



30 years of Japan-Vietnam  
Diplomatic Relation

Overview

# Linking Economic Growth and Poverty Reduction

Large-Scale Infrastructure in the Context of Vietnam's CPRGS



**GRIPS Development Forum**  
November 2003

**Linking Economic Growth and Poverty Reduction**  
**—Large-Scale Infrastructure in the Context of Vietnam's CPRGS—**  
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## Preface

This study responds to the initiative by the Government of Vietnam to expand the Comprehensive Poverty Reduction and Growth Strategy (CPRGS) to include the role of large-scale infrastructure in economic growth and poverty reduction. This initiative is based on the agreement at the 2002 Consultative Group (CG) Meeting for Vietnam (held in Hanoi), and the government plans to present a new chapter of CPRGS (on large-scale infrastructure development and poverty reduction) at the 2003 CG Meeting scheduled for December 2-3, 2003, after consulting with various stakeholders concerned.

The study aims at providing an intellectual input to the current effort by the government on the expansion of CPRGS, and is built on the government-donor partnership. While the expansion of CPRGS itself has been conducted under the ownership of the Vietnamese government, several donors (which are actively involved in the country's infrastructure development) have expressed their willingness to assist the government in parallel—particularly in the area of establishing an analytical framework regarding how large-scale infrastructure can contribute to sustainable growth and poverty reduction in Vietnam.

The study was conducted by the GRIPS Development Forum\* under the initiative of the Government of Japan and with the financial support of JBIC, in close coordination with the Government of Vietnam (through the Ministry of Planning and Investment) and the World Bank, the Asian Development Bank (ADB), UK (DFID), and Australia (AusAID).

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This is an overview of the main report. The study has greatly benefited from collaboration by the concerned partners. The GRIPS study team expresses its deep appreciation to the Government of Vietnam (MPI, MoT, MoH, EVN), provincial authorities, and donors including the World Bank, ADB, Japan (Embassy of Japan, JBIC, JICA), UK (DFID), Australia (AusAID), researchers, consultants (ALMEC) and NGOs (JOICFP) for their valuable advices and research support.

The Concept Paper for this study was distributed at the mid-term CG Meeting in Sapa in June 2003, and its preliminary findings were presented at the workshop on large-scale infrastructure, held in Hanoi in September 2003. (See <http://www.grips.ac.jp/forum-e/> for the main points discussed at the workshop.)

While the views in the document are closely coordinated with the above partners, the final responsibility rests with GRIPS Development Forum.

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\* The GRIPS Development Forum is an independent policy research unit within the National Graduate Institute for Policy Studies (Japan). The study team included: Izumi Ohno (team leader), Yumiko Niiya (researcher) and Asuka Suzuki (research assistant). The study team received support from national consultants, CONCETTI (contracted by JBIC). Kenichi Ohno provided general advice to the team.

# Linking Economic Growth and Poverty Reduction —Large-Scale Infrastructure in the Context of Vietnam’s CPRGS— Overview

## Contents

### Preface

<b>1. Objective</b> .....	1
<b>2. Economic Growth and Poverty Reduction</b> .....	1
<b>3. Analytical Framework for Assessing the Role of Large-Scale Infrastructure</b> .....	3
Linkage Effects of Large-Scale Infrastructure	
<b>4. Linkages among Infrastructure, Growth and Poverty Reduction</b> .....	5
Specific Features of Vietnam	
Findings of Case Analyses	
Cross-Cutting Issues	
<b>5. Future Role of Large-Scale Infrastructure and Aid Partnership in Vietnam</b> .....	22
Vietnam's Development Challenges and the Role of Infrastructure	
Key Issues for Future Strategic Planning	
Toward Enhanced Government-Donor Partnership	
<b>Appendices</b> .....	27
<b>Bibliography</b> .....	30

# Overview

## 1. Objective

The main objective of this study is to analyze the role of large-scale infrastructure in economic growth and poverty reduction in the context of Vietnam, with special attention to various channels and linkages among infrastructure, growth and poverty reduction. The study focuses on large-scale infrastructure (benefiting many (or more than one) provinces) in the transport and power sectors, in view of their core function as economic and industrial infrastructure to promote economic growth.

More specifically, the paper is designed to:

- Develop an analytical framework for assessing the role of large-scale infrastructure in the poverty-reducing growth process;
- Clarify various linkages among infrastructure, growth, and poverty reduction in the Vietnamese context, based on case analyses;
- Suggest their implications for the country's future development challenges; and
- Highlight key issues, considered essential for Vietnam's future strategic planning of infrastructure development and donor partnership.

The study does not intend to propose prioritization among individual projects or develop an infrastructure investment strategy. It is understood that these tasks would be handled separately by the Vietnamese Government under its future cycles of strategic planning.

## 2. Economic Growth and Poverty Reduction

There is broad consensus that growth is essential to sustained poverty reduction, although it may not be a sufficient condition. At the same time, recognizing that recent discussions on pro-poor growth tend to be narrowly focused on direct poverty-targeting measures, there has been increased awareness of the need to analyze how to generate a dynamic growth process, while ensuring social equity ("pro-poor growth" or "inclusive growth") in the country-specific context<sup>1</sup>.

To achieve sustainable growth and poverty reduction, interaction among the following three channels is critically important:

### ***Box 2-1: Three Channels of Pro-Poor Growth***

- (1) *Direct channel*, which impacts the poor directly (such as programs for basic health, sanitation, education, and rural roads);
- (2) *Market channel* (or "trickle down"), where growth helps the poor via economic linkages (such as inter-sectoral and inter-regional labor migration, increased demand, reinvestment through formal, informal and internal finance); and
- (3) *Policy channel*, which supplements the market channel and guides the development process toward greater equality (through subsidies, fiscal transfer, public investment, proper design of trade, investment and financial policies, and so on).

<sup>1</sup> For example, the PRSP progress report presented at the 2002 World Bank Annual Meeting [IMF/World Bank 2002] notes the importance of in-depth, country-specific understanding of sources of growth, elements which make growth pro-poor, and concrete policies which make pro-poor growth possible. The PRSP Unit of the World Bank (PRMPR) is currently organizing a series of studies around these topics.

Infrastructure can play a vital role in each of these channels. For example, basic rural infrastructure can address poverty problems through the direct channel. Large-scale infrastructure can contribute to growth and poverty reduction through the policy channel, but also serve as a pre-condition for realizing the market channel and affect the patterns and quality of growth. In fact, there has been increased recognition of the critical role of infrastructure investment for economic growth, as well as its linkages with the provision of social services and the attainment of the Millennium Development Goals (MDGs)[Box 2-2]. Furthermore, greater attention is being paid to the importance of addressing infrastructure needs, particularly in the context of improving the investment climate in respective developing countries and the living conditions of their peoples<sup>2</sup>.

The Vietnamese government is keenly aware of the importance of growth promotion in poverty reduction and recognizes the interaction of the channels noted above. The Comprehensive Poverty Reduction and Growth Strategy (CPRGS) has set an economic target of 7.5% of annual growth for 2001-2005 and proposes priority policies and resource requirements to achieve this goal (policy channel). At the same time, the CPRGS and the Public Investment Program (PIP) include the national targeted program for poverty reduction, and the government plans to double its funding, compared to the 1996-2000 period (direct channel) [SRV 2002a, SRV 2002b].

***Box 2-2: Infrastructure and MDGs***

**Statement by Mr. Shengman Zhang, Managing Director of the World Bank**

I know of no country that has achieved continuous development without a corresponding development of infrastructure. It would be like trying to drive a car without gas. It is hard to imagine poor people being able to link up with technology and markets if they do not have access to modern energy sources such as electricity. Another link is more indirect, but just as important, particularly from the perspective of the Millennium Development Goals: access to clean water and sanitation services contributes to reduction in child mortality. In addition, reliable transport services tend to facilitate access to schools and increase enrollment.

Thus, infrastructure development, economic growth, and poverty reduction are all connected, although causes and effects may vary. Looked at another way, to the extent that the Millennium Development Goals are ultimately about improving human welfare, we must pay attention to both social development issues and infrastructure investment needs. The two mutually reinforce each other.

(Quoted from “The Bank should Invigorate Infrastructure Lending: Interview with World Bank Managing Director Shengman Zhang” in the World Bank Newsletter, *Transition*)

Source: World Bank [2003b], *Transition* (The Newsletter About Reforming Economies), Volume 14, No. 1-3, pp.1-3, <http://www.worldbank.org/transitionnewsletter>.

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<sup>2</sup> These points were emphasized at the 2003 Spring Meeting of the World Bank/IMF Development Committee (held in Washington D.C., April 2003). More recently, the Executive Board of the World Bank approved a new infrastructure action plan in July 2003. In the OECD, DAC Network on Poverty Reduction (POVNET) also plans to include infrastructure in the 2003-05 work program.

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### 3. Analytical Framework for Assessing the Role of Large-Scale Infrastructure

It has long been recognized that infrastructure contributes to economic development by increasing productivity of firms and individuals and by enhancing the quality of life. In particular, large-scale infrastructure generates significant structural changes in national and regional economy.

Compared with small-scale infrastructure whose beneficiaries are clustered narrowly around the project site, the impact of large-scale infrastructure is much broader and more complex. It takes time to emerge fully and depends on supporting policies and the supply of other infrastructure. A comprehensive view is required to study its effect on income and employment generation. Moreover, large-scale infrastructure involves large expenditure flows. Additionally, the mode of its utilization and management affects the efficiency and the effectiveness of the infrastructure services.

Economically, large-scale infrastructure is part of investment. As such, investment has two different impacts on the economy, one through the *supply-side effect* of increasing the capital stock and the other through the *demand-side effect* of providing additional effective demand. Due to the special properties arising from its nature as "public goods," the supply-side effect of large-scale infrastructure investment should be construed as contributing to general productivity enhancement. For example, transport and energy infrastructures are intermediate inputs for firm production, and they raise the productivity of other factors. With respect to social service delivery, they contribute to improving the productivity of health workers and equipment. Consumption of infrastructure services also enhances the welfare of poor people. Furthermore, large-scale infrastructure contributes to economic growth that may provide private and public resources to reduce poverty.

Largely due to the multiplicity of linkage effects, a methodology for quantitative analysis of its poverty impacts is yet to be established. Thus, this study relies primarily on qualitative analysis<sup>3</sup>.

#### ***Linkage Effects of Large-Scale Infrastructure***

To analyze the linkage effects of large-scale infrastructure, it is important to recognize the *first round impacts* and the *broader and more general impacts* (realized through fiscal and private spending channels) on poverty reduction.

In the first round, there are two initial impacts of development of large-scale infrastructure that could lead to poverty reduction through economic growth. These are the supply-side and the demand-side effects.

- (1) *On the supply side*, improved infrastructure services in terms of costs, availability, and reliability could create, at least, two types of linkage effects:
  - *Investment-inducement effect*: This is a channel through which new investment is generated by enhanced business climate. Attraction of FDI and domestic investment could promote industrial growth, and generate jobs and income at the newly invested firms and in related industries/services (through increased procurement of local inputs and services).
  - *Regional economy activation effect*: This is a channel through which new economic opportunities are opened up, and productivity of the existing economic activities is enhanced (even without additional investment). For example, better access to markets and information could generate jobs and income in rural households through improved agricultural productivity, diversification of agricultural products, and promotion of off-farm industry in rural areas, etc.

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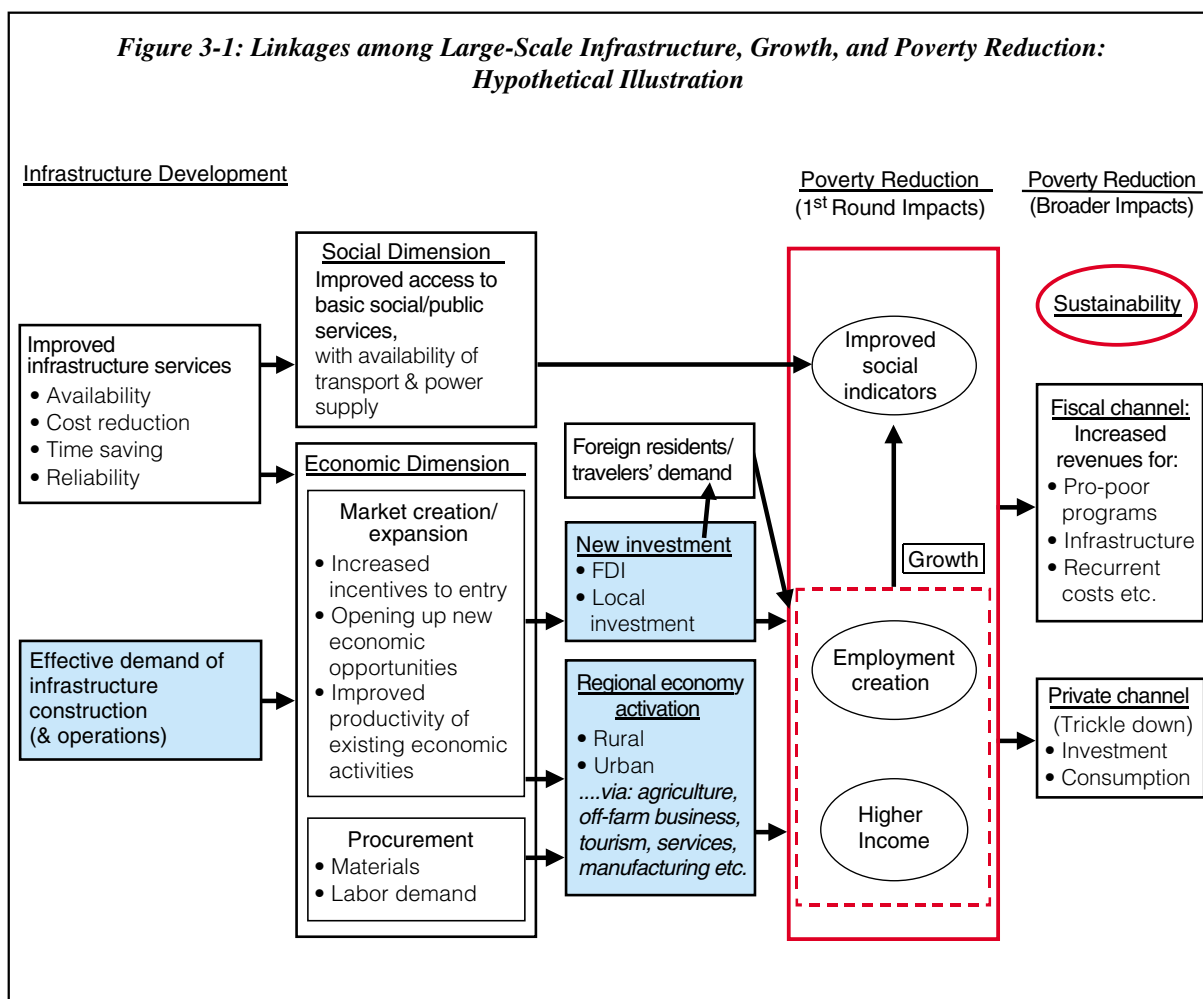
<sup>3</sup> In particular, the study team has greatly benefited from the preceding works of the ADB [Ali and Pernia 2003, Balisacan, Pernia, Asra 2002], DFID [2002], ODI [Booth et al. 2002], and IFPRI [Fan et al. 2002] in developing the analytical framework presented in this paper.



- (2) *On the demand side*, it is possible to expect the *effective demand effect of infrastructure construction*. This is a channel through which jobs and income are generated by implementing the project itself. For example, effective demand from construction work could generate jobs and income during the construction period-directly and indirectly (through the procurement of local inputs and services).
- (3) *In the social dimension*, better infrastructure services (particularly, the availability of transport and power supply) could increase access to basic social/public services and thus improve the living conditions of the poor.

Moreover, the impact of large-scale infrastructure should be understood in a broader and more general context. In the subsequent rounds, *fiscal revenue and multiplier effects* can be created. Increased fiscal revenues (through growth) could generate additional budget for pro-poor targeted programs that improve the living conditions of the poor. Private spending could also generate multiple-round impacts. This virtuous circle makes poverty reduction sustainable. (However, it should be noted that the extent and feasibility of creating such a virtuous circle depend on the government's commitment and capacity to effectively implement pro-poor programs, as well as country-specific initial conditions.)

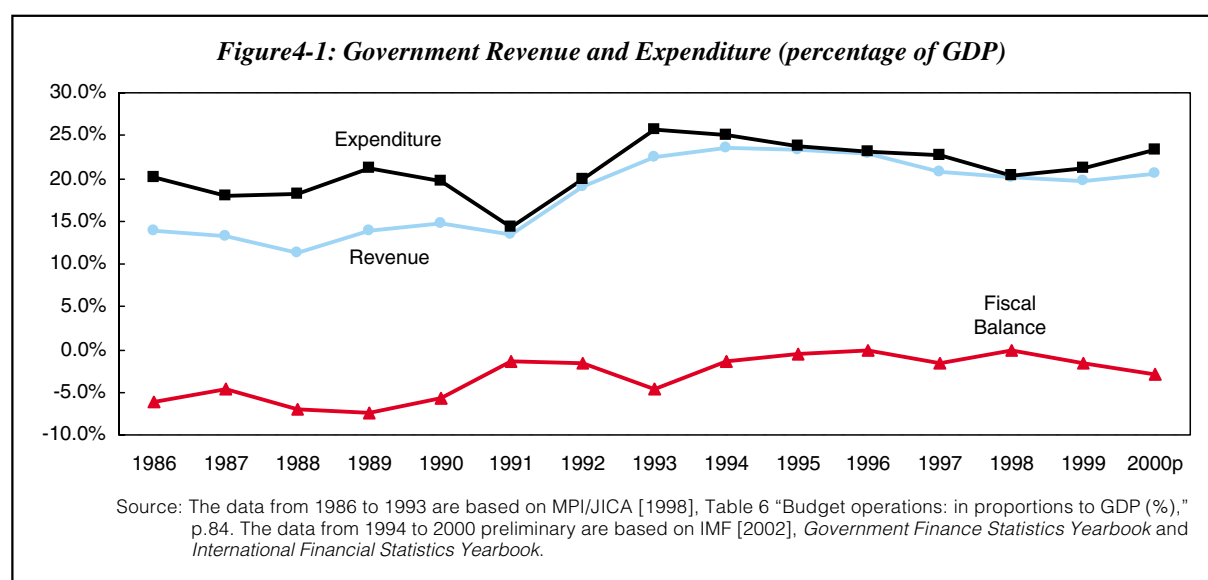
Figure 3-1 indicates hypothetical illustration of such linkages.



## 4. Linkages among Infrastructure, Growth and Poverty Reduction

### *Specific Features of Vietnam*

Vietnam's experiences in the early 1990s confirm that robust growth had raised government revenue, with the result that by the mid-1990s public expenditure on infrastructure, education, and health had risen sharply. Furthermore, because per capita GDP had increased substantially, real per capita government expenditure also increased (e.g., nearly twice as high in 1994 as in 1989)<sup>4</sup>. Greater fiscal revenue, together with increased aid flows, has enabled the government to intensify its efforts in growth promotion and poverty reduction, especially since the mid-1990s.



As the results of the latest VHLSS 2002 show, Vietnam continues to make progress in improving the living standards of the population. Between 1998 and 2002, poverty has further declined in both rural and urban areas. The percentage of population living below the poverty line decreased from 37% (in 1998) to 29% (in 2002). In all regions, household incomes of the poorest quintile increased, compared to those of 1999. Three regions—North East, South Central Coast, and Mekong Delta—have experienced a large reduction of poverty incidence. Despite such progress, poverty remains a largely rural phenomenon in Vietnam. Furthermore, the rate of reduction in rural poverty is slower than that of urban poverty, and urban-rural inequality tends to increase.

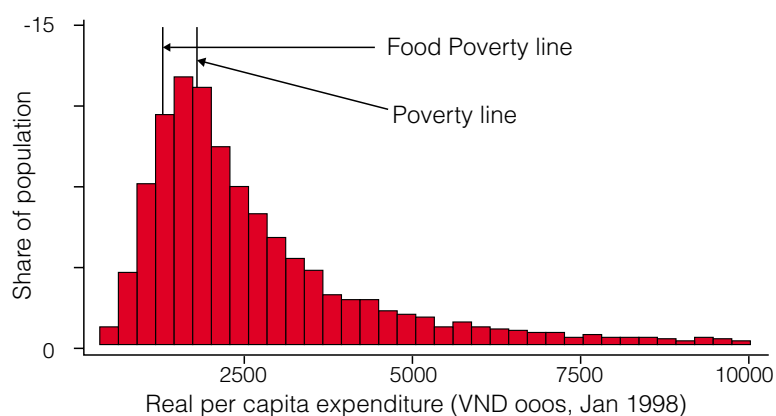
The existing studies suggest that despite several weaknesses, Vietnam has an extensive safety net by poor country standards. Public social expenditures are more equally distributed than household expenditures, playing an important re-distributive role. Other studies indicate that in Vietnam the poor and the rich are not static groups. A high proportion of the population is clustered around the poverty line. While this implies their vulnerability to shocks, it also means that even small increases in mean per capita expenditure will be quite effective in moving a large number of households over the poverty line. This suggests the effectiveness of creating income "opportunity," including "trickle-down" effects through backward and forward linkages.

<sup>4</sup> See "Macroeconomic Reform and Poverty Reduction in Vietnam" by Dollar and Litvack in Dollar et al. [1998].

### Box 4-1: Opportunities vs. Vulnerability

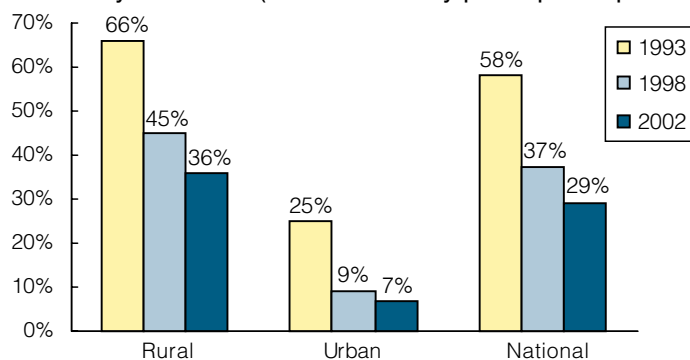
In Vietnam, a high proportion of the population is clustered just around the poverty line. Moreover, the poor and the rich are not static groups. Both quantitative and qualitative data indicate that the poverty status of households fluctuates over time.

Histogram of Per Capita expenditures, 1998



### Box 4-2: Continued Progress in Poverty Reduction and Growth Preliminary Results of VHLSS 2002

Vietnam's Poverty Incidence (as measured by per capita expenditure)



Source: GSO and World Bank estimates based on VLSS 93, VLSS 98 and GSO [2003b] based on VHLSS 2002.

Poverty Incidence by Region, 1993-2002 Headcount Index (%)

Regions	1993	1998	2002
Red River Delta	63	29	23
North East	79	59	38
North West	-	-	69
North Central	75	48	44
South Central Coast	50	35	25
Central Highland	70	52	52
Ho Chi Minh City and Vicinity	33	8	11
Mekong Delta	47	37	23

Note: In VHLSS 2002, the survey sample was selected based on the areas covered in the Population and Housing Census 1999. The sample size was greatly expanded from the previous surveys, comprising of 75,000 households representing the whole country, urban and rural areas, and 61 provinces/cities (expenditure data were compiled, based on the sample of 30,000 households).

Source: VLSS 1993, VLSS 1998, and VHLSS 2002.

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## *Findings of Case Analyses*

Case studies of selected large-scale infrastructure projects—particularly national highways and power generation and transmission constructed in the 1990s—confirm their important role in recent poverty-reducing growth in Vietnam. On the basis of the case analyses, it is fair to say that such trunk infrastructure has helped: (i) the creation of sources of growth; and (ii) the spreading of linkages between growth centers and their surrounding rural areas, particularly through the investment-inducement effect and rural-economy activation effect. A large number of the Vietnamese population has participated in and benefited from such processes. Thus, large-scale infrastructure (trunk roads and major power production) provides the foundations on which economic growth for the formal, non-farm economy is built.

Cases for this paper's analysis are selected from the large-scale infrastructure projects in the transport and power sectors, which were recently completed and are under operation:

### ***Box 4-3: Selected Large-Scale Infrastructure Projects for Case Studies***

- (1) Improvement of National Highway No.5 and the expansion of the Hai Phong Port (funded by Japan/JBIC and Taiwan, completed in 2000);
- (2) Construction of the My Thuan Bridge (funded by Australia/AusAID, completed in 2000) and the improvement of National Highway No.1 (co-financed by the World Bank, the ADB, and Japan/JBIC), with particular focus on the southern Ho Chi Minh City-Can Tho section (completed in 1999); and
- (3) Development of overall power supply capacity and regional electrification, including the construction of the North-South 500kv transmission line (financed by the Vietnamese government, completed in 1994).

In addition, three complementary analyses are conducted, in order to obtain diverse perspectives of linkages among infrastructure, growth and poverty reduction, including:

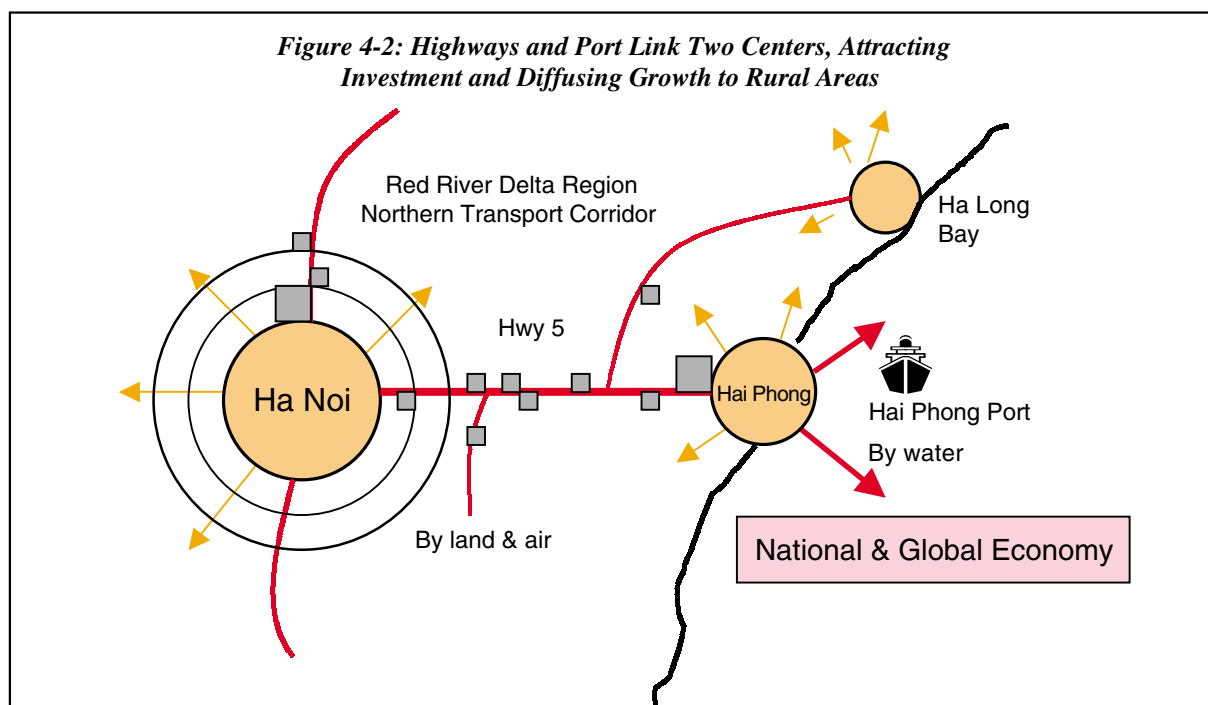
- (4) Accessibility and road network, in light of "economic distance" and "connectivity" to markets (based on the UK/DFID experience of rural road projects in Hung Yen and Lai Chau provinces);
- (5) Accessibility and road network, in light of access to social service delivery (based on the experience of Japan/JICA-supported reproductive health project in Nghe An province); and
- (6) Effective demand of highway construction (based on Japan/JBIC-funded National Highway No.18).

The main findings of the case analyses are as follows:

#### **(1) Hanoi-Hai Phong northern transport corridor—linking two centers, attracting investment and diffusing growth to rural areas.**

In the north, the improvement of National Highway No.5 (NH5) and the expansion of the Hai Phong Port, together with other infrastructure, has strengthened the Hanoi-Hai Phong transport corridor. Travel time between the two centers—Hanoi and Hai Phong—was cut by half (from 3.5-4 hours to 1.5-2 hours), and the traffic volume on NH5 doubled during 1999-2003. The volume of container cargo handled at the Hai Phong Port increased 50% during the period 2001-2002. The corridor has reinforced the link between two growth centers and in particular, has enhanced the access of Hanoi (largest city in the north) to global markets by improved land and sea transport. After 2000, FDI to major industrial zones (i.e., Thang Long, Noi Bai, Sai Dong B, Nomura-Haiphong Industrial Zones) increased significantly, and is now becoming a driving force of industrial output in the north. As of mid-2003, the four IZs accounted for about 85% of the entire FDI to northern IZs, both in terms of the number of projects and registered capital. Two-thirds of these investments came in or after 2000. A recent firm survey also suggests that nearly 90% of new FDI to the north would not have been realized without the improvement of the two transport facilities.

Moreover, this growth has spread to neighboring areas (particularly Hung Yen and Hai Duong), and the rural economy has experienced major structural transformation. Domestic investment to these areas has increased, and rural households have diversified their agricultural production. In this connection, it is important to recognize the link between feeder roads and trunk roads in enhancing the activation of the rural economy. The transport corridor has spurred tourism in Ha Long Bay by pushing up demand for tourism (e.g., day trips) and facilitating business. The number of tourists (both Vietnamese and foreign) quadrupled from 1995 to 2002, with a sharp increase from 2000. During 1995-2001, tourism turnover increased by more than five times (with a 45% increase from 2000 to 2001 alone). The figure below shows these effects schematically.



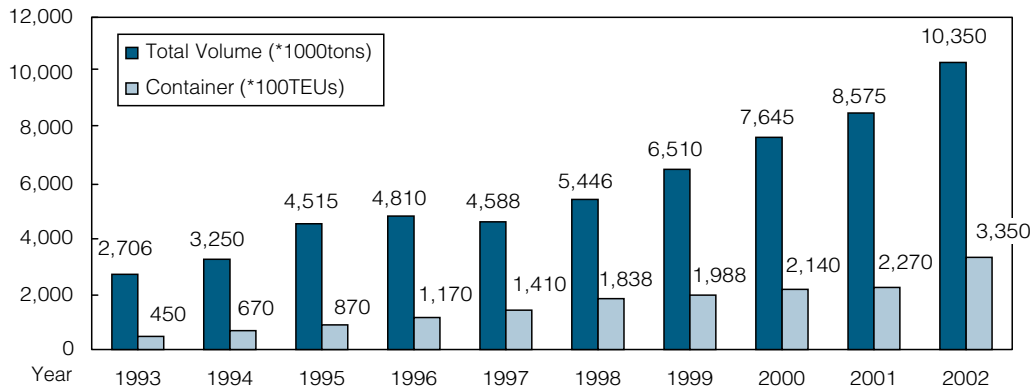
All these effects contributed to the creation of new employment and income for workers at factories and hotels (direct jobs), and for the transport industry and services (indirect jobs). Industrial FDI has created a large number of direct jobs. As of mid-2003, FDI firms at the four major IZs employed a total of 14,000 workers. Workers receive higher salaries than before, an important income source for their households. Increased cargo volume at Hai Phong Port has stimulated demand for transport industry and services, and truck drivers in Hai Phong city receive higher incomes and heavier workloads. Rural households now enjoy higher disposable income, and their purchasing power appears to have increased. The existing data also indicate that from 1995 to 2000, most of the provinces along the Hanoi-Hai Phong corridor achieved faster growth in per capita income and reduction in the number of poor households, compared to the average for the Red River Delta or the whole country. Nevertheless, FDI contribution to the total industrial labor force remains small relative to its contribution to industrial output. This is partly because most FDI firms are in the early stages of operations, and greater impacts can be expected in the future. (Also, the figure may partly reflect redundant labor at inefficient firms, especially large SOEs.) At the same time, developing supporting industries is a major challenge for Vietnam's industrialization.

**Box 4-4: Hanoi-Hai Phong Corridor—Impact on Traffic**

National Highway No.5 (NH5) is a 2-lane truck road of approximately 100km connecting the national capital Hanoi and Hai Phong Port, the largest international port in northern Vietnam. The corridor is a crucial element for the competitiveness of northern Vietnam, i.e., one of the most important arteries for traffic flow of export and import goods, as well as of domestically commercialized products. However, previously, the highway was narrow and deteriorated. The road network in the region was not linked due to rivers without bridges. Hai Phong Port did not have a container-specialized facility.

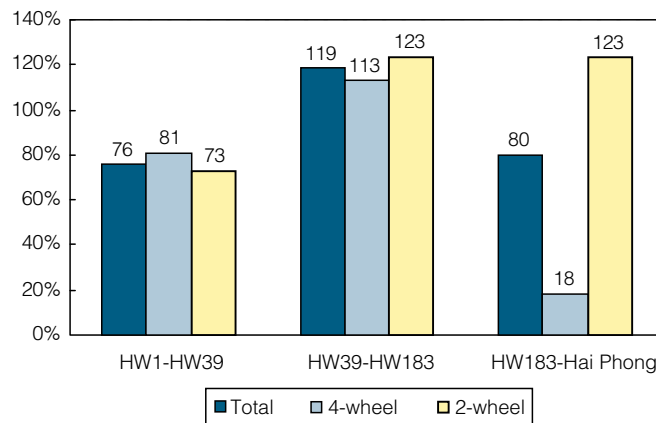
The implementation of the two infrastructure projects, with external funding, has reinforced the transportation network—by improving connections with the other trunk roads (e.g., NH1, NH10 and NH18) which have been also upgraded—and has enabled the further expansion of container cargo handling capacity at the Hai Phong Port to cope with increased traffic demand. Moreover, there have been parallel improvements in rural (feeder) roads in the surrounding areas, financed from various sources (local budget, commune contributions, donors, etc.).

**Cargo Throughput in Hai Phong Port (1993-2000)**



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

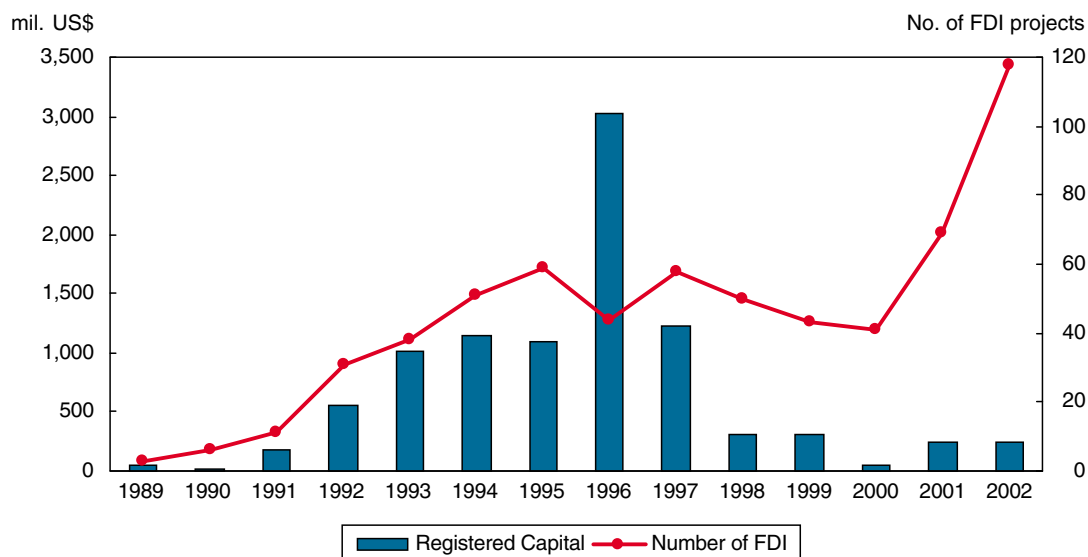
**Traffic Volume of Highway No.5  
Percentage Increase from 1999 to 2003**



Note: Highway No.5 intersection with  
 HW 1: Gia Lam  
 HW39: Connected to Yen My and Hung Yen towns  
 HW183: Hai Duong

Source: Elaborated by the study team, based on JBIC/IDCJ [2003].

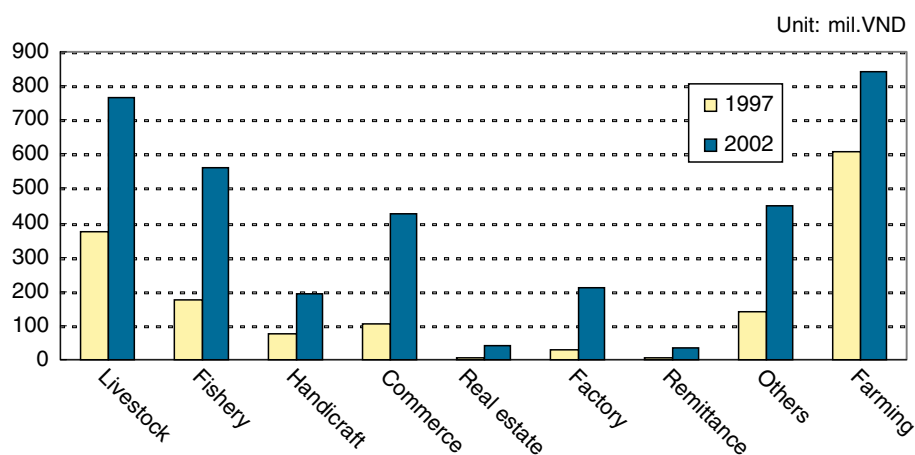
**Figure 4-3: Trend of FDI Inflow to the Four Provinces along the Highway No.5**



Note: The figure includes non-industrial FDI.

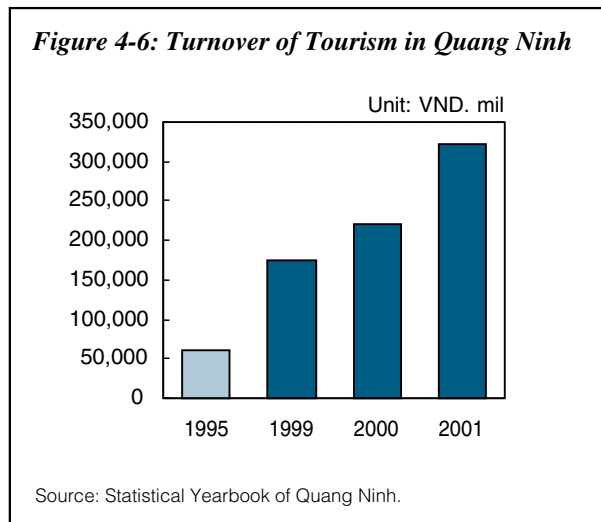
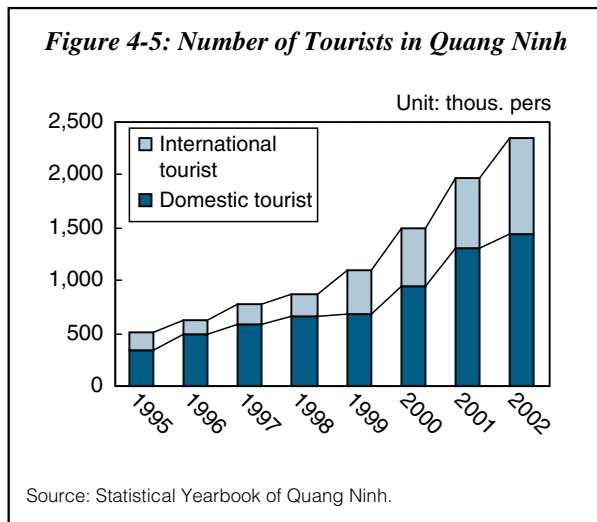
Source: JBIC/IDCJ [2003].

**Figure 4-4: Structure of Average Income of the Surveyed Households: 1997-2002**



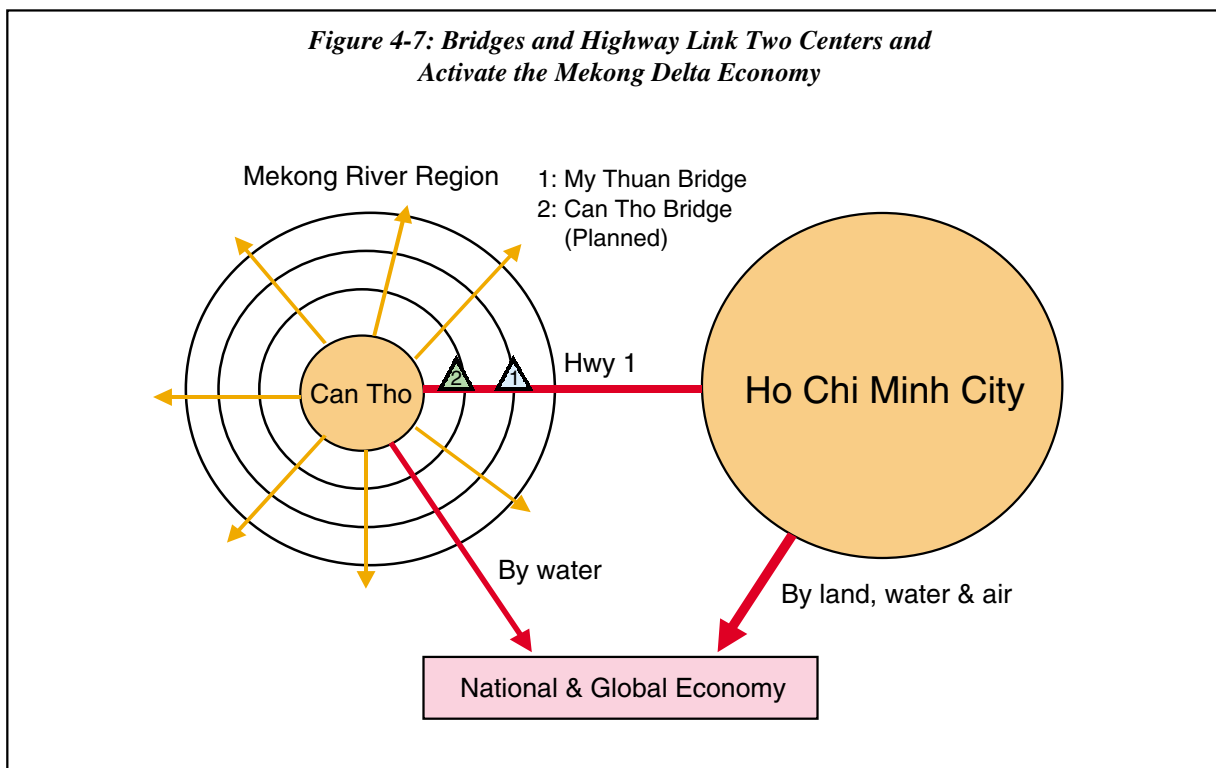
Note: The sample covers 206 rural households in six communes in Hung Yen and Hai Duong provinces. The rural household survey was conducted during February-March 2003.

Source: JBIC/IDCJ [2003].



**(2) My Thuan Bridge and National Highway No.1—linking two centers, opening up and activating the Mekong Delta economy.**

In the Mekong Delta, the construction of the My Thuan Bridge and the improvement of National Highway No.1 (NH1) have greatly changed the nature and volume of the economic linkage between Ho Chi Minh City (the largest city in Vietnam) and Can Tho (the commercial center of the entire Mekong Delta). After the opening of the My Thuan Bridge in 2000, travel time between the two centers was reduced from 4.5-5 hours to 3.5 hours (with the time for crossing the Tien River being cut from 32 to 5-6 minutes, and further time reduction thanks to road improvement). Freight and passenger movement has significantly increased, almost threefold at the My Thuan Bridge between 1999-2002. Can Tho is the fastest growing province in the Mekong Delta, and its industrial growth has accelerated, particularly from 2000. Can Tho province currently has three industrial zones (Tra Noc I and II, and Hung Phu Industrial Zones). Altogether they boast about 80 firms (including about 20 FDI firms), employing 13,000 workers. Easier transport has also promoted tourism development in Can Tho, particularly since 2000.





Moreover, the available data suggest broader impacts brought about by the improved land transport, namely, strengthened function of NH1 as the main artery linking HCMC and the Delta cities, and spreading of benefits to the provinces beyond NH1 (e.g., An Giang) and to the area where improvement has not yet taken place (e.g., south to Can Tho). It is expected that the proposed Can Tho bridge will further stimulate economic dynamism in the Mekong Delta. As the Can Tho economy is activated, its effect will be felt throughout the Mekong Delta region, in both the provinces through which NH1 passes and in those through which it does not. Figure 4-7 shows this effect schematically.

**Box 4-5: My Thuan Bridge and National Highway No.1-Impact on Traffic**

The Mekong Delta, which accounts for nearly 40% of agricultural production and about one-third of agricultural GDP in Vietnam, is the most important agricultural product base. National Highway No.1 (NH1) is the only road that links the Mekong Delta at the southern end of Vietnam to the remainder of the country. However, the transportation was not smooth due to the degraded road condition and interruption by branches of the Mekong River, which was crossed by ferry.

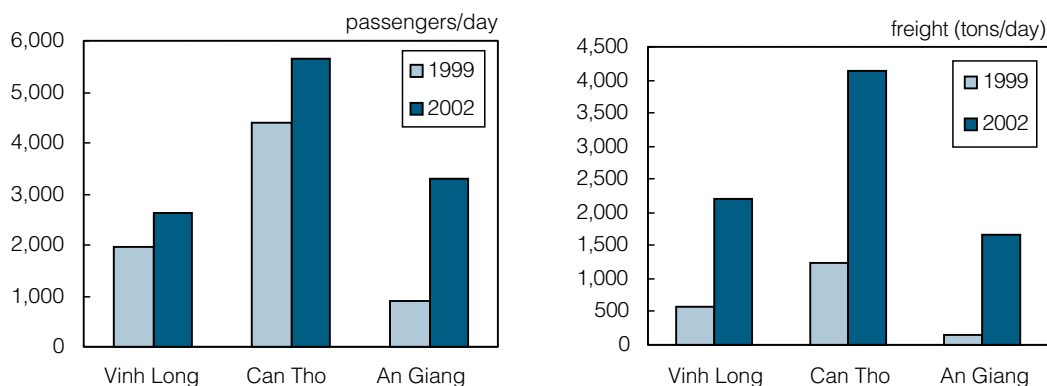
The upgrading of NH1 has been the top priority project in the infrastructure development strategy of Vietnam and the access route to the Mekong Delta was one of the first corridors to benefit from this strategy. Two large-scale infrastructure projects—the improvement of NH1 (including HCMC to Can Tho section) and the construction of the My Thuan Bridge across the Tien River—were implemented by external funding. The existing studies show major increase in traffic volume after the completion of the two projects.

Traffic at My Thuan Bridge, Forecast and Actual

	(average daily)			
	1999		2002	
	Forecast	Actual (ferry)	Forecast	Actual (bridge)
Motorcycles	3,600	3,120 (-13%)	4,580	10,610 (+132%)
Other vehicles	5,370	3,410 (-36%)	6,770	9,480 (+40%)
Vehicle Occupants	46,360	35,290	64,730	86,770 (+34%)

Source: Elaborated by the study team, based on the AusAID [2003a], p.22, Table 3.4 and AusAID [2003b], p.35, Table 3.13.

Passenger and Freight Movement to/from HCMC 1999 and 2002

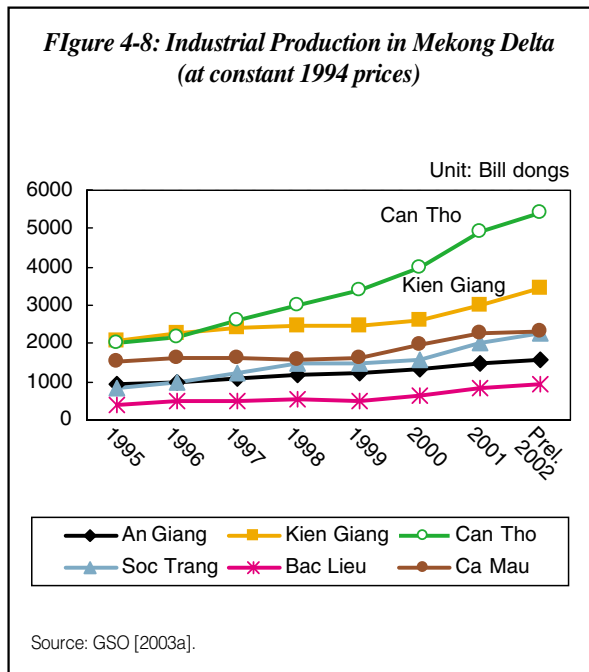


Note: The two traffic surveys are not precisely comparable due to methodological differences.

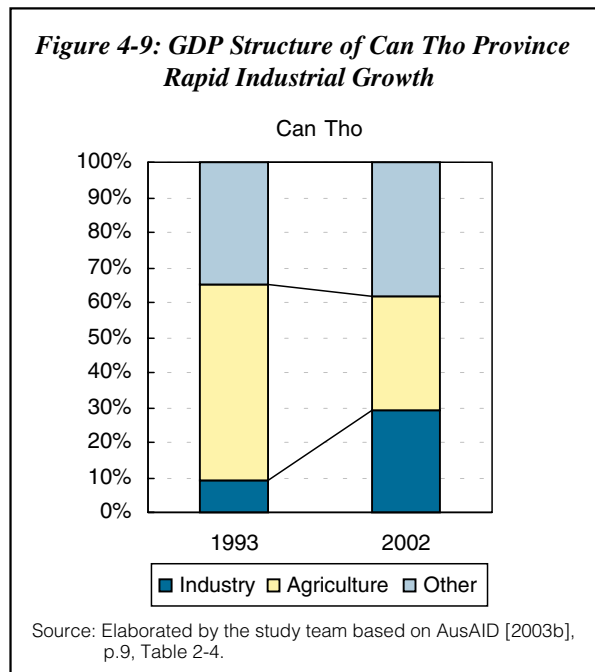
Source: Database from VITRANSS [1999] and HOUTRANS [2002], established under JICA-supported Study on the National Transport Development Strategy in the Socialist Republic of Vietnam and Study on the Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area.

The pattern and nature of investment attraction in Can Tho is distinct from that observed in the northern transport corridor. In Can Tho, industrialization is natural resources-based, linked with the local economy (e.g., agriculture and fishery production). There are many Vietnamese enterprises engaged in food processing manufacturing in industrial zones. In fact, provinces in the Mekong Delta appear to be growing by taking advantage of their respective resource potentials. As the latest VHLSS 2002 shows, the Mekong Delta has achieved major poverty reduction and growth in per capita income (particularly agriculture and fishery income) during 1998-2002. Although this cannot be attributed solely to the Bridge and NH1, it is fair to say that the two large-scale infrastructure projects, have at least accelerated poverty-reducing growth in this region.

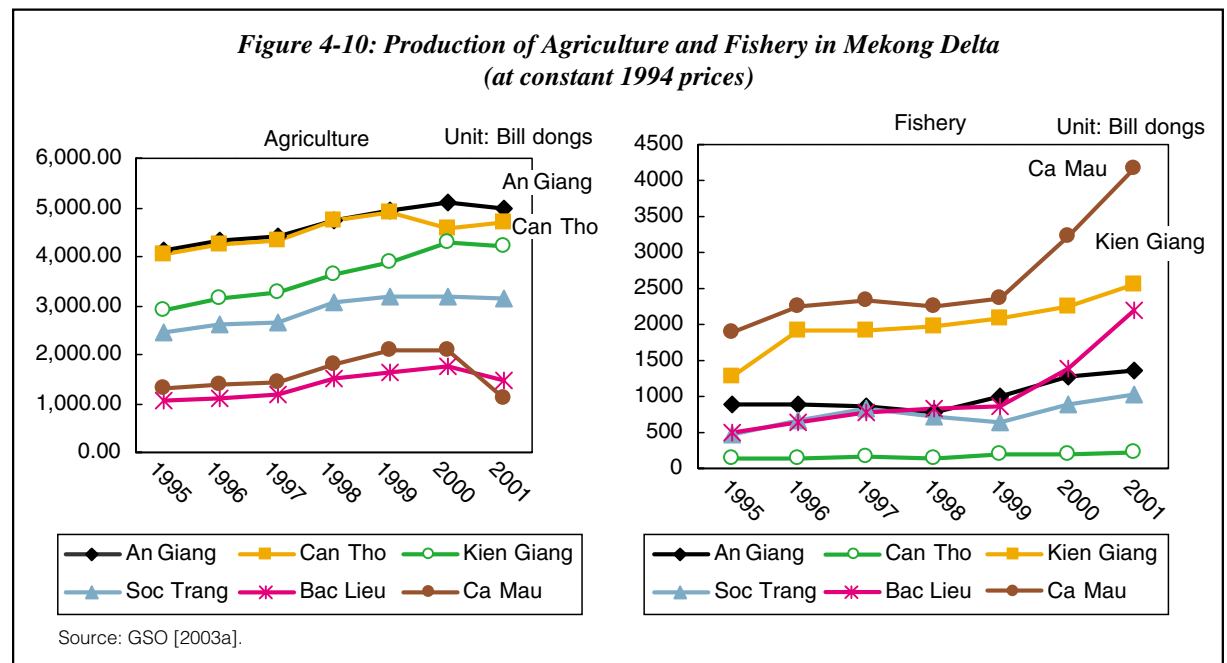
**Figure 4-8: Industrial Production in Mekong Delta (at constant 1994 prices)**

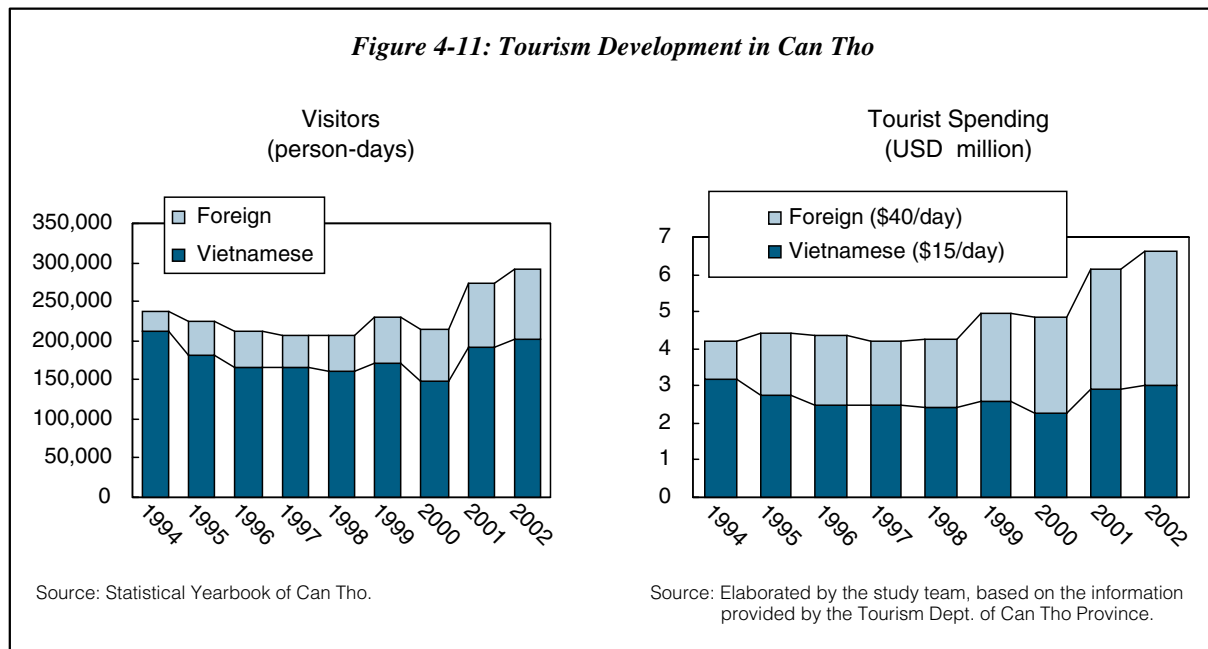


**Figure 4-9: GDP Structure of Can Tho Province Rapid Industrial Growth**



**Figure 4-10: Production of Agriculture and Fishery in Mekong Delta (at constant 1994 prices)**





**(3) North-South 500kv Transmission Line—achieving system stability, sustaining high economic growth and improving living standards in the latter half of the 1990s.**

The North-South 500kv Transmission Line was completed in 1994. By transferring low-cost, surplus electricity generated by the Hoa Binh hydropower plant, it has contributed to mitigating power shortages in the central region and the fast-growing south (which often had to rely on costly diesel-fired generation). After its operation began in 1994, the demand for electricity in the south and central region jumped about 20%. For example, when the Vietnamese economy recorded dynamic growth in 1996-97 at 8.8% in real terms (particularly with the south growing at 9.2%), the electricity transferred from the north supported about 20% in the south and about three-fourth of the electricity demand for the central region (to satisfy the demand of industrial, residential, and service or other sectors). The transfer of electricity from the north to the south had continued until 1999-2000 when large-scale exploitation of natural gas potential began in the south, and when the capacity of thermal power plants such as Phu My and Ba Ria expanded in the late 1990s, by utilizing offshore natural gas.

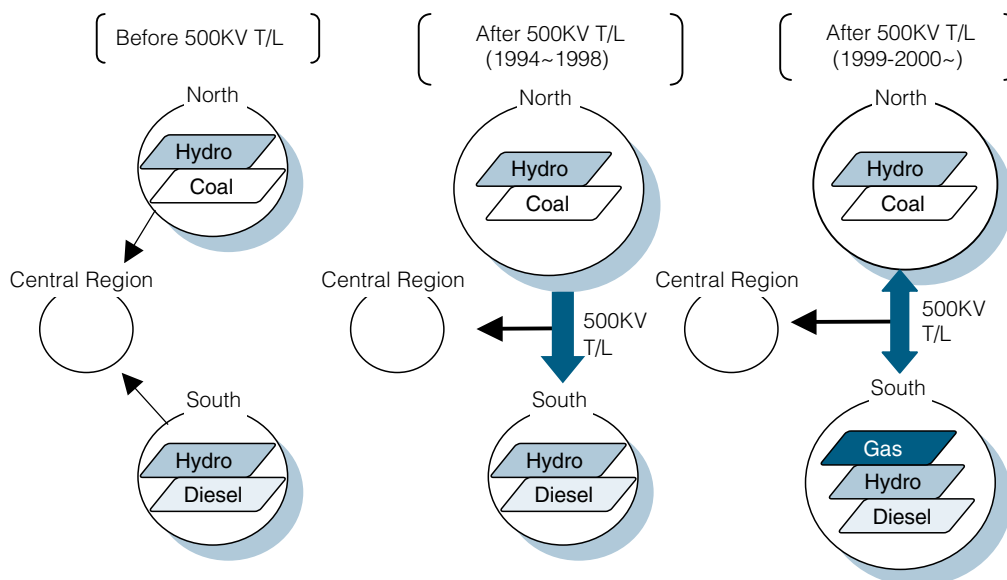
Particularly in the south, electricity transfer through the 500kv Transmission Line and the subsequent increase in the power generation capacity of the region allowed rapid expansion of the electricity network [see Map for electricity network improvement (p.29)]. Thanks to this network expansion, power supply conditions have significantly improved, bringing substantial benefits to firm production and rural electrification. In fact, firms in HCMC and its vicinity report major improvements in power conditions, including the achievement of substantial elimination of blackouts (since 2000) and more stable and cheaper supply of electricity to firms. The latest VHLSS 2002 data also confirm important progress in rural electrification in the south. During 1998-2002, among the lowest income group, the ratio of households using electricity increased from 54% to 72%.

At present, the 500kv Transmission Line provides system stability and shifts electricity between regions at peak times. Future investments should take account of cost factors (for transferring bulk power between regions) and be made in the overall plan so that generation capacity in the north and the south could roughly balance and satisfy the projected demand in each region.

**Box 4-6: North-South 500kv Transmission Line**

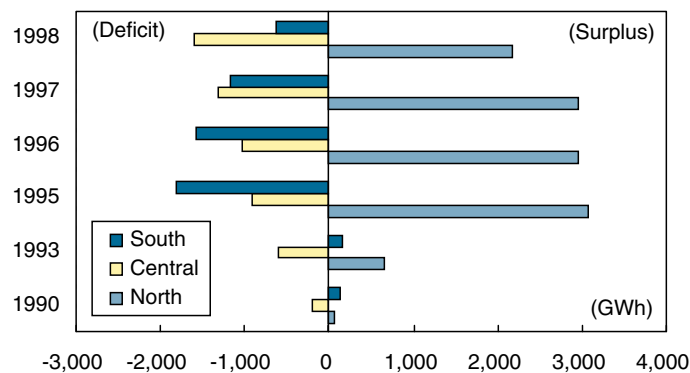
Before the construction of the 500kv Transmission Line, the north and the south had autonomous power systems, and both regions transferred a small portion of generated electricity to the central region. But, these systems could not afford the rising demand of electricity, which corresponded to Vietnam's rapid economic growth starting in 1992. The development and supply of new power generation were urgently needed. The government decided to expand the Hoa Binh hydropower plant in the north, with total capacity of 1,920MW (completed in April 1994) and constructed the North-South 500kv Transmission Line, which connects the north, central and southern regions.

**Electricity Transfer between the North, the Central Region and the South via the 500kv Transmission Line**



Source: Prepared by the study team based on the information from Electricity of Vietnam (EVN).

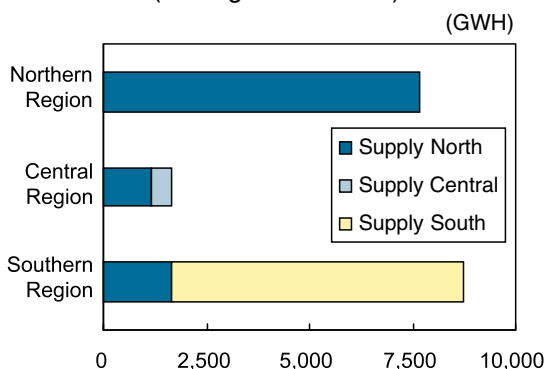
**Demand and Supply Balance of Electricity by Region (1990-98)**



Source: Elaborated by the study team based on JBIC [2000], p.3-2, Table3.1.2.

**Box 4-7: Sustaining High Growth and Improving Livelihood  
The Contribution of Transferred Electricity**

Regional Electricity Demand and Source  
(average of 1996-97)



Annual Demand Growth of Electricity

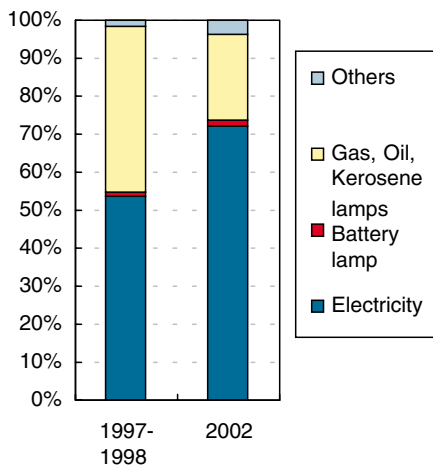
	1992	1993	1994	1995	1996	1997
North	5.4	6.8	12.1	16.0	14.0	12.8
Central	17.2	15.0	25.4	25.6	21.3	19.6
South	6.7	16.6	21.0	23.3	21.1	15.2
(GDP growth)	8.7	8.1	8.8	9.5	9.3	8.2

Notes: 1) The North includes: Red River Delta, North East and North West; The Central includes: North Central Coast, South Central Coast and Central Highlands; and The South includes: North East South and Mekong River Delta.  
2) Demand is shown in terms of the total electricity demand required for region. Supply is shown in terms of electricity generated in (and transferred to) the region.  
3) The data include loss factors.

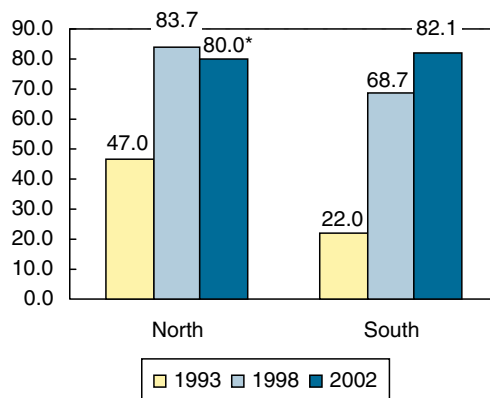
Source: Prepared by the study team based on World Bank [1998], Annex 1.19-1.23 and Volume II, Annex pp.20, 23-24.

**Box 4-8: Increased Access to Electricity through Network Expansion**

Source of Lightening among  
Lowest Income Group



Households Using Electricity as a Source of  
Lightening by Region



Source: Elaborated by the study team, based on GSO [2000], p.372 and GSO[2003b], p.4.

Notes: \* The decline from 1998 to 2000 in the North is attributed to the change in regional classification. North Mountain Mid Land [GSO 2000] is divided into Northeast and Northwest [GSO 2003b]. The 1993 data are quoted from the World Bank [1998], p.112. The 1998 and 2002 data are calculated from GSO [2000], p.372 and GSO [2003b], p.4 respectively.

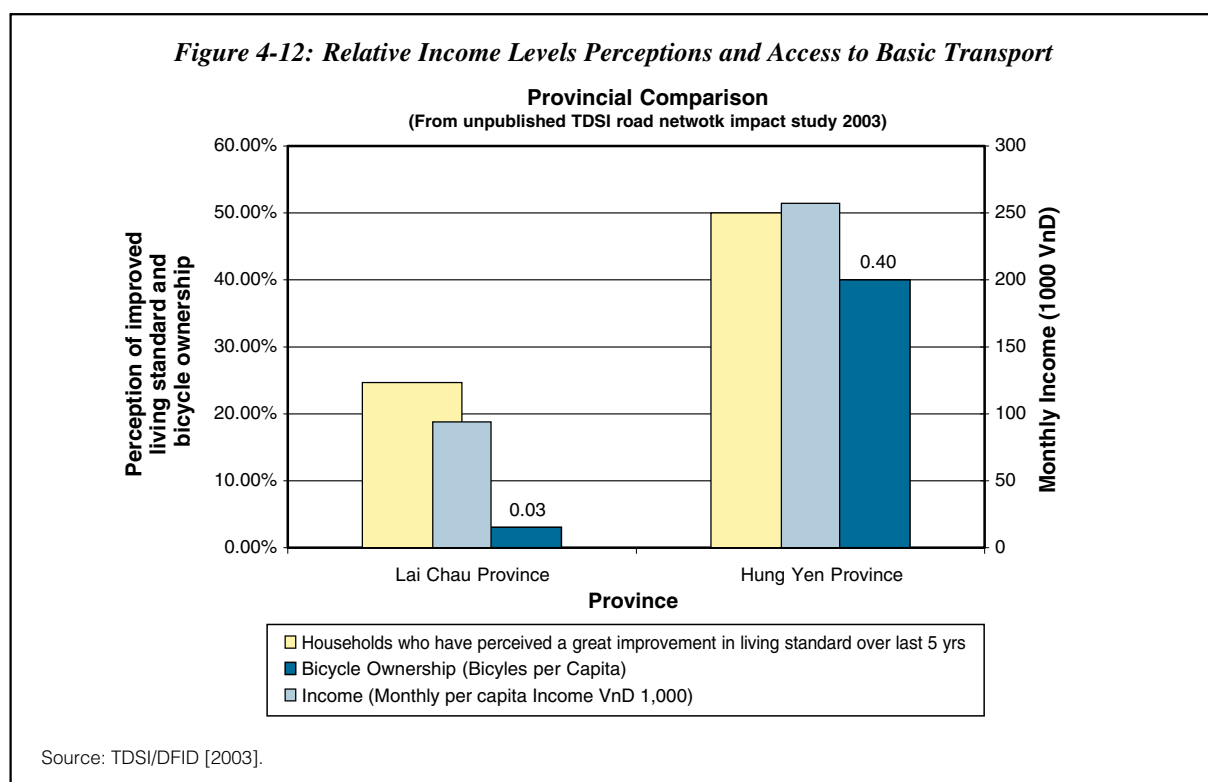
Source: Elaborated by the study team, based on the World Bank [1998], p.112, GSO[2000], p.372 and GSO[2003b], p.4.

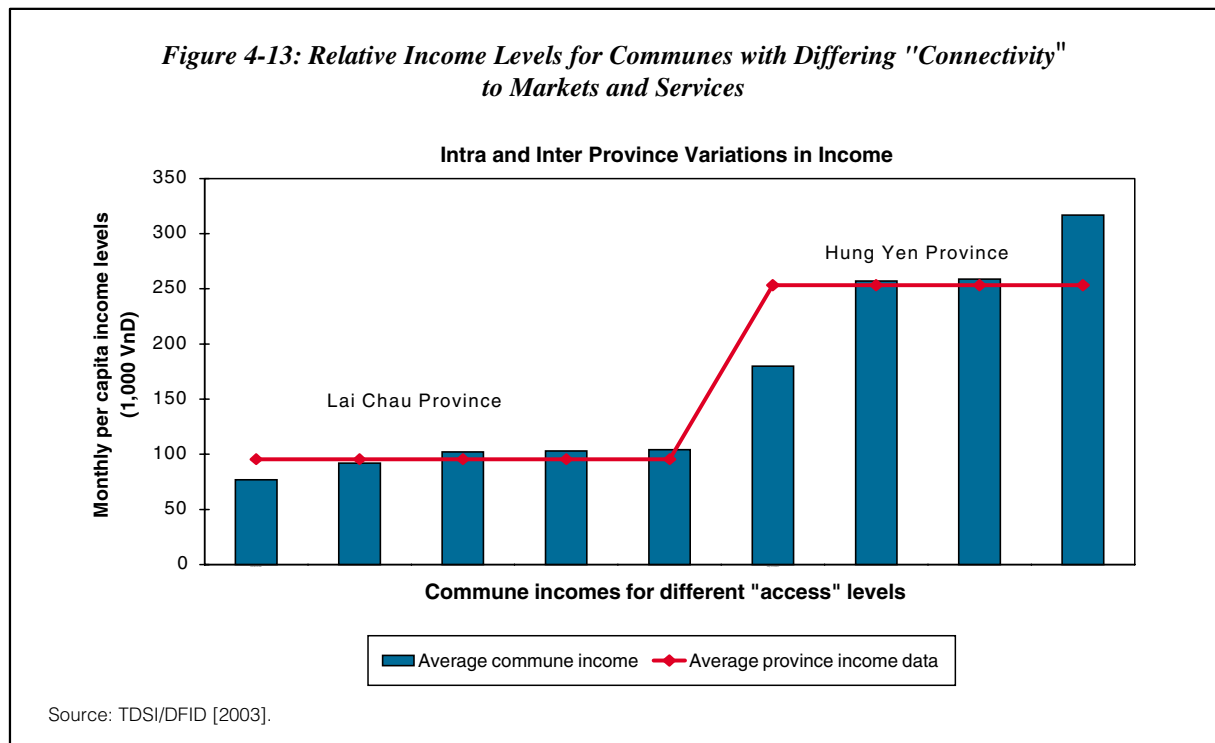
In addition, the following analyses offer complementary perspectives on the linkage effects.

**(4) Improving "connectivity" to markets—road network and accessibility in rural areas.**

A comparative analysis of Hung Yen and Lai Chau provinces confirms the usefulness of different levels of roads and their vital importance (as a road network) in connecting commune residents to markets, information, education and health services, and improving local livelihoods. Generally, local people attach high value to commune roads because they provide key links to opportunities—through their connection to national, provincial, and district roads. At the same time, the analysis reveals inter-and intra-provincial variations in income and resource-mobilization ability. "Economic distance" and "connectivity" to markets and services are key determinants for such variations, along with the availability of productive assets.

Road development has had critical impacts in Hung Yen, in terms of both social and economic benefits. Situated close to Hanoi and NH5 to Hai Phong Port, the rural population of Hung Yen has benefited substantially from the growth of the region. Lai Chau has also benefited from improved road network, but the province is less able to take full advantage of the opportunities that improved road access can bring. This is partly because Lai Chau is located in the remote Northwest of Vietnam and still lacks basic infrastructure services and access to markets. Furthermore, Hung Yen has greater ability to mobilize resources for infrastructure development (e.g., from commune budgets and the people's contributions) than Lai Chau which primarily depends on the central government budget for rural transport investment. Benefits are not equitably distributed within communes either, with the better-off households more likely to capture the opportunities to increase their income. All these remind that there are certain disadvantaged groups (or the "chronic" poor) which are less likely to participate in the recent broad-based growth.





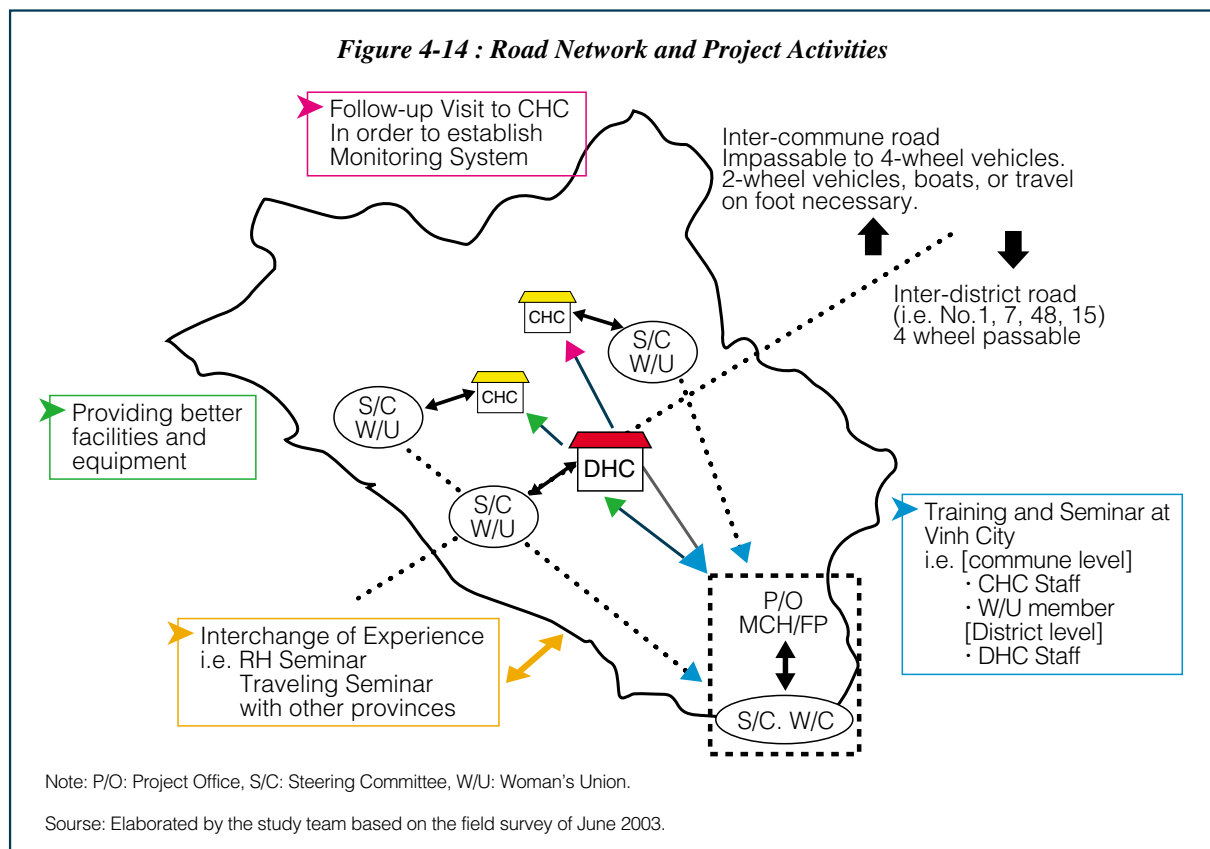
**(5) Improving user access to social services—through the strengthened function of road network.**

Trunk roads constitute an indispensable part of the road network, together with rural roads improving user access to social services. There are several factors that critically determine user access to social services. These include ensuring physical access, improving the quality of social service delivery, and providing education for users (changing people's awareness of social service needs), etc. In particular, the latter two require the effective implementation of national and/or regional programs based on community participation. The role of the road network—particularly the contribution of large-scale infrastructure—in improving social service delivery should be understood within this broad context.

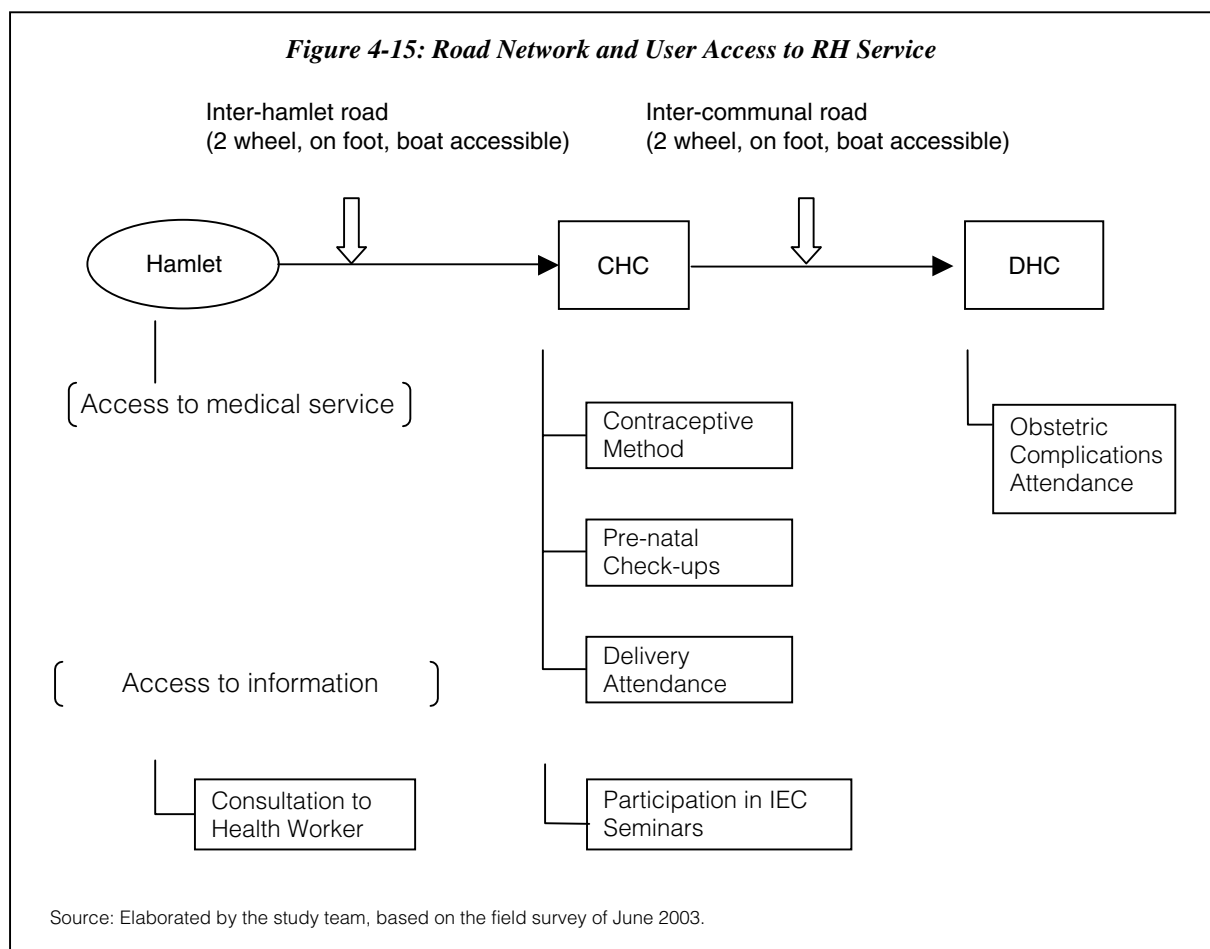
The experience of the Reproductive Health Project (ongoing) in Nghe An province<sup>5</sup> suggests the complementary nature of different levels of roads to improve the provision of (or access to) information and services, from the viewpoint of both service providers and users. Well-servicing trunk roads and inter-commune roads (connecting district capitals and commune centers) facilitate communication and knowledge sharing among health workers, project staff and stakeholders, and thus are indispensable for service providers and project staff engaging in regional (or even national) health care programs. Inter-commune roads and inter-hamlet roads are essential to providing core services to commune residents, services such as basic health care (e.g., contraceptive method, pre-natal check-ups, delivery attendance at community health centers) and access to information, for example, through IEC (Information, Education and Communication) seminars and consultation with health workers.

<sup>5</sup> This JICA-supported project started in 1997 under collaboration with Japanese NGO, JOICFP. The project aims at improving the RH services in Nghe An province—which is one of the poorest provinces and lacks well-trained midwives at the commune level. In phase II (covering 2000-2005), the project has extended coverage to all 469 communes (in 19 districts) and gives greater attention to: (i) capacity building of community-based voluntary organizations and District Health Centers (DHCs); (ii) strengthening of links with family planning-related activities such as training of health workers in post-abortion counseling skills; and (iii) establishment of the Health Management Information System.

**Figure 4-14 : Road Network and Project Activities**



**Figure 4-15: Road Network and User Access to RH Service**





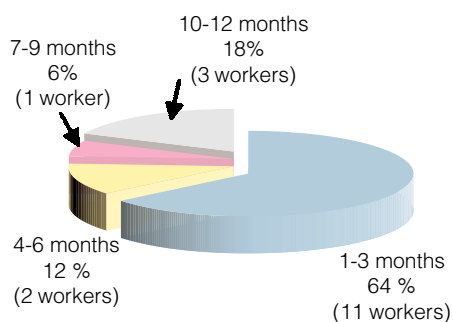
**(6) Creating effective demand for highway construction—off-farm job and income opportunities.**

In the construction of highways, a number of simple works can be carried out economically by locally-recruited manual labor (e.g., route clearance, earth digging and piling, manual transporting of materials, making road tallies, planting and maintaining grass). The employment of local farmers for such unskilled works contributes to job and income generation in the surrounding rural areas, particularly during off-farm seasons.

The ongoing improvement of NH 18 covers approximately 129km between the Noi Bai International Airport (in Soc Son district, Hanoi city) and Cua Ong town (Quang Ninh province), including the construction of the Pha Lai Bridge. The construction works commenced in October 1999 and have been largely completed, with exception of the Noi Bai-Bac Ninh section. According to estimates by the Project Management Unit, the works have so far involved 3,650 unskilled workers (31 days per assignment), in addition to 2,934 skilled workers (normally, fixed-term assignment for the average period of 667 days). Most of the unskilled workers have been engaged in the NH18 works for 24 months or longer, implying that many work repeatedly. A recent interview survey with unskilled workers at the construction site (Noi Bai-Bac Ninh section) also confirms that: (i) off-farm activities are an important source of their family incomes (on average, accounting for 68% of annual cash incomes of their households); (ii) income from the NH18 construction works occupies significant part of their family incomes; and (iii) thanks to the beginning of NH 18 construction, off-farm job and income opportunities have greatly increased. These rural households use the resulting additional income for routine expenses, education, family savings, etc.

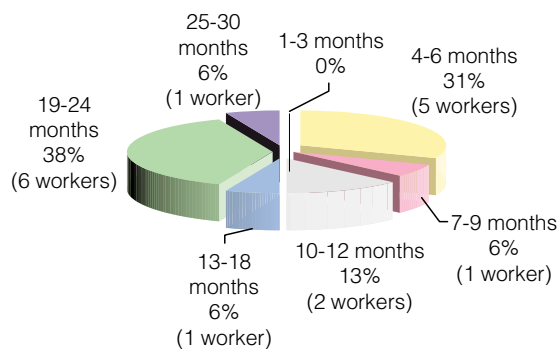
**Box 4-9: Job and Income Generation by Highway Construction (unskilled workers)**

Number of Months Working Off-Farm (2 years ago)



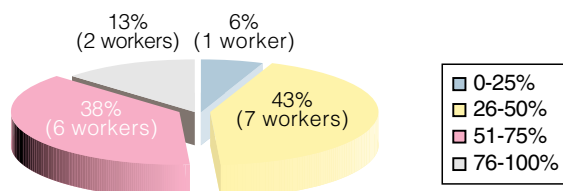
Note: Response was obtained from 17 unskilled workers.

Number of Months Working on NH18 Construction



Note: The construction of the Noi Bai-Bac Ninh section started in January 2001. Response was obtained from 16 unskilled workers.

**Contribution of NH18 Seasonal Income to Family Monthly Income**



Note: Response was obtained from 16 unskilled workers.

Source: CONCETTI [2003b].

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### *Cross-cutting Issues*

In most cases, the initial impacts of large-scale infrastructure are not necessarily on the poorest segments of the population (except for social service delivery in (5) above). Many of those employed at FDI factories and hotels are graduates of upper secondary schools or higher. But, given the fact that the majority of the Vietnamese population is clustered around the poverty line, it is important to increase wages and disposable income because this would reduce their vulnerability to risks and raise their purchasing power. This, in turn, would stimulate consumption demand for a variety of goods, including those produced by the poor (through the multiplier effect), and create new markets for agricultural products, industrial products, and services. In fact, the case analyses suggest that such a "virtuous cycle" of broad-based growth is emerging in the provinces along the northern transport corridor and in the Mekong Delta region.

The analyses of the regional economy activation effect also confirm a vital role of trunk infrastructure in promoting income diversification and off-farm employment. Infrastructure network (both large and small, trunk and rural) is a key determinant for "economic distance" and "connectivity" to markets and serves as a pre-condition for realizing poverty-reducing growth in rural areas. This is so particularly in the context of Vietnam, where the majority of the population belongs to the "transient" poor (people below and just above the poverty line) and the creation of income "opportunities" through "trickle-down" effects appears to be effective.

Moreover, it is important to connect remote areas with power grids, and trunk roads with feeder roads to achieve poverty-reducing growth. Greater attention should be given to the synergy of networking between large and small, trunk and rural infrastructure. To maximize the gains of each level of infrastructure requires a planned approach that adequately invests in both areas and ensures "connectivity." One way of seeking balanced investment decisions (between growth and poverty reduction) might be to incorporate a "network" perspective into investment planning and prioritization.

But, the physical improvement of infrastructure alone is not enough. Case studies suggest the importance of complementary policies and measures to realize and spread the benefits of large-scale infrastructure, such as the enabling investment climate, agricultural policies to promote diversification and research and extension, and deregulation of transport and distribution services.

Case studies have also found potentially negative externalities associated with large-scale infrastructure. In particular, road safety is becoming an emerging social problem. Improved infrastructure, rapid motorization, and increasing traffic densities (largely motorcycle user) are all contributing to a high level of road-related fatalities. Regarding resettlement, experience shows that if properly handled, affected families (e.g., by relocation) could sufficiently enjoy the benefits of development of large-scale infrastructure. But, the implementation of resettlement and land acquisition has turned out to be often time-consuming, affecting the progress of construction work. Since the poor are more likely to be vulnerable to adverse consequences, it is important to strengthen capacity of government agencies responsible for social and environmental monitoring so that proper safeguards can be taken throughout the planning, construction, and operation of projects.

## 5. Future Role of Large-Scale Infrastructure and Aid Partnership in Vietnam

### *Vietnam's Development Challenges and the Role of Infrastructure*

As Vietnam continues to make progress in poverty-reducing growth, it must fine-tune its development strategy to respond to new challenges. Infrastructure should be treated as an integral part of overall development strategy and attention should be paid to its complementarity with other policies. The government must play a leading role in articulating a development vision and clarifying the role of large-scale infrastructure in it.

The future role of large-scale infrastructure must be considered in light of the following development challenges.

- (1) Enhancing competitiveness in the globalized economy
- (2) Promoting rural development, particularly by creating off-farm employment
- (3) Strengthening the effectiveness of poverty-targeted measures.

To fully exploit its potential for labor-intensive export manufacturing, efforts must be geared to raising productivity and international competitiveness. This is so particularly as Vietnam's international integration is proceeding very rapidly (with USBTA, AFTA and WTO accession). As the existing surveys show, despite major improvements, investors perceive Vietnam's infrastructure conditions—both physical and qualitative—to be insufficient compared to those of its East Asian neighbors. Since efficient infrastructure is a key element of trade logistics and facilitation, continued progress in this area is indispensable. At the same time, there are other investment bottlenecks such as difficulty in procuring local parts, problems with business practices and inconsistent FDI policies. Thus, it is necessary to take an integral approach to improve the investment climate and treat infrastructure as part of a national strategy to strengthen industrial competitiveness.

**Table 5-1: Assessment of Competitiveness in terms of Specific Factors Impacting FDI**

Specific characteristics	Vietnam	China	Thailand	Malaysia	Philippines
FDI Confidence index	2	4	3	3	2
Potential economic growth	3	4	2	2	
Quality of infrastructure	1	2	4	4	2
Legal system (development, transparency, instability)	2	2	4	4	3
Tax system (development, transparency, instability)	2	2	3	3	2
Political & Social stability	4	3	3	3	2
Foreign exchange rate control and stability	2	3	2	2	2
Procurement of parts	1	3	3	3	2
Potential market access	2	3	3	3	2
Ease of doing business	1	2	3	3	2
Corruption perception	1	1	2	2	2

Note: Rankings are based on Price Water House Cooper's calculations (Rank: 4 = most competitive, 1 = least competitive). The calculation is made on the review of existing studies.

Source: MPI/JICA [2003].

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Moreover, to sustain gains in poverty reduction, Vietnam needs to make greater efforts in stimulating off-farm employment and urban employment growth, creating "economic opportunities" for the majority of the population. Here, rural infrastructure (e.g., roads, irrigation, electricity) can make direct contributions to improving the productivity of rural households, and large-scale infrastructure (such as trunk roads) can complement this by helping provide linkage to markets. Nevertheless, this should not mask the fact that there exist certain groups (or the "chronic" poor) severely constrained from participating in new economic opportunities. To ensure wider benefits and broad-based growth, it is important for the government and other agencies to design the effective poverty-targeting programs.

The three channels for pro-poor growth will be of differing importance to the "chronic" poor in the remote areas and the "transient" poor in the better-off areas<sup>6</sup>. The "chronic" poor are unlikely to benefit from economic growth directly. Consequently direct interventions aimed at improving local economic opportunities (transfer of agricultural technology, rural roads, etc.) are the most appropriate to help achieve equitable growth. In addition, social safety net or "policy" channel interventions should also be adopted (e.g., subsidies, fiscal transfer, etc.) to redistribute the gains from growth in the wider economy to poorer areas so that basic services are securely provided.

In the better-off areas (where there are large numbers of the "transient" poor), interventions that enable poor households to improve their economic linkages with domestic and external markets and support for non-farm diversification are most relevant. Put another way, to enable a "trickle down" to take effect, the formal economy needs to be made accessible to the poor. This is the most likely route for bringing the most benefit to the large segment of the population who have already benefited from Vietnam's growth but now need to be assisted to make the next step from farm to non-farm, and informal to formal employment.

### ***Key Issues for Future Strategic Planning***

As this paper shows, the links and channels through which large-scale infrastructure promotes economic growth and poverty reduction have been clearly established. The perceived dichotomy between growth and poverty should be avoided because infrastructure provides a platform for both. The government needs to articulate a shared vision for the role of infrastructure, under an overall development strategy.

In this sense, it is important to strengthen the link between large-scale infrastructure investments and future strategic planning, so that development toward shared and equitable growth, environmental sustainability and macroeconomic stability will be realized. In doing so, it is necessary to ensure the provision of efficient and effective infrastructure services—through investment planning, regulation, financing, etc. On the basis of Vietnam's past experiences, three issues merit special attention.

- (1) Complementarities between infrastructure, social investment and institutions: Human capital is essential to ensure the development effectiveness of infrastructure investment (affecting the productivity of labor and firms). It is also necessary to address the potentially negative environmental and social aspects of infrastructure projects by taking proper safeguard measures throughout planning, construction, and operation of projects. Moreover, there exist institutional complementarities. There is a need to pay attention to not only physical, but also the service and management aspects (such as pricing, competition, and accessibility by the poor) of infrastructure development—because the latter affects the efficiency of infrastructure services and the distribution of benefits of improved infrastructure to the society (including the poor). Institutional reforms must be implemented in parallel.

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<sup>6</sup> The broad categorization of the chronic and transient poor is by no means definitive. There are varying levels of types and periodicities of poverty defined by a number of factors, such as access to opportunities and vulnerability.

(2) Spatial dimension of infrastructure development: To ensure rapid but equitable economic growth, there is a need for continued efforts in developing and deepening linkages between growth centers and adjoining rural areas—so that benefits of growth are widely spread. Consequently, it is essential to ensure that the areas in which there is a concentration of poor people located near the "growth centers" are well connected to these markets and non-farm opportunities, if the "economic growth and trickle down" channel is to be effective for the "transient" poor. This implies the importance of incorporating the spatial dimension into development vision in a pro-active manner. It also requires strategic planning and better coordination of infrastructure investments at the national, sub-national, and regional levels.

At the same time, in view of inter- and intra-provincial variations in the poverty situation, there is a need to: (i) address the poorer provinces funding shortfalls; and (ii) carefully design projects and programs so that the interventions can benefit the "chronic" poor living in the poorest remote areas, in an inclusive manner. Such variations also suggest a need for taking different approaches to rural road development between the areas where the "transient" poor live and where the "chronic" poor are concentrated.

(3) Policies and measures to maximize the effectiveness of infrastructure investments. In light of their significant fiscal implications, it is important to give due attention to the issues specific to sector policies and project management—particularly, selection criteria, financing, maintenance, and the regulatory framework for infrastructure investments and operations. This is essential to ensure the sustainability of investments in large-scale infrastructure. Continued capacity building efforts are necessary to promote the following measures:

- Measures to ensure appropriate resource allocation (e.g., selection and allocation procedures, recurrent financing);
- Measures to make inputs into large-scale infrastructure effective (e.g., mobilization of diverse resources, sector policies, the network effect, operations and maintenance); and
- Measures to mitigate its possible negative impacts (e.g., addressing environmental and social impacts).

In particular, it is vital to establish proper project selection criteria, so that infrastructure investment can be prioritized and planned consistently with the development vision. This point is crucial because future investment decisions on infrastructure will become more difficult, as the marginal returns to investment tend to diminish with the progress in trunk infrastructure development. Such selection criteria should take account of two aspects: (i) the infrastructure "network," i.e., how to maximize synergy effects of different levels of infrastructure; and (ii) a proper balance of economic vs. social and poverty concerns. Ideally, a system should be developed, where the proposed projects would be ranked based on the most relevant criteria and priority be given to the best-ranked investments under the budget constraints. This is far from easy task. Concerted efforts are needed to identify such criteria and establish a practical mechanism for incorporating them in the PIP process.

It is also important to pay attention to measures to promote foreign investment and mobilize private financing for infrastructure development. At the same time, in the areas where the private sector is unlikely to participate but which have significant implications for social and economic development, public funds and ODA may be utilized.

### ***Toward Enhanced Government-Donor Partnership***

Vietnam is a country where government-donor partnership (including NGOs) is active. There are many areas where the government-donor partnership can be fruitful to achieve effective and sustainable investments in large-scale infrastructure. This is so especially because complementary measures are needed to enhance the impacts of large-scale infrastructure—for example, by developing rural roads, investing in human capitals, enhancing the investment climate, and building capacity in areas of project

planning and selection, maintenance and operations, and institutional and sector policies. In addition, there are certain groups which are severely constrained from participating in the growth process. For those groups, targeted interventions are necessary, and it is important to support such poverty-targeted programs.

In this regard, aid partnership will be useful in supporting the government's efforts, with each partner playing a complementary role based on its strength(s). In doing so, it is essential that the diversity of aid modalities be recognized according to the nature and the size of specific activities. For example, in the case of investments in large-scale infrastructure, project-based management appears to be generally appropriate because these projects involve large financial resources and require careful monitoring from engineering, social, and environmental aspects, and so on. The situations can be different for targeted interventions, which are relatively small in size and can be more effectively managed on the basis of programs. The "best mix" of aid modalities should be sought, consistent with the nature and the size of interventions, under a shared development vision and strategies for promoting growth and poverty reduction.

**Box 5-1: Shared Development Vision toward Equitable Growth**

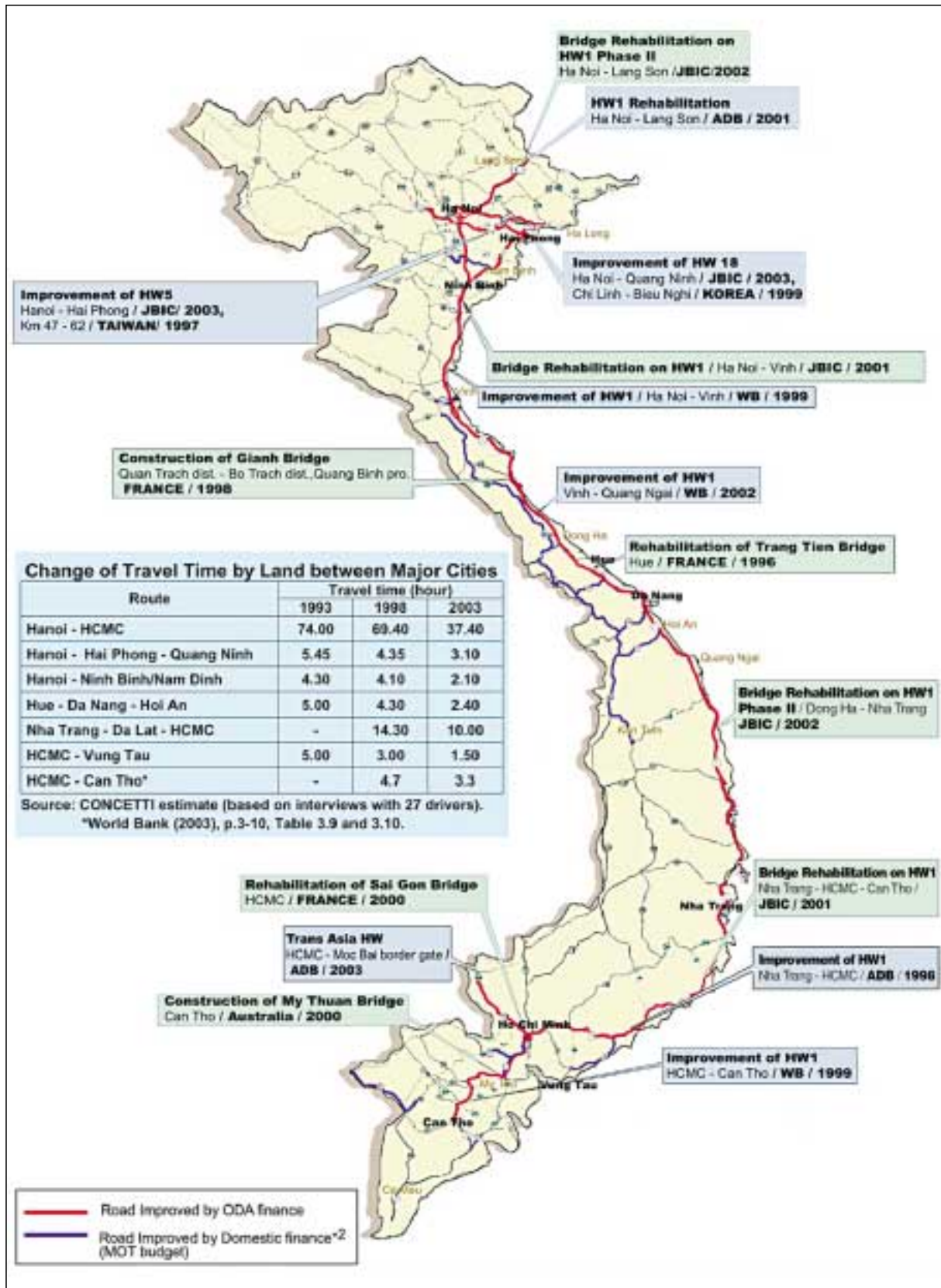
**Strategies and Policies for Promoting Growth and Poverty Reduction**

Measures Objectives	Role of large-scale infrastructure	Complementary Measures			
		Rural roads	Human capital	Targeted interventions	Policy and institutions
Growth creation	X		X		X
Growth diffusion	X	X	X		X
Direct poverty reduction		X	X	X	X

# Appendices

- **Trunk Road Network as of June 2003**
- **Electricity Network Improvement as of June 2003**

## Trunk Road Network as of June 2003\*1



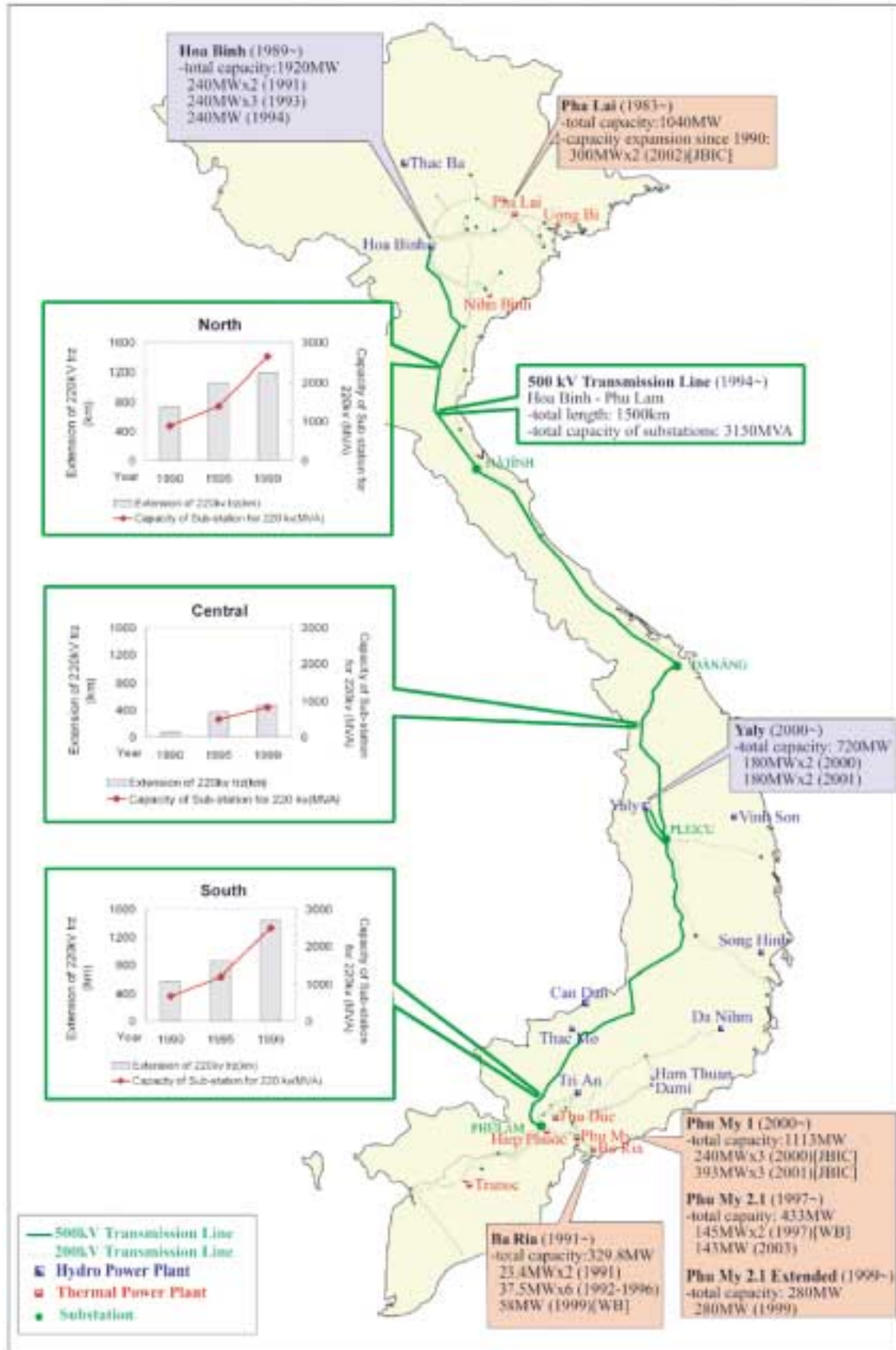
Notes: \*1 This map excludes on-going projects.

\*2 This map does not include provincial roads improved by the Provincial People's Committee's own budget.

Source: Prepared by the study team based on the data from Ministry of Transport



## Electricity Network Improvement as of June 2003



Notes: Explanation of power plant is added only for completed, large scale and currently improved power plants.

Source: Prepared by the study team based on the map and data from the Vietnam Power Development Plan 2000-2010, Prospective up to 2020, Main Body, pp.1.1-2.15. and figure 2.5 "Location Map of Existing 500-220 kv power system (Electricity of Vietnam)."

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