years. The improvement of the Highway No.5 should be one of the important factors to encourage more traders to come to the communes along the highway.

Figure 3.3.3.7
shows the views of the surveyed households about the reasons for the recent better sales. This figure also suggests that the increase of local retailers significantly benefited the surveyed households. Out of the 188 households responded to the survey, 160 households mentioned that the increase in the number of local retailers was the reason for the better sale. The second reason is the increasing number of local consumers, which was pointed out by 74 households (40%). For 33 households, the increase in the

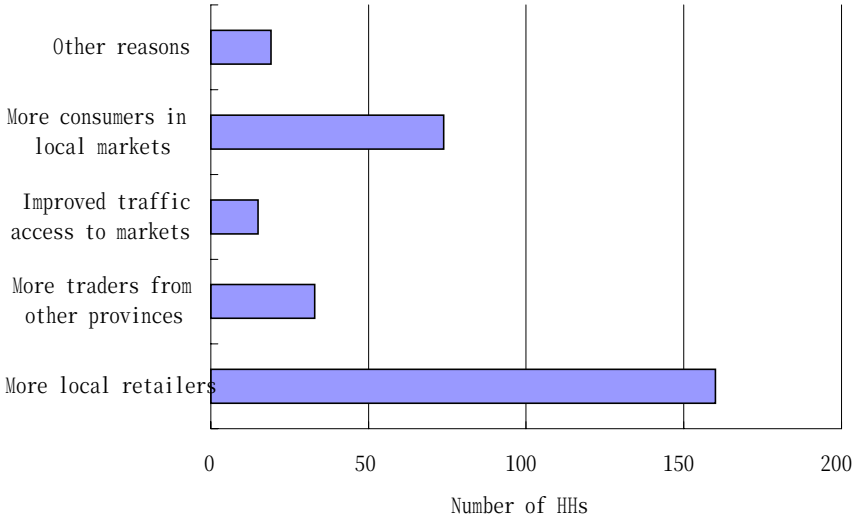
number of traders from other provinces was also a significant reason for the better sales. From these data, however, the driving force of rural development in this area seems to be the local economy itself.

Figure: 3.3.3.6: Changes in marketing channels for the surveyed households



Note: data of 195 households replied to the survey: more than one answer
Source: Rural households survey by the study team

Figure: 3.3.3.7: Reasons of increased sales for the surveyed households



Note: data of 188 households replied to the survey: more than one answer
Source: Rural households survey by the study team

The diversification of the marketing channels and the growth of local economy shall also be supported by the result of interview survey of 54 local traders, who came to Hung Yen and Hai Duong provinces. Table 3.3.3.3 presents the main findings of this interview survey.

Table 3.3.3.3: Views of local traders about the change in the markets

(1) Save time to access the markets

	No. of traders	
Very significant	13	24%
Significant	27	50%
No impact	3	6%
Negative impact	2	4%
No answer	9	17%
Total	54	100%

(2) Access to more markets opportunities

	No. of traders	
Very significant	8	15%
Significant	22	41%
No impact	4	7%
Negative impact	1	2%
No answer	19	35%
Total	54	100%

(3) Increase in the number of buyers

	No. of traders	
Very significant	9	17%
Significant	28	52%
No impact	1	2%
Negative impact	1	2%
No answer	15	28%
Total	54	100%

(4) Increase in the number of suppliers

	No. of traders	
Very significant	3	6%
Significant	13	24%
No impact	8	15%
No answer	30	56%
Total	54	100%

(5) Increase in the variety of suppliers

	No. of traders	
Very significant	1	2%
Significant	11	20%
No impact	10	19%
No answer	32	59%
Total	54	100%

(6) Expansion of the business

	No. of traders	
Very significant	1	2%
Significant	9	17%
No impact	13	24%
No answer	31	57%
Total	54	100%

(7) Increase in the turnover

	No. of traders	
Very significant	4	7%
Significant	24	44%
No impact	2	4%
Negative impact	2	4%
No answer	22	41%
Total	54	100%

(8) Reason for the increase in the turnover*

	No. of traders	
More purchasing power of local consumers	42	56%
Higher valued products	17	23%
Higher prices of products	11	15%
Other reasons	3	4%
No answer	2	3%
Total	75	100%

* : more than one answers

Source: Local traders survey by the study team

The improvement of the transport infrastructure should have made large impacts on their access to the markets. Three quarters of the respondents mentioned that the travel time to the markets was reduced either significantly or very significantly (1). Moreover, the traders seem to have more and more opportunities in the markets. Thirty traders out of 54 saw the expansion of market opportunities to a significant extent (2). The traders faced a larger number of buyers in the market, as 69% of them pointed out that the increase was significant or very significant (3). Consequently, over half of the traders were able to increase their turnover (7). Concerning the reason for the increase in the turnover, 56% of the traders pointed out "more purchasing power of local consumers" (8). This also suggests that the driving force of the recent development in this area is the growth of the local economy itself. The increase in the number of retailers or traders should have contributed to this by providing more market channels.

APPENDIX

for

Impact on Transport Economy

APPENDIX 1 Vehicle Operating Cost

1. Types of Benefits Resulting from Savings in Vehicle Operating Cost

There are 10 types of vehicle operating cost (VOC) benefits (refer to Table A.1.1). VOC for project benefit calculation can be divided into two main groups, fixed and variable. Running cost is complied into the unit cost per travel distance (1 km), which fixed cost into the cost per running hour. The fixed cost does not vary according to the travel distance and speed, in short, this can be called a kind of "Property Possession Fee."

Table A1.1: Types of Benefits of VOC Saving

Variable costs saving (Running Costs)	(1) Fuel cost saving benefit
	(2) Lubricant oil cost saving benefit
	(3) Tires cost saving benefit
	(4) Maintenance (spare parts) cost saving benefit
	(5) Maintenance (labor) cost saving benefit
	(6) Depreciation (distance related) cost saving benefit
Fixed costs saving	(7) Depreciation (time related) cost saving benefit
	(8) Interest cost saving benefit
	(9) Crew cost saving benefit
	(10) Overhead cost saving benefit

2. Selection of Typical Vehicle

The grounds for VOC computation can be divided into two categories: factors which are unique to the locality (in this case, Viet Nam), and factors which are universal. Factors of the former group include: available vehicle types, fuel, tires, parts and their respective prices, as well as personnel expenses. Factors of the latter group include: car longevity, amount of kilometers driven, car mileage, and number of wheels per vehicle. The most important factor of the first group is vehicle type and cost, which dictate running expense to a large degree.

There are different kinds of cars: imported cars, cars of local production and assembly, cars produced by different manufacturers, cars of various models, new cars, etc. The prices, of course, are also varied, as does vehicle operating cost.

The fourteen (14) types of vehicles used as the basic data for the study area are in accordance with vehicle, registration classification and classification ration and with Registration Tax Department classification.

Seven (7) types of vehicles were selected for the basic data for base speed, which is considered to represent VOC.

A hearing was conducted with Ha Noi dealers, but due to the high number of vehicle types, widely varying prices, and differing importers, appropriate data was unobtainable, so vehicle types and prices as registered by the Ha Noi Vehicle Taxation Department were adopted. This registration class is revised every two years and can be considered as representing the correct financial cost as it is the foundation of automobile taxation

Four (4) types of vehicles used for VOC estimation of different speeds are based upon actual traffic composition of the field study of the area. Particularly motorcycles are common in the area. Accordingly, VOC calculation was undertaken for motorcycle separately.

Table A1.2: Selection of Typical Vehicle for VOC

Basic Data	Base Speed	Traffic Estimation	VOC Estimation
(1) Passenger car	Passenger car		
(2) Van	Van	Passenger car	Passenger car
(3) Under 12 seats			
(4) 12 - 36 seats	Medium Bus	Bus	Bus
(5) Over 36 seats	Large Bus		
(6) Under 1 ton			
(7) 1 - 3 ton	Medium Truck		
(8) 3 - 5 ton		Truck	Truck
(9) 5 - 7 ton			
(10) 7 - 10 ton	Heavy Truck		
(11) Over 10 ton			
(12) Honda Dream			
(13) 70 cc	Motorcycle	Motorcycle	Motorcycle
(4) Under 50 cc			

3. Division of Market Price and Economic Price of Vehicle Operating Cost

Vehicle operating costs are calculated in two parts: economic vehicle operating cost and financial vehicle operating cost. Economic VOC is artificially derived by eliminating all the transfer items from the financial VOC expressed at the market price. All the taxes are deducted from the market price of materials concerned, and subsidies are added to the market price.

This economic VOC reflects real cost of vehicle travel and is equivalent to marginal productivity of each market.

4. Unit VOC by Base Speed

Tables A.1.4 to A.1.6 show unit of VOC of 7 vehicle types according to base speed.

Table A1.3: Base Speed for Unit VOC Calculation

Vehicle Classification	Base Speed
1. Passenger car	70 km/hr
2. Van	60 km/hr
3. Small Bus	50 km/hr
4. Large Bus	45 km/hr
5. Medium Truck	50 km/hr
6. Heavy Truck	40 km/hr
7. Motorcycle	40 km/hr

For each vehicle type, annual mileage and life span have been estimated for a "base speed," and for a flat, tangent and paved road in good condition. The "base speed" must be interpreted as the average year-round speed. When this speed decreases, the annual mileage will decrease as will the life span mileage; speed increase will have similar increasing effects. However, linear proportionality does not exist.

1) Table A.1.5 shows unit VOC per vehicle per km calculated based upon the data of Table A.1.4.

2) The running unit cost is calculated as running cost per km per vehicle, and as fixed cost per

vehicle per hour.

3) For the data of fixed cost, the total running cost was calculated at base speed.

In this study, many different sources have been used in order to arrive at a reliable and moderate base value. Table A.1.5 is based upon the following data; also hearings with vehicle dealers, transport companies, and from users.

1) Transport Cost, National Transport Sector Review of Viet Nam (UNDP project, prepared by BCEOM)
2) Feasibility Report for National Road Route No. 18 and No. 1 prepared by consultant.
3) Research Papers prepared specially by the World Bank.
4) Data from several organizations within the Vietnamese government.

Table A1.4: Input Data for Unit Vehicle Operating Cost Calculation by Base Speed

Unit : Dong

Items	Passenger Car	Van	Med-Bus	Large Bus	Medium Truck	Hvy. Truck	Motor Cycle
Vehicle Price (excl. Tires) Fin-Dong	214, 000, 000. 00	236, 300, 000. 00	262, 000, 000. 00	945, 000, 000. 00	277, 200, 000. 00	558, 000, 000. 00	19, 760, 000. 00
Vehicle Price (excl. Tires) Econ-Dong	173, 205, 000. 00	200, 855, 000. 00	227, 939, 000. 00	822, 149, 000. 00	252, 252, 000. 00	505, 680, 000. 00	17, 629, 500. 00
Vehicle Life-Years	8. 00	8. 50	8. 50	8. 00	8. 00	7. 50	6. 00
Vehicle Life Km	104, 000. 00	255, 000. 00	382, 500. 00	320, 000. 00	224, 000. 00	322, 500. 00	150, 000. 00
Vehicle Annual Km	13, 000. 00	30, 000. 00	45, 000. 00	40, 000. 00	28, 000. 00	43, 000. 00	15, 000. 00
Vehicle Life Operating Hours	4, 000. 00	10, 200. 00	12, 750. 00	12, 800. 00	9, 600. 00	11, 250. 00	3, 600. 00
Vehicle Annual Operating Hours	500. 00	1, 200. 00	1, 500. 00	1, 600. 00	1, 200. 00	1, 500. 00	600. 00
Fuel Price Fin-Dong/Liter	3, 300. 00	3, 300. 00	2, 700. 00	2, 700. 00	2, 700. 00	2, 700. 00	3, 300. 00
Fuel Price Econ-Dong/Liter	2, 337. 00	2, 337. 00	2, 025. 00	2, 025. 00	2, 025. 00	2, 025. 00	2, 337. 00
Fuel Consumption -Liter/Km	0. 13	0. 14	0. 18	0. 25	0. 27	0. 30	0. 03
Tire Unit Price Fin-Dong/Piece	855, 460. 00	855, 460. 00	1, 657, 636. 00	2, 334, 321. 00	2, 334, 321. 00	2, 334, 321. 00	855, 460. 00
Tire Unit Price Econ-Dong /Piece	777, 691. 00	777, 691. 00	1, 823, 400. 00	2, 122, 110. 00	2, 122, 110. 00	2, 122, 110. 00	777, 691. 00
Number of Tires	4. 00	4. 00	4. 00	6. 00	6. 00	10. 00	2. 00
Tire Life -Km	30, 000. 00	30, 000. 00	30, 000. 00	40, 000. 00	40, 000. 00	40, 000. 00	30, 000. 00
Lubricants Price Fin-Dong/Liter	3, 300. 00	9, 417. 00	13, 320. 00	20, 038. 00	9, 417. 00	18, 067. 00	3, 300. 00
Lubricants Price Econ-Dong.Liter	2, 310. 00	6, 592. 00	9, 324. 00	14. 026. 00	6, 592. 00	13, 550. 00	2, 310. 00
Lubri. Oil Consumption-Liter/100km	1. 20	1. 30	2. 00	2. 20	3. 00	3. 40	0. 20
Maintenance Spare/Year-%	7. 00	8. 00	8. 00	10. 00	8. 00	8. 00	3. 00
Maintenance Labor-Hour/1000km	3. 00	7. 00	15. 00	15. 00	12. 00	15. 00	2. 00
Maintenance Labor Cost Fin-Dong/Hour	10, 293. 00	10, 393. 00	11, 837. 00	10. 837. 00	13, 381. 00	20, 586. 00	10, 393. 00
Maintenance Labor Cost Econ-Dong/Hour	8, 234. 00	8, 234. 00	9, 469. 00	9, 469. 00	10, 705. 00	16, 468. 00	8, 234. 00
Depreciation. Distance Related-%	60. 00	70. 00	80. 00	85. 00	70. 00	70. 00	60. 00
Depreciation. Time Related-%	40. 00	30. 00	20. 00	15. 00	30. 00	30. 00	40. 00
Opportunity Cost of Capital-%	12. 00	12. 00	12. 00	12. 00	12. 00	12. 00	12. 00
Real Time of Interest of Capital-%	8. 00	8. 00	8. 00	8. 00	8. 00	8. 00	8. 00
Overhead Cost/Annum Fin-Dong	0. 00	3, 285, 000. 00	7, 391, 250. 00	6, 570, 000. 00	3, 066, 000. 00	7, 062, 750. 00	0. 00
Overhead Cost/Annum Econ-Dong	0. 00	3, 285, 000. 00	7, 391, 250. 00	6, 570, 000. 00	3, 066, 000. 00	7, 062, 750. 00	0. 00
Crew-Number (Driver)	0. 00	1. 00	1. 00	1. 00	1. 00	1. 00	0. 00
Crew-Number (Assistant)	0. 00	0. 00	1. 00	1. 00	1. 00	1. 00	0. 00
Crew Unit Cost Fin-Dong/Hour	0. 00	9, 112. 00	9, 112. 00	10, 478. 00	10, 478. 00	10, 478. 00	0. 00
Crew Unit Cost Econ-Dong/Hour	0. 00	8, 200. 00	8, 300. 00	9, 430. 00	9, 430. 00	9, 430. 00	0. 00

Table A1.5: Unit Vehicle Operating Cost Per Km by Base Speed

Unit : Dong

	Passenger Car	Van	Med-Bus	Large Bus	Medium Truck	Hvy. Truck	Motor Cycle
Basic Financial Running Costs							
Fuel Costs	429.00	462.00	486.00	675.00	729.00	810.00	99.00
Lubricant Costs	3.96	12.24	26.64	44.08	28.25	61.43	0.66
Tire Costs	114.06	114.06	221.02	350.15	250.15	583.58	57.03
Maintenance Spares Costs	144.04	74.13	54.80	295.31	99.00	138.42	3.95
Maintenance Labor Costs	30.88	72.75	177.56	162.56	160.57	308.79	20.79
Depreciation Costs	1,234.62	648.67	547.97	2,510.16	866.25	1,211.16	79.04
Total Costs/Vehicle-km	1,956.55	1,383.85	1,513.98	4,037.26	2,233.22	3,113.38	260.47
Basic Financial Fixed Costs							
Capital Costs (Depreciation-Time rel.)	21,400.00	6,950.00	4,109.80	11,074.22	8,662.50	14,880.00	2,195.56
Long Term Interest Costs	51,360.00	23,630.00	20,960.00	70,875.00	27,720.00	44,640.00	3,952.00
Overhead Costs	0.00	2,737.50	4,927.50	4,106.25	2,555.00	4,708.50	0.00
Crew Costs	0.00	9,112.00	18,224.00	20,956.00	20,956.00	20,956.00	0.00
Fixed Costs, All	72,760.00	42,429.50	48,221.30	107,011.47	59,893.50	85,184.50	6,147.56
Factor	0.50	0.70	0.70	0.70	0.70	0.70	0.70
Total Costs/Vehicle-hour	36,380.00	29,700.65	33,754.91	74,908.03	41,925.45	59,629.15	4,303.29
Costs/Vehicle-km	519.71	424.30	482.21	1,070.11	598.94	851.85	61.48
Total Financial Cost/Vehicle-km	2,476.27	1,808.15	1,996.20	5,107.37	2,832.16	3,965.22	321.94
Basic Economc Running Costs							
Fuel Costs	303.81	327.18	364.50	506.25	546.75	607.50	70.11
Lubricant Costs	2.77	8.57	18.65	30.86	19.78	46.07	0.46
Tire Costs	103.69	103.69	243.12	318.32	318.32	530.53	51.85
Maintenance Spares Costs	116.58	63.01	47.67	256.92	90.09	125.44	3.53
Maintenance Labor Costs	24.70	57.64	142.04	142.04	128.46	247.02	16.47
Depreciation Costs	999.26	551.37	476.74	2,183.83	788.29	1,097.60	70.52
Total Costs/Vehicle-km	1,550.82	1,111.46	1,292.71	3,438.21	1,891.68	2,654.16	212.93
Basic Economic Fixed Costs							
Capital Costs (Depreciation-Time rel.)	17,320.50	5,907.50	3,575.51	9,634.56	7,882.88	13,484.80	1,958.83
Long Term Interest Costs	41,569.20	20,085.50	18,235.12	61,661.18	25,225.20	40,454.40	3,525.90
Overhead Costs	0.00	2,737.50	4,927.50	4,106.25	2,555.00	4,708.50	0.00
Crew Costs	0.00	8,200.00	16,600.00	18,860.00	18,860.00	18,860.00	0.00
Fixed Costs, All	58,889.70	36,930.50	43,338.13	94,261.98	54,523.08	77,507.70	5,484.73
Factor	0.50	0.70	0.70	0.70	0.70	0.70	0.70
Total Costs/Vehicle-hour	29,444.85	25,851.35	30,336.69	65,983.39	38,166.15	54,255.39	3,839.31
Costs/Vehicle-km	420.64	369.31	433.38	942.62	545.23	775.08	54.85
Total Economic Costs/Vehicle-km	1,971.46	1,480.76	1,726.09	4,380.83	2,436.91	3,429.23	267.78

5. Factors and their Relation to Vehicle Operation Cost Calculation

Vehicle operating costs are determined by various factors, the most important of which are the following:

1. Road:	alignments, surface type and condition
2. Traffic:	volumes in relation to capacity, traffic composition
3. Vehicle:	type, age, general condition, load
4. Driver:	skill, mentality, mood
5. Climate:	temperature, humidity

These factors mentioned above are closely related to each other. For example, the speed is often used as a main variable in VOC calculation and is then related to fuel consumption, tire wear, maintenance, capital costs, etc. Improvement of a road may then result in higher average speed, and thus lead toward a higher annual mileage. However, another problem consequence of this is also the shortening of the lifetime of vehicle, although this is not completely proportionally inversed. Thus, when the influence of individual variable is estimated, possible interrelations should be identified.

Table A.1.6 shows economic VOC by vehicle type and by driving speed. Fuel consumption, lubricant oil consumption, tire wear, maintenance costs (parts, labor, depreciation, interest, crew wage, and overhead cost) are all related to driving speed.

Table A1.6: Composite Unit of VOC (Economic)

(Dong)

Km/Hour	Passenger Car	Bus	Truck	Motorcycle
10.00	4,081.02	5,328.61	5,780.43	394.98
15.00	3,746.12	4,855.83	5,267.57	367.69
20.00	3,436.94	4,620.32	4,803.32	344.56
25.00	3,153.49	4,322.09	4,387.69	325.57
30.00	2,895.76	4,061.13	4,020.67	310.74
35.00	2,663.76	3,837.45	3,702.27	300.05
40.00	2,457.48	3,651.04	3,432.48	293.52
45.00	2,276.93	3,501.91	3,211.31	291.13
50.00	2,122.10	3,390.05	3,038.75	292.90
55.00	1,993.00	3,315.47	2,914.81	298.81
60.00	1,889.62	3,278.16	2,839.48	308.87
65.00	1,811.97	3,278.13	2,812.77	323.09
70.00	1,780.04	3,315.37	2,834.67	341.45
75.00	1,733.84	3,389.89	2,905.19	363.97
80.00	1,733.36	3,501.68	3,024.32	390.63
85.00	1,758.61	3,650.75	3,192.07	421.45
90.00	1,809.58	3,837.09	3,408.43	456.41
95.00	1,886.28	4,060.71	3,673.41	495.53
100.00	1,988.70	4,321.60	3,987.00	538.79

APPENDIX 2 Travel Time Cost of Passenger

1. Annual Income per Passenger

Improvement of the project road will enhance driving speed, and save time for passengers of all vehicles. When saved time is used productively, it can be considered as a benefit brought about by the project.

Time value differs according to income of passengers. Passenger time value is a function of the wage rate. Thus annual income per worker is calculated as 1,290,446 dong by dividing the wage per passenger of the study area by number of workers.

Table A2.1: GDP per Worker in the Study Area

Items	GDP and Workers
GDP of the Study Area 1994	5,197,000 Million Dong
GDP Growth Rate 1994-1995	10.93%
GDP in the Study Area 1995	5,765,032 Million Dong
Population of the Study Area 1995	9,927,714
Percentage of Workers	45%
Number of Workers 4,467,471	4,467,471
GDP per worker of the Study Area	1,290,446 Dong

2. Time Value Based Upon Annual Income per Passenger

Time value of car and bus passengers was calculated separately according to their differing incomes. Based upon the "Statistical Data on Labor and Social Affairs 1994," the average income of the wealthier classes who are car users amounts to 4.53 times more than the average income (refer to Table A.2.2). Thus this class of people is considered as car passengers.

Table A2.2: Income Structure in Study Area/Month

Income Class	Average	% of Total
Upper class	445,690 Dong	2%
Lower upper class	173,750 Dong	15%
Middle class	94,540 Dong	37%
Lower middle class	62,050 Dong	25%
Lower class	38,980 Dong	21%
Total	815,010 Dong	100%

Source: Statistical data on labor and social affairs, 1994

Average income of motorcycle users is considered in between car passengers and bus passengers. Accordingly, the time value of income per hour for annual working hours of 1,800 is as shown in Table A.2.3

Table A2.3: Time Value Based on Income

Items	Income/Year	Time Value/Hour
Income level of car passenger	5,845,722 Dong	3,248 Dong
Income level of bus passenger	1,290,446 Dong	717 Dong
Income level of motorcycle passenger	3,568,084 Dong	1,982 Dong

3. Time Value of Trips by Type of Vehicle

The time value of trips ought to be different from time value of working hours. Time value of trips is estimated in accordance with trip purposes. In general, business trips are normally valued 100% of wage rate for all vehicles while other trips are valued at 60% in this study.

Table A2.4: Value Composition of Trip Time

	Trip Purpose			Value Composition Ratio of Trips			
	Work	Non-Leisure	Leisure	Work	Non-Leisure	Leisure	Total
Passenger car	35%	50%	15%	35%	50%	0%	85%
Bus	15%	65%	20%	15%	39%	0%	54%
Motorcycle	35%	50%	15%	35%	50%	0%	85%

Drivers of passenger cars and motorcycles are considered as passengers. In the case of bus drivers, they are excluded from passengers as they are included in vehicle operating costs as crew cost under restriction. Trip time value based on income and trip purpose is calculated.

Table A2.5: Time Value by Vehicle Types

Vehicle	No. of Passengers	Pax/Hour	Pax/Minute
Passenger car	2.80	7,730 Dong	128.8 Dong
Bus	29.30	11,344 Dong	189.1 Dong
Motorcycle	1.06	1,685 Dong	28.1 Dong

Time value is assumed to be the same throughout the project life. The future growth rate of GDP is a factor of traffic increase.

APPENDIX 3 Time Cost of Cargo

1. Introduction

Generally, the time cost of a cargo truck is calculated based on the following factors:

- cost of driver and other personnel,
- rental fee of truck, and
- interest of the loaded cargo of the truck.

However, with the limited data and the comparison of the travel time cost of a car, bus and motorcycle, it is considered that the travel time cost of truck is equivalent only to the interest (12%/year) of the load of the cargo truck.

2. Preconditions

Following are the preconditions of the estimation of travel time cost of trucks:

1) Based on the traffic count survey and Hai Phong Port transport survey of this study, it is assumed that the typical type of cargo truck to/from Haio Phong Port and the cargo truck of other traffic are large trucks with capacity of 24 tons and ordinary trucks with capacity of 12 tons, respectively.
2) It is assumed that the load factor of trucks is 44% based on the Hai Phong Port transport survey.
3) The typical type of freight cargo and its share are summarized in Table A3.1 based on the Hai Phong port transport survey.

Considering the above preconditions, the unit cost of a truck per kg is shown in Table A3.1.

Table A3.1: Unit Cost of Cargo Trucks per kg

Items		Percentage	Unit cost (dong/kg)	Unit cost/ truck (dong/kg)
1	Farming product	38.0	12,500	4,750
2	Agricultural materials	20.0	3,000	600
3	Construction materials	19.0	800	152
4	Machinery & Electric/electronic accessories	17.0	315,000	53,550
5	Clothing and shoes	6.0	157,500	9,450
Total		100.0		**68,502**

Note a. Cost is 1995 price.
b. 1, 5: 'Statistical Yearbook 2001 by General Statistics Office'
c. 2, 3: 'Reports on Markets & Process by General Statistical Department'
d. 4: Assuming twice the volume of clothing and shoes

3. Time Cost of Cargo Truck

Based on the above, the travel time cost of cargo truck to/from Haio Phong Port and the cargo truck of other traffic are calculated as follows:

- Cargo truck to/from Haio Phong Port
  : 24,000＊44%＊68,502＊12%／(365*24)＝9,909 dong/hour
- Cargo truck of other traffic
  : 12,000＊44%＊68,502＊12%／(365*24)＝4,955 dong/hour

APPENDIX 4 Economic Analysis of Red River Delta road network

1. Introduction

The major roads of the Red River Delta road network are Highway No. 5, Highway No. 10 and Highway No. 18. The improvement of Highway No. 10 and No. 18, together with the improved Highway No. 5, greatly impacts not only the areas alongside these roads but also the area of the Red River Delta. And the expectation is that a new economic zone of the region, which will be connected by the transport corridors, will be created due to the activities generated by land use development in the area and the acceleration of person trip and commodity flow by these roads.
Therefore, the economic analysis is assessed on the basis of the reduction of vehicle operation cost and travel time cost thanks to the Highway No. 10 and No. 18 improvement, which are the basic components of the Red River Delta road network, based on the traffic assignment on the following two cases of road network in the Red River Delta:

① With Case: All roads including the Red River Delta road network such as Highway No. 5, Highway No. 10 and Highway No. 18 are completed.
② Without Case: Only Highway No. 10 and Highway No. 18 are not yet improved.

2. Preconditions

1) Study area
The study area is 2 cities and 8 provinces in the Red River Delta region including the target roads, namely, Highway No. 5, and Highway No. 10 and Highway No. 18.

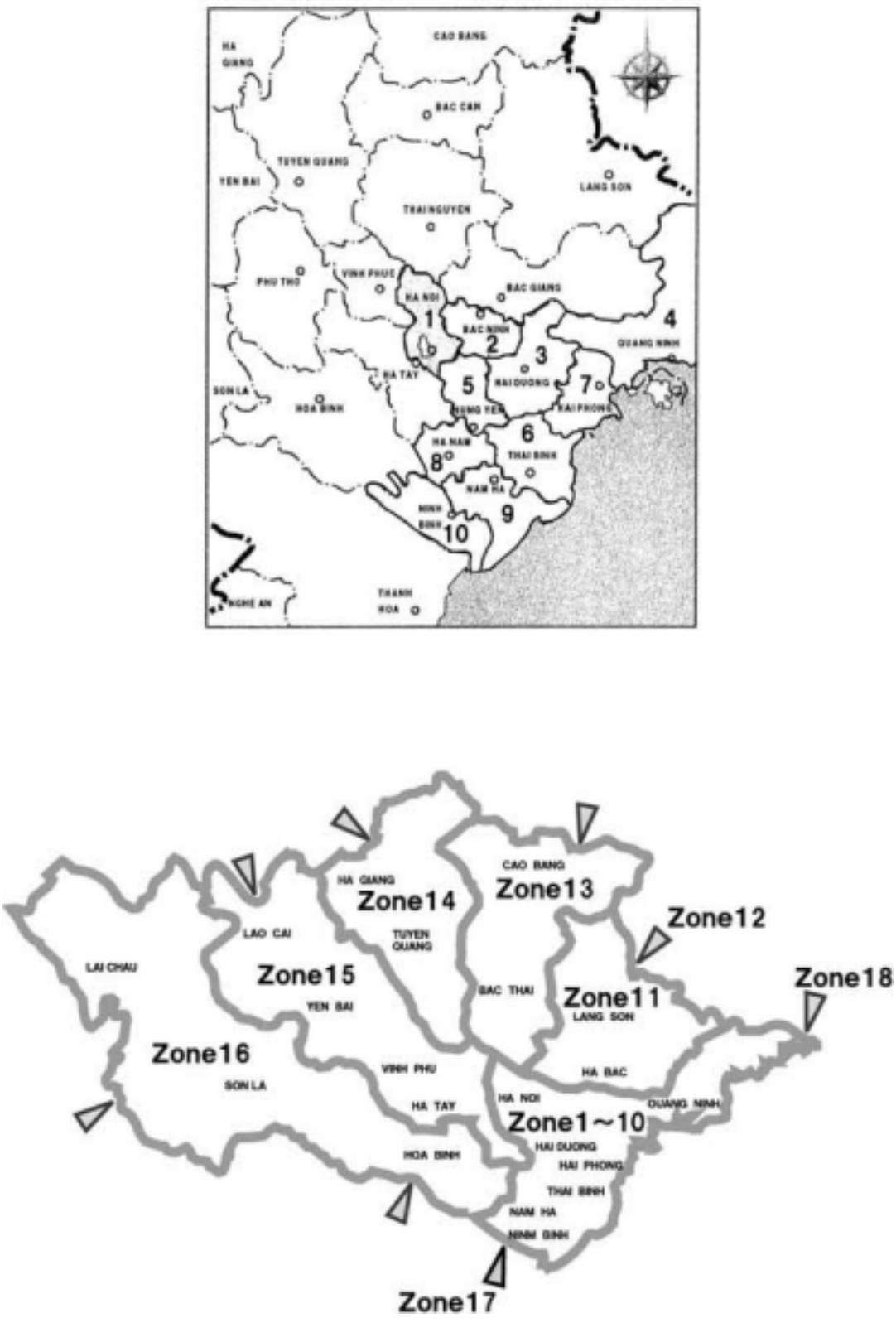
2) Zoning
The zoning of this study is made first by combining and then dividing the zoning of the Northern Vietnam Transport Master Plan in 1993 by JICA and the road network in the Red River Delta region. Concretely, the Northern and Western regions are combined and the regions in the study area such as Hai Duong and Nam Ha are divided due to the change of administrative boundary in 1996 as shown in Table A4.1 and Figure A4.1.

Table A4.1: Conversion Table of Zoning

1993 Master Plan		2003 JBIC Study	Remarks
zone No.	name	zone No.	
10	HA BAC		※BAC GIANG
3	LANG SON	11	
27	-	12	
6	BAC THAI	13	
2	CAO BANG		
26	-		
1	TUYEN QUANG	14	
17	HA GIANG		
25	-		
19	HA TAY	15	
9	VINH PHU		
5	YEN BAI		
18	LAO CAI		
24	-		
13	HOA BINH	16	
22	-		
7	SON LA		
4	LAI CHAU		
23	-		
21	-	17	
28	-	18	

1993 Master Plan		2003 JBICStudy		Percentage
zone No.	name	zone No.	name	
11	HANOI	1	HANOI	100.0%
10	HA BAC	2	BAC NINH	38.6%
			BAC GIANG	61.4%
14	HAI DUONG	3	HAI DUONG	60.6%
		5	HUNG YEN	39.4%
8	QUANG NINH	4	QUANG NINH	100.0%
15	THAI BINH	6	THAI BINH	100.0%
12	HAI PHONG	7	HAI PHONG	100.0%
20	NAM HA	8	HA NAM	29.5%
		9	NAM HA	70.5%
16	NINH BINH	10	NINH BINH	100.0%

Figure A4.1: Zoning



3) Traffic Demand (OD Table)
The OD tables (Years 2000 and 2010) for this study are prepared based on the 2000 and 2010 OD Tables of the Northern Vietnam Transport Master Plan in 1993 by JICA and the following data:

a. 2000, 2010 and 2020 OD Tables by the Feasibility Study of Highway No. 10 (SAPROF by OECF)
b. Comparison between the forecast and actual population in 2000 in the study area
c. Trend of vehicle ownership in recent years

The OD tables of the years of 2000 and 2010 are summarized in Tables A4.2 (1) and (2).

4) Road Network
The road network for this study, which formulates the Red River Delta is composed of Highway No. 5, No.10, No.18, No. 21, No. 37, No. 39 and No. 183 as shown in Figure A4.2 and Figure A4.3.

3. Traffic Assignment

Based on the above conditions, traffic assignments for the years of 2000 and 2010, and without and with cases are calculated using JICA STRADA Model. The results are illustrated in Figures A4・4 (1) and (2). The road traffic after improvement of roads (With Case) in the Red River Delta is more scattered than before improvement.

Table A4.2 (1): OD Table in 2000 (Unit: vehicle/day)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	total
1	0	1,082	1,020	976	662	382	2,936	500	1,192	474	3,250	100	1,354	384	8,904	924	1,790	134	26,064
2	1,082	0	20	560	14	4	44	2	4	0	592	12	32	44	176	10	30	40	2,666
3	1,016	20	0	334	0	40	876	16	36	30	54	0	4	4	242	2	18	0	2,692
4	978	562	334	0	218	110	1,012	24	54	114	1,008	40	88	58	574	18	36	150	5,378
5	662	12	0	216	0	26	570	10	24	20	34	0	2	2	156	2	12	0	1,748
6	380	4	42	112	28	0	138	196	470	12	30	0	24	72	102	0	140	0	1,750
7	2,934	44	878	1,014	572	140	0	26	60	130	150	60	130	28	842	62	148	94	7,312
8	500	2	16	22	10	196	26	0	0	200	2	0	28	4	212	12	98	0	1,328
9	1,192	4	36	52	24	466	62	0	0	480	6	0	66	10	500	36	232	0	3,166
10	474	0	30	118	20	12	126	202	480	0	0	0	38	2	228	16	576	0	2,322
11	3,248	592	52	1,002	34	28	150	2	6	0	1,882	288	302	74	488	22	116	76	8,362
12	100	12	0	40	0	0	60	0	0	0	288	0	0	0	0	0	0	0	500
13	1,374	32	6	88	4	24	132	28	68	36	304	0	538	662	700	12	64	0	4,072
14	376	44	0	58	0	76	30	4	10	2	74	0	668	198	408	40	4	0	1,992
15	8,894	176	244	576	160	102	850	208	498	224	484	0	708	414	1,984	1,740	432	0	17,694
16	932	12	2	18	2	0	60	14	36	10	24	0	12	42	1,738	866	40	0	3,808
17	1,786	28	20	36	14	138	148	94	228	576	110	0	78	10	436	36	0	0	3,738
18	124	38	0	160	0	0	94	0	0	0	84	0	0	0	0	0	0	0	500
total	26,052	2,664	2,700	5,382	1,762	1,744	7,314	1,326	3,166	2,308	8,376	500	4,072	2,008	17,690	3,798	3,736	494	95,092

Table A4.2 (2): OD Table in 2010 (Unit: vehicle/day)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	total
1	0	2,892	1,837	1,178	1,194	556	5,688	860	2,055	917	6,242	300	1,681	576	18,605	1,299	3,140	402	49,422
2	2,892	0	92	835	60	5	99	4	10	0	1,861	35	79	219	837	14	52	118	7,212
3	1,836	93	0	460	0	121	3,028	40	96	114	188	0	8	2	1,159	4	29	0	7,178
4	1,180	834	459	0	298	133	1,598	30	72	207	1,441	120	74	56	1,024	20	56	450	8,052
5	1,193	60	0	299	0	79	1,969	26	62	74	123	0	5	1	754	2	19	0	4,666
6	557	6	123	134	80	0	253	421	1,006	24	37	0	21	146	196	0	255	0	3,259
7	5,689	99	3,028	1,598	1,968	254	0	71	171	355	290	180	150	42	2,103	93	237	282	16,610
8	860	4	40	30	26	421	71	0	0	511	7	0	46	7	562	25	167	0	2,777
9	2,056	10	96	73	62	1,006	171	0	0	1,220	16	0	111	16	1,341	63	399	0	6,640
10	915	0	113	207	73	24	357	511	1,221	0	0	0	74	2	620	23	998	0	5,138
11	6,245	1,860	188	1,441	123	37	290	7	16	0	5,918	865	605	350	1,673	27	189	230	20,064
12	300	35	0	120	0	0	180	0	0	0	865	0	0	0	0	0	0	0	1,500
13	1,742	79	7	72	5	23	150	46	111	73	605	0	1,307	1,375	1,370	12	103	0	7,080
14	542	219	2	56	1	144	43	7	16	3	349	0	1,374	608	900	39	6	0	4,309
15	18,608	837	1,159	1,023	754	199	2,102	562	1,341	619	1,673	0	1,373	897	4,817	3,495	813	0	40,272
16	1,313	14	4	19	2	0	93	26	63	24	26	0	11	40	3,495	1,744	60	0	6,934
17	3,133	45	33	56	21	252	237	163	391	998	172	0	127	18	823	54	0	0	6,523
18	372	113	0	480	0	0	282	0	0	0	253	0	0	0	0	0	0	0	1,500
total	49,433	7,200	7,181	8,081	4,667	3,254	16,611	2,774	6,631	5,139	20,066	1,500	7,046	4,355	40,279	6,914	6,523	1,482	199,136

Figure A4.2: Road Network in Red River Delta

Figure A4.3: Road Network for Traffic Assignment

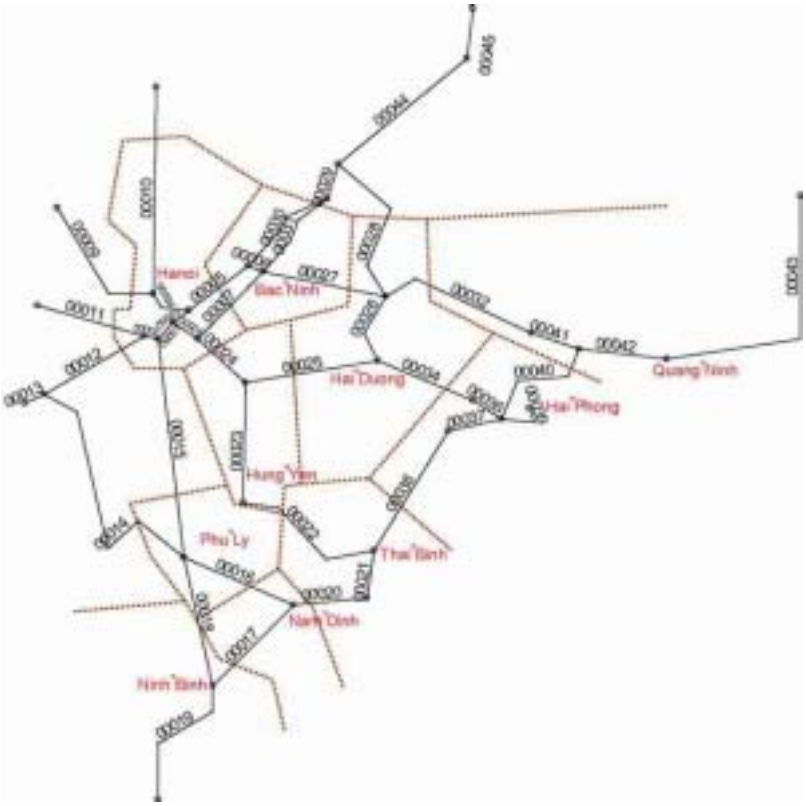
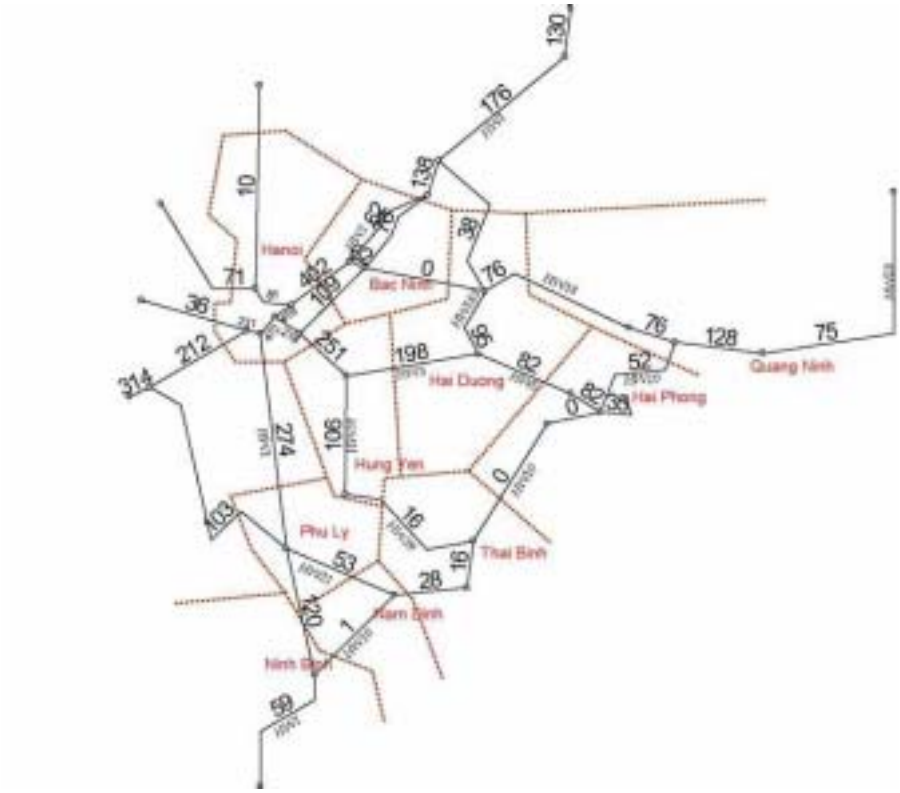


Figure 4.4 (1): Traffic Assignment on the Red River Delta Road Network in 2000

<With Case>



<Without Case>

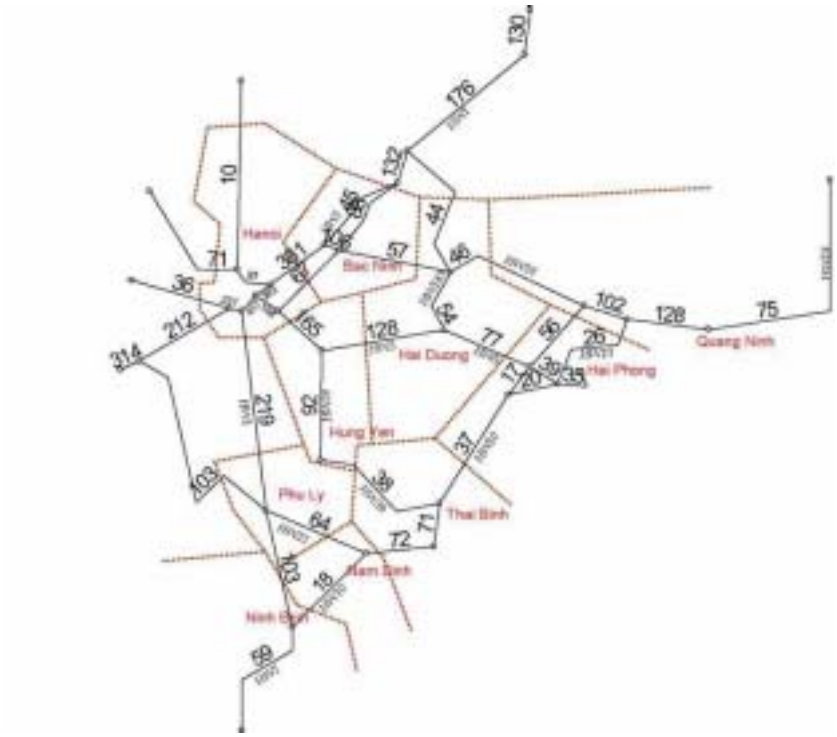
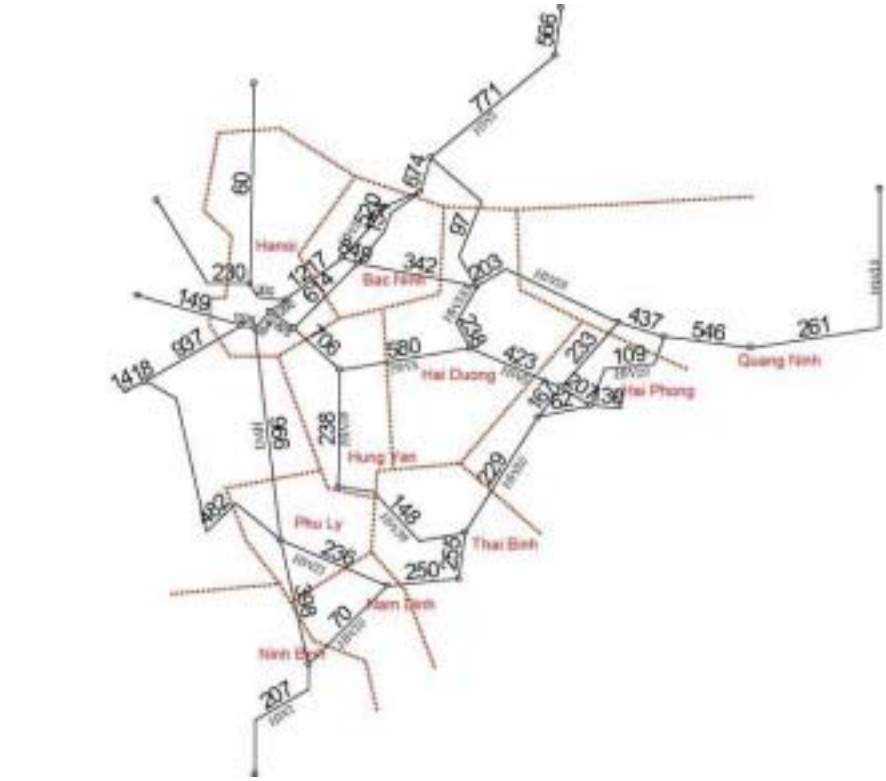


Figure A4.4 (2): Traffic Assignment on the Red River Delta Road Network in 2010

<With Case>



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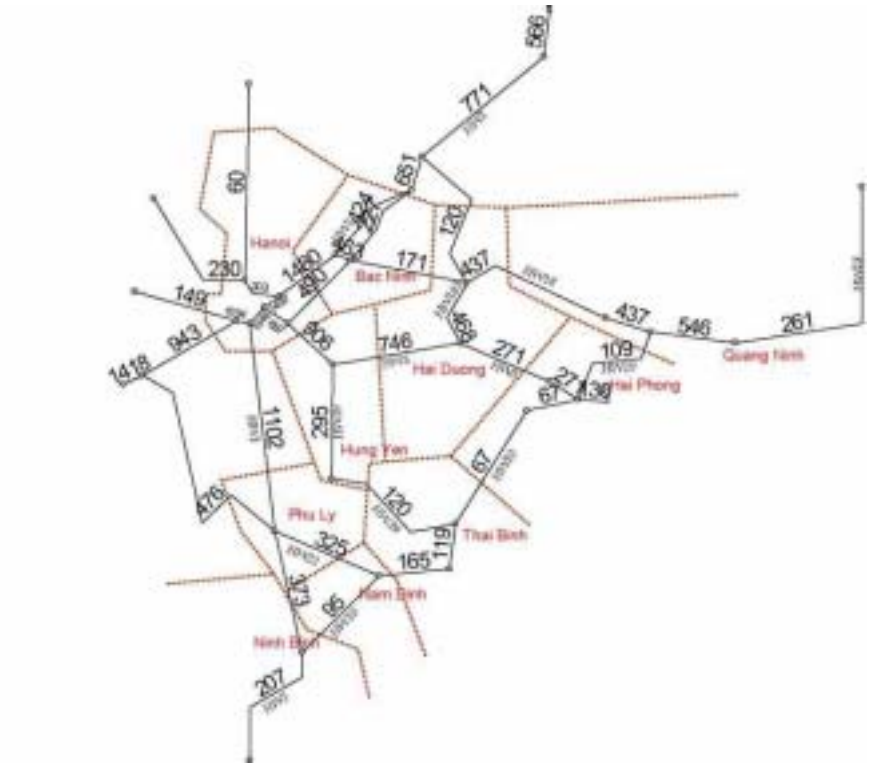

4. Cost-Benefit Analysis

1) Economic Cost
Based on the result of feasibility studies of Highway No. 10, No. 18 and Bai Chay Bridge, economic cost is summarized as shown in Table A4.4.

2) Vehicle Operating Cost and Travel Time Cost
The benefits considered for the cost and benefit analysis are the reduction of vehicle operating cost (VOC) and travel time cost (TTC) of road users by the improvement. VOC and TTC based on the feasibility study of Highway No. 18 are summarized in Table A4.5.

3) Benefit
Based on the result of traffic assignment by link (traffic volume and travel speed), and VOC and TTC, benefit of the improvement of Highway No. 10 and No. 18 is calculated as shown in Table A4.3. The benefit will start to calculate in 2004. And the benefits between 2004 and 2010 are inserted and it is assumed that after 2010 the benefits increase by 9.1% per annum based on the increase rate of trip ends between the years of 2010 and 2020, which is estimated by Feasibility Study of Highway No. 10. And it is assumed that the benefits after 2020 are constant.

4) Others
Other conditions, such as discount rate and project life, are as follows:
a. Discount rate: 12%
b. Project Life: 25 years
c. Completion year of infrastructure
Road: Year 2004 Bridge: Year 2007

5) Result of Cost-Benefit Analysis
The result of cost-benefit analysis for the improvement of Highway No.10 and No. 18 in the Red River Delta is shown in Table A4.3 and Table A4.6. The EIRR is higher than the opportunity cost of capital (discount rate = 12%). Thus, investing in these projects is economically feasible.

Table A4.3: Result of Cost-Benefit Analysis

Items	Figures
Benefit-cost Ratio (B/C Ratio)	2.451
Economic Internal Rate of Return (EIRR)	21.64%
Net Present Value (NPV)	4,938 Billion Dong

Table A4.4: Economic Cost of Highway No.10 and No. 18

Unit : Million Dong

year	HW No.10		HW No.18										Total		Grand Total
			Bac Ninh-Chi Linh		Bai Chay Brdg		Hong Gai-Cua Ong		Cua Ong-Tien Yen		Tien yen-Bac Luan				
	Capital	Mainte-nance	Capital	Mainte-nance	Capital	Mainte-nance	Capital	Mainte-nance	Capital	Mainte-nance	Capital	Mainte-nance	Capital	Mainte-nance	
1998	6,714	-	-	-	-	-	-	-	-	-	-	-	6,714	-	6,714
1999	66,636	-	-	-	-	-	-	-	-	-	-	-	66,636	-	66,636
2000	652,804	-	63,213	-	-	-	70,818	-	1,983	-	7,855	-	796,673	-	796,673
2001	644,368	-	153,644	-	-	-	107,862	-	21,020	-	46,839	-	973,733	-	973,733
2002	345,400	-	673,085	-	64,517	-	292,775	-	31,528	-	70,258	-	1,477,563	-	1,477,563
2003	351,716	-	538,467	-	204,742	-	234,221	-	-	54	-	120	1,329,146	174	1,329,320
2004	-	907	-	1,381	272,990	-	-	600	-	54	-	120	272,990	3,062	276,052
2005	-	907	-	1,381	136,495	-	-	600	-	54	-	120	136,495	3,062	139,557
2006	-	907	-	1,381	68,248	-	-	600	-	54	-	120	68,248	3,062	71,310
2007	-	907	-	1,381	-	1,436	-	600	-	54	-	120	-	4,498	4,498
2008	-	907	-	1,381	-	1,436	-	600	10,293	54	3,390	120	13,683	4,498	18,181
2009	-	1,814	-	1,381	-	1,436	35,460	600	-	54	-	120	35,460	5,405	40,865
2010	-	1,814	59,205	1,381	-	1,436	-	600	-	54	-	120	59,205	5,405	64,611
2011	-	1,814	-	1,381	-	1,436	-	600	-	54	-	120	-	5,405	5,405
2012	-	1,814	-	1,381	-	1,436	-	600	-	54	-	120	-	5,405	5,405
2013	-	45,360	-	1,381	-	1,436	-	600	-	54	-	120	-	48,951	48,951
2014	-	1,458	-	1,381	-	1,436	-	600	10,293	54	3,390	120	13,683	5,049	18,732
2015	-	1,458	-	1,381	-	1,436	35,460	600	-	54	-	120	35,460	5,049	40,509
2016	-	1,458	59,205	1,381	-	14,362	-	600	-	54	-	120	59,205	17,975	77,181
2017	-	1,458	-	1,381	-	1,436	-	600	-	54	-	120	-	5,049	5,049
2018	-	1,458	-	1,381	-	1,436	-	600	-	54	-	120	-	5,049	5,049
2019	-	2,916	-	1,381	-	1,436	-	600	-	54	-	120	-	6,507	6,507
2020	-	2,916	-	1,381	-	1,436	-	600	10,293	54	3,390	120	13,683	6,507	20,190
2021	-	2,916	-	1,381	-	1,436	35,460	600	-	54	-	120	35,460	6,507	41,967
2022	-	2,916	59,205	1,381	-	1,436	-	600	-	54	-	120	59,205	6,507	65,713
2023	-	72,900	-	1,381	-	1,436	-	600	-	54	-	120	-	76,491	76,491
2024	-	1,458	-	1,381	-	1,436	-	600	-	54	-	120	-	5,049	5,049
2025	-	1,458	-	1,381	-	1,436	-	600	-	54	-	120	-	5,049	5,049
2026	-	1,458	-	1,381	-	14,362	-	600	10,293	54	3,390	120	13,683	17,975	31,658
2027	-	1,458	-	1,381	-	1,436	35,460	600	-	54	-	120	35,460	5,049	40,509
2028	-	1,458	59,205	1,381	-	1,436	-	600	-	54	-	120	59,205	5,049	64,255
2029	-	2,916	-	1,381	-	1,436	-	600	-	54	-	120	-	6,507	6,507
2030	-	2,916	-	1,381	-	1,436	-	600	-	54	-	120	-	6,507	6,507
2031	-	2,916	-	1,381	-	1,436	-	600	-	54	-	120	-	6,507	6,507
2032	-	2,916	-	1,381	-	1,436	-	600	10,293	54	3,390	120	13,683	6,507	20,190

Table A4.5: Vehicle Operating Cost and Travel Time Cost

■Vehicle Operating Cost (Economic Price in 1995)

Unit: Dong

km/hour	Car	Bus	Truck	M/C
10.00	4,081.02	5,328.61	5,780.43	394.98
15.00	3,746.12	4,955.83	5,267.57	367.69
20.00	3,436.94	4,620.32	4,803.32	344.56
25.00	3,153.49	4,322.09	4,387.69	325.57
30.00	2,895.76	4,061.13	4,020.67	310.74
35.00	2,663.76	3,837.45	3,702.27	300.05
40.00	2,457.48	3,651.04	3,432.48	293.52
45.00	2,276.93	3,501.91	3,211.31	291.13
50.00	2,122.10	3,390.05	3,038.75	292.90
55.00	1,993.00	3,315.47	2,914.81	298.81
60.00	1,889.62	3,278.16	2,839.48	308.87
65.00	1,811.97	3,278.13	2,812.77	323.09
70.00	1,760.04	3,315.37	2,834.67	341.45
75.00	1,733.84	3,389.89	2,905.19	363.97
80.00	1,733.36	3,501.68	3,024.32	390.63
85.00	1,758.61	3,650.75	3,192.07	421.45
90.00	1,809.58	3,837.09	3,408.43	456.41
95.00	1,886.28	4,060.71	3,673.41	495.53
100.00	1,988.70	4,321.60	3,987.00	538.79

■Travel Time Cost (Economic Price in 1995)

Unit: Dong

Type of Vehicle	Occupancy	Per hour	Per minute
Car	2.80	7,730	128.8
Bus	29.30	11,344	189.1
M/C	1.06	1,685	28.1
Truck		4,955	82.6
Large Truck		9,909	165.2

Table 4.6: Cost and Benefit Analysis of Highway No.10 and Highway No. 18 Improvement

(Unit: Billion Dong)

Year	Econ. Cost	Maint. Cost	Without		With		COST	BENEFIT	B-C	Dis. Cost	Dis. Benefit	Dis. B - Dis. C	No.
			VOC	TTC	VOC	TTC	TOTAL C	TOTAL B		(12%)	(12%)	(12%)	
1998	7						7		-7	7	0	-7	1
1999	67						67		-67	60	0	-60	2
2000	797						797		-797	635	0	-635	3
2001	974						974		-974	693	0	-693	4
2002	1,478						1,478		-1,478	939	0	-939	5
2003	1,329						1,329		-1,329	754	0	-754	6
2004	273	2	7,613	1,457	7,363	926	275	781	506	139	396	256	7
2005	136	2	8,832	1,745	8,556	1,107	138	914	776	62	413	351	8
2006	68	2	10,050	2,033	9,749	1,288	70	1,046	976	28	423	394	9
2007	0	4	11,269	2,320	10,941	1,469	4	1,179	1,175	1	425	424	10
2008	14	4	12,487	2,608	12,134	1,649	18	1,312	1,294	6	422	417	11
2009	35	4	13,706	2,895	13,326	1,830	39	1,444	1,405	11	415	404	12
2010	59	4	14,924	3,183	14,519	2,011	63	1,577	1,514	16	405	389	13
2011	0	4	16,282	3,473	15,840	2,194	4	1,721	1,717	1	394	393	14
2012	0	4	17,764	3,789	17,282	2,394	4	1,877	1,873	1	384	383	15
2013	0	48	19,380	4,133	18,854	2,611	48	2,048	2,000	9	374	365	16
2014	14	4	21,144	4,510	20,570	2,849	18	2,234	2,216	3	364	362	17
2015	35	4	23,068	4,920	22,442	3,108	39	2,438	2,399	6	355	349	18
2016	59	17	25,167	5,368	24,484	3,391	76	2,659	2,583	10	346	336	19
2017	0	4	27,457	5,856	26,712	3,700	4	2,901	2,897	0	337	336	20
2018	0	4	29,956	6,389	29,143	4,037	4	3,165	3,161	0	328	328	21
2019	0	6	32,682	6,970	31,795	4,404	6	3,453	3,447	1	320	319	22
2020	14	6	35,656	7,605	34,688	4,805	20	3,768	3,748	2	311	310	23
2021	35	6	35,656	7,605	34,688	4,805	41	3,768	3,727	3	278	275	24
2022	59	6	35,656	7,605	34,688	4,805	65	3,768	3,703	4	248	244	25
2023	0	76	35,656	7,605	34,688	4,805	76	3,768	3,692	4	222	217	26
2024	0	4	35,656	7,605	34,688	4,805	4	3,768	3,764	0	198	198	27
2025	0	4	35,656	7,605	34,688	4,805	4	3,768	3,764	0	177	176	28
2026	14	17	35,656	7,605	34,688	4,805	31	3,768	3,737	1	158	156	29
2027	35	4	35,656	7,605	34,688	4,805	39	3,768	3,729	1	141	139	30
2028	59	4	35,656	7,605	34,688	4,805	63	3,768	3,705	2	126	124	31
2029	0	6	35,656	7,605	34,688	4,805	6	3,768	3,762	0	112	112	32
2030	0	6	35,656	7,605	34,688	4,805	6	3,768	3,762	0	100	100	33
2031	0	6	35,656	7,605	34,688	4,805	6	3,768	3,762	0	90	89	34
2032	14	6	35,656	7,605	34,688	4,805	20	3,768	3,748	0	80	79	35
Total	5,575	268	755,308	160,510	734,660	101,429	5,843	79,730	73,887	3,404	8,341	4,938	

B / C	2.451
EIRR %	21.64
NPV (Billion Dong)	4,938

5. Conceptual Regional Structure in the Red River Delta

The improvement of major roads such as Highway No. 5, No. 10 and No. 18 impacts not only quantitatively, as described above, but also qualitatively, as explained below, on the Red River Delta region.

Conceptual regional structure in the Red River Delta after improvement of major roads such as Highway No. 5, No. 10 and No. 18 is illustrated in Figure A4.5. The structure is basically composed of corridors, which are formulated by National Highways, and regional/provincial cores. Cores are mainly provincial centers. Before improvement of major roads, some cores were isolated, with not much person trips and commodity flows. And the impact of Hanoi, the capital city and the institutional and commercial center in Northern Vietnam, and Hai Phong Port, the only gateway in Northern Vietnam to the world by sea, was confined along the narrow Highway No. 5. However, it is expected that, with the improvement, the impact of such cores as Hanoi and Hai Phong would be distributed to the other roads, and that the person trips and commodity flows would be more accelerated through those corridors. This creates the individuality of cores and also coordinates and activates cores connected by corridors - based on the impact of the corridors- not only alongside the improved roads but also across the whole area in the Red River Delta.

Figure A4.5: Conceptual Regional Structure in the Red River Delta