PART I

PRESENT SITUATION

Chapter 1 Profile of the Study Area

1.1 Natural and physical condition

1.1.1 Geography

The study area, composed of three economic regions, namely Red River Delta (9 provinces), the northeast (13 provinces) and the northwest (3 provinces), is located in northern Vietnam and has a total area of 115,751 km^2. It lies to the south of the Tropic of Cancer between latitudes 20°00' N and 21°31' N and longitudes 105°30' E and 107°00' E.

Low flat land is characteristic of Red River Delta which allows dense habitation but is vulnerable to floods. Mountainous areas in the northeast and the northwest, stretching for kilometers along Viet Nam's border provinces with China and Lao PDR, have always hampered smooth traffic and made transport development extremely costly.

Various mineral resources are mined all over the study area. Coal, mainly anthracite and half anthracite, although present in other regions, has large deposits in Quang Ninh Province, while iron ore is mainly found in Thai Nguyen. There are also oil and gas reserves for commercial use.

1.1.2 Land use

Viet Nam is very densely settled, with almost all cultivable lands in use. About 28% of land is cultivated while 35% is classified as forest and woodland. In the study area, agricultural land covers about 22,000 km^2 where paddy production dominates land use, especially in Red River Delta where it accounts for 58%.

During the long war from 1945 to 1975 large forested areas were damaged and burned. Deforestation has continued since then from agriculture clearings, forest fires and relentless collection of firewood and timber, thus substantially reducing forest cover. As of 2000, forested land in the study area was about 38,999 km^2 or 33.1% of northern Viet Nam's total area. Most of this is distributed over the northeast and northwest.

The special-use area, mostly dominated by land for infrastructure and industrial facilities, can be found in Red River Delta where more investments are given to the "development triangle" of Hanoi, Hai Phong and Quang Ninh.

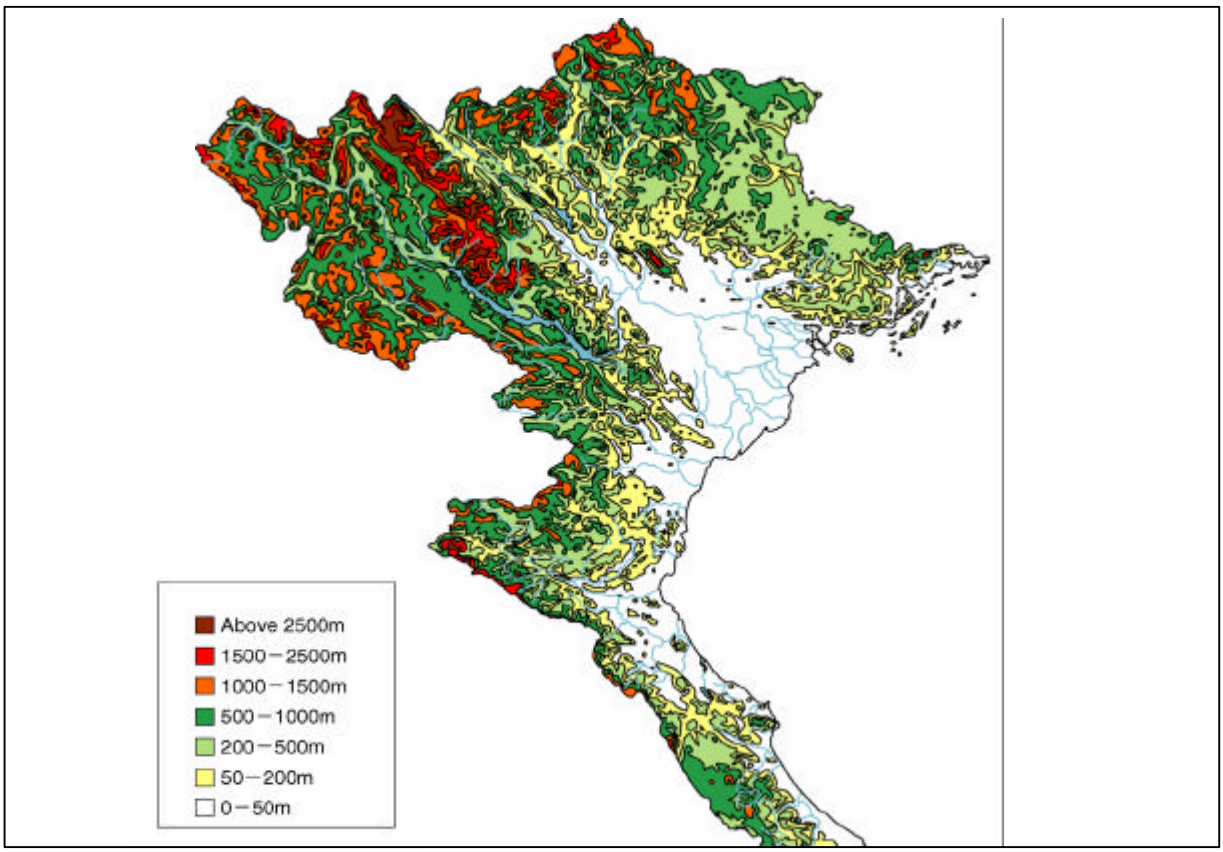


Figure 1.1.1 Topography

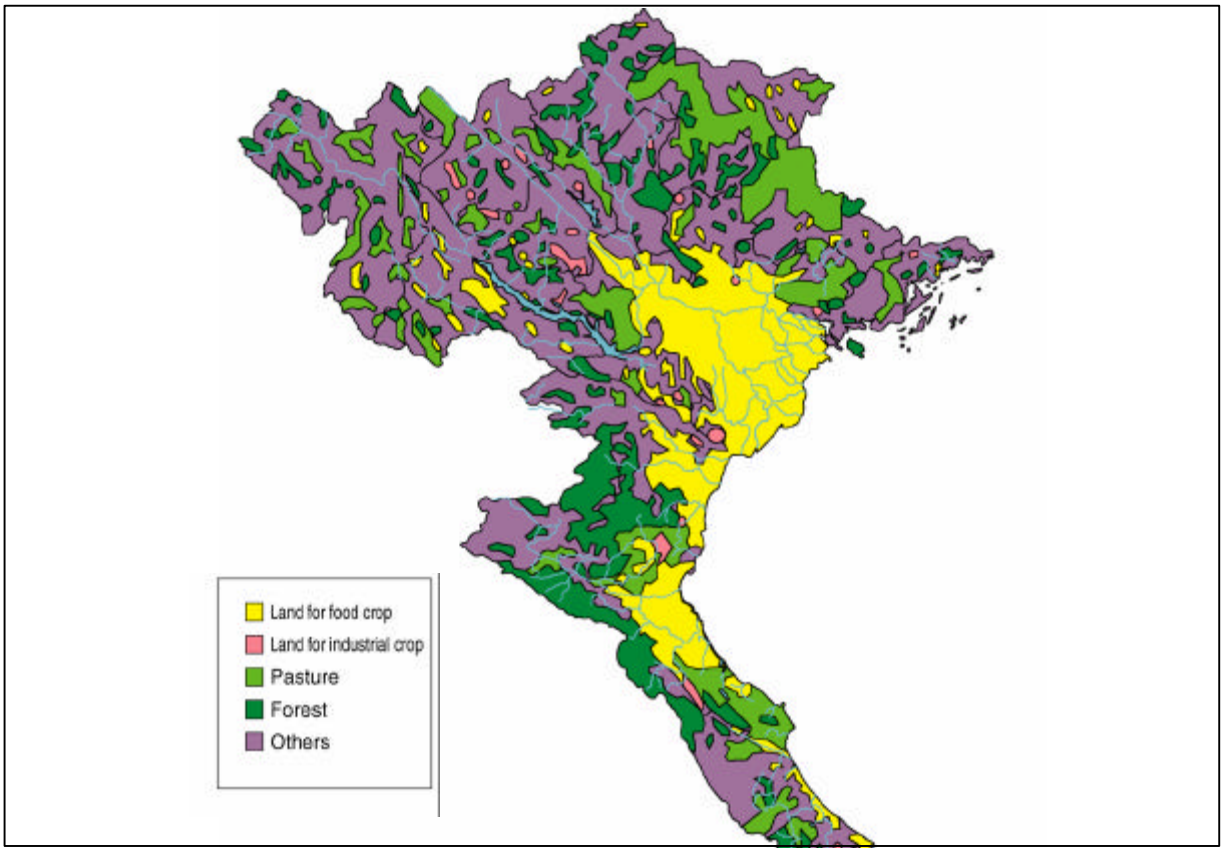


Figure 1.1.2 Present Land Use

Table 1.1.1 Present Land Use

Region	Area (km^2)	Share by Land Use (%)				
		Agricultural Area	Forested Area	Special-use Area	Residential Area	Others
Red River Delta	14,788	58.0	8.0	15.8	6.2	12.0
Northeast	65,326	13.7	40.9	3.1	0.9	41.4
Northwest	35,637	11.4	29.1	1.6	0.4	57.5
Subtotal	115,751	18.7	33.1	4.3	1.4	42.5
Viet Nam	329,241	28.4	35.2	4.6	1.3	30.5

Source): GSO, "Statistical Yearbook", 2000

1.1.3 Climate

The climate in the study area ranges from tropical to subtropical. It is subject to the monsoon winds of East Asia – the northeast (winter) monsoon that prevails from October until March or April and the southwest (summer) monsoon for the remainder of the year.

The mean annual rainfall varies from about 1,200 mm in the catchment of Da River to about 4,800 mm in the catchment of Lo River. Reflecting the cyclic movement of the main air mass from winter to summer, there is a strong variation in rainfall, with a maximum in the summer and a minimum in the winter. On the average, about 15 typhoons affect the coastal regions of Red River Delta every 10 years. High rainfall causes drainage problems and more severe typhoons cause rivers to overflow, resulting in flooding.

1.2 Socio-economic profile

1.2.1 Population

The total population of the study area is 28.2 million or 28% of the national total. Viet Nam's average annual population growth rate in the past 10 and 5 years was 1.6% and 1.5%, respectively, which was lower than that of other developing countries and much lower than its 3.4% growth rate in the 1950s. The progressive reduction in population growth rate has been the continuing effect of the Government's "two-children policy" implemented in the early 1960s.

Table 1.2.1 Populations and Its Average Annual Growth Rate

Item	Unit	Total	RRD	Northeast	Northwest
2000 Population	million	28.2	17.0	8.9	2.3
Composition	%	100	60	30	10
Population Density	persons/km^2		<1000	<200	>100
AAGR for 10 years	%	1.4	1.3	1.5	2.1
AAGR for 5 years	%	1.2	1.1	1.3	2.1

Note) AAGR - average annual growth rate

Source) GSO, "Statistical Yearbook ", 2000

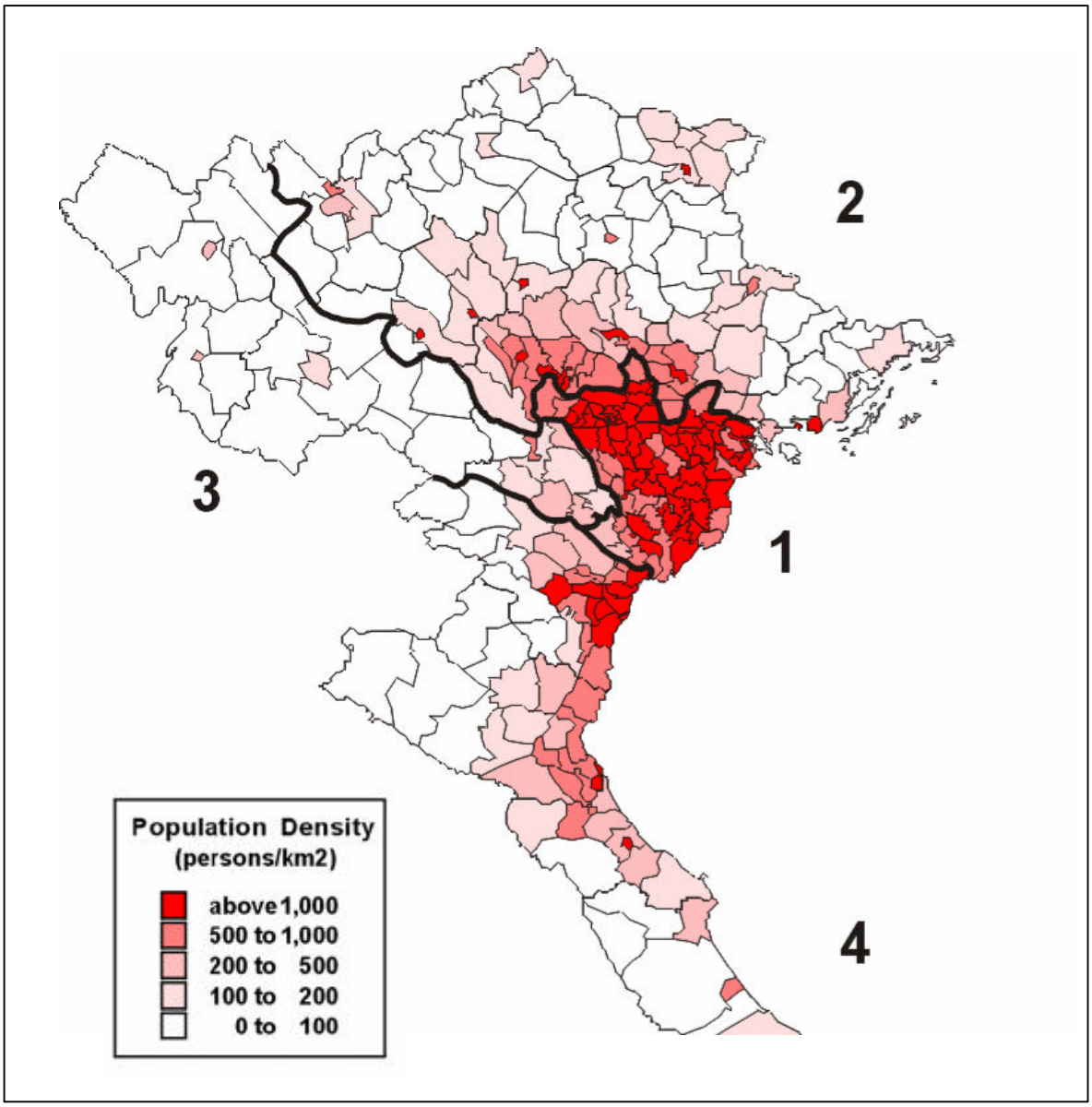


Figure 1.2.1 Population Density by District, 1996

The population growth rate in the study area, on the other hand, was 1.4% and 1.2% in the past 10 and 5 years, respectively. Among provinces, Hanoi had the highest growth rate, 2.6% for the past 10 years and 2.4% for the past 5 years.

The population share of Red River Delta, the northeast and northwest in the study area's total population is approximately 60%, 30% and 10%, respectively. The study area's population, average annual growth rate and density are summarized in **Table 1.2.1**.

1.2.2 Gross domestic product

Still one of the poorest countries in the world with a per capita gross domestic product (GDP) of about US$ 300, Viet Nam is at the beginning of a long transition to a market economy. The average annual growth rate of GDP in the period 1991-1997 was over 8% due mainly to the rapidly expanding industrial sector. However, the 1997 financial crisis has affected Viet Nam's economy, resulting in a slight decline in GDP growth rate since 1998.

The share of industry in the GDP has been expanding significantly and continuously, from 25% in 1990 to 35% in 2000 at an average annual rate of 3.5%. On the other hand, the share of agriculture has been decreasing, from 32% to 25% in the same period. Due to the rapid expansion of the industrial sector, the service sector's share has slightly shrunk, from 42% to 41% in 10 years.

As for regional GDP, more than 50% of the total GDP comes from northeastern south and the Mekong River Delta. Northern Viet Nam accounts for only 25%, with Red River Delta contributing the most, despite a per capita GDP of only VND 4.34 million, which is lower than the national average.

Table 1.2.2 GDP Growth Rate by Sector

(unit: %)

Item	1991-1996	1997	1998	1999
Total GDP	8.4	8.2	5.8	4.8
Agriculture	4.4	4.3	3.5	5.2
Industry	12.8	12.6	8.6	7.6
Service	9.0	7.1	4.9	2.3

Source) DSI, VITRANSS

Table 1.2.3 GDP and Its Sectoral Composition at Current Price, 1999

Region	GDP (bil. VND)	Per Capita GDP (mil. VND)	% in the Total	Share by Sector (%)		
				Agriculture	Industry	Service
Red River Delta	73,219	4.34	18.3	23.7	30.8	45.5
Northeast	22,726	2.57	5.7	38.6	26.8	34.6
Northwest	4,368	1.95	1.1	52.9	14.7	32.5
Subtotal	100,314	3.59	25.1	28.4	29.2	42.4
Viet Nam	399,942	5.22	100.0	25.4	34.5	40.1

Source) GSO, "Statistical Yearbook", 2000

Regional GDP by sector is markedly different in the study area. In Red River Delta almost half of its GDP comes from the service sector, whereas more than half of the northwest's GDP comes from the agricultural sector.

1.2.3 Employment

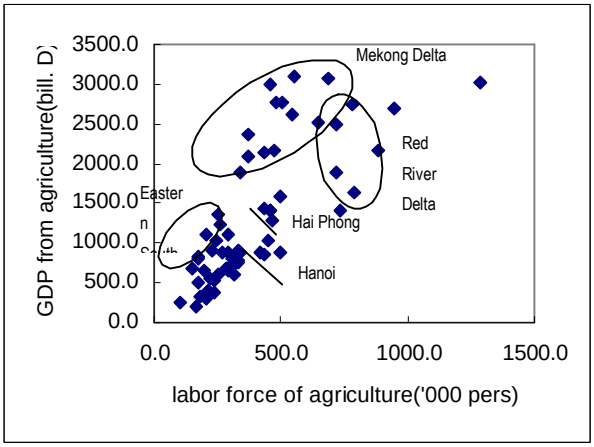
Until 1966 employment growth kept pace with labor force growth. In 1997, for the first time since Doi Moi reforms were initiated, it turned negative, ie -0.6%. Although service sector productivity remained low, more than half the labor shed by agriculture and industry was absorbed by the rural service sector and a third by the urban service sector.

Viet Nam is considered an agricultural country supported by numerous villages and farms and where all arable land is under cultivation. The composition of employment by sector reflects such character. However, a progressive change has been occurring in the number of workers by sector since the 1990s as the country marches on to industrialization: The number of workers in the secondary sector has been increasing, while that in the primary sector has been decreasing. Employment statistics by region and sector as of 1997 are shown in **Table 1.2.4**.

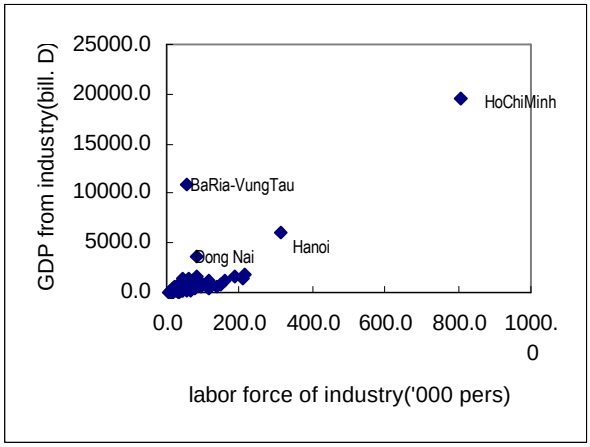
Table 1.2.4 Employment by Region and Sector, 1997

Region	Labor Force (mil.)	Share by Sector (%)			Share by Entity (%)			
		Agriculture	Industry	Service	State	Non-state	Foreign	Joint Venture
Red River Delta	6.9	65.0	10.4	24.6	7.8	91.4	0.1	0.7
Northeast	5.3	81.7	5.1	12.2	7.1	92.6	0.0	0.3
Northwest	1.0	89.3	1.5	9.2	6.2	93.7	0.0	0.1
Subtotal	13.2	73.9	7.6	18.5	7.4	92.5	0.1	0.0
Viet Nam	34.7	65.8	10.0	24.1	8.7	90.9	0.4	0.6

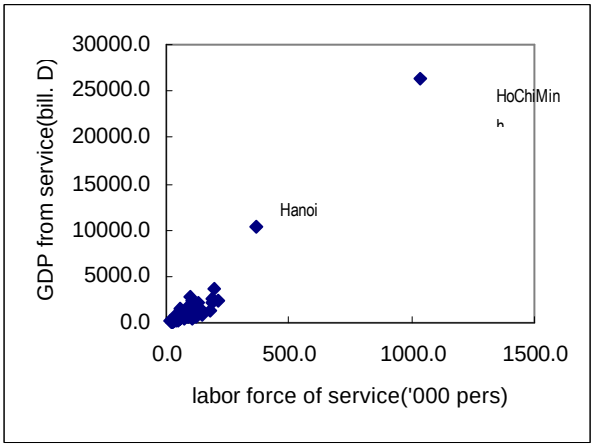
Source) GSO, "Statistical Yearbook", 1998



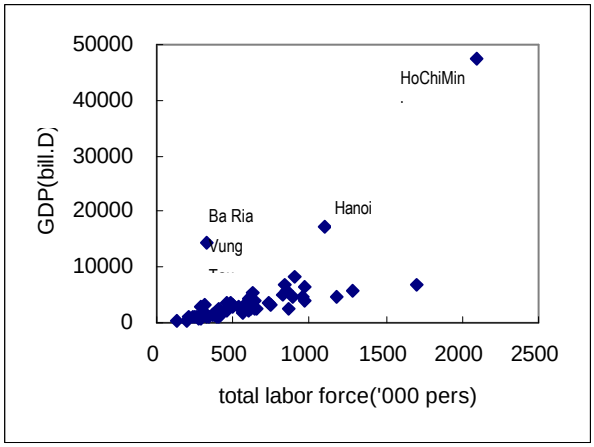
(a) Agriculture



(b) Industry



(c) Service



(d) Total

Figure 1.2.2 Relation of Labor Force and GDP

1.3 Transport network

1.3.1 Road

Roads are classified into national, provincial, district, and village according to design standard and function. There are also urban roads in main cities and large towns and special-purpose roads. Although the road network is extensive, it was designed and built over 50 years ago. With few exceptions roads have not been upgraded to meet the needs a greatly increased number of vehicles. At present, the total length of the road network in the north, comprising national, provincial and district roads, is 31,687 km almost half of which is composed of district roads. As for road condition, national roads are generally better than other roads.

Table 1.3.1 Road Network

(unit: km)

Classification	Northern Viet Nam	Viet Nam
National	6,667	14,710
Provincial	7,364	17,883
District	17,656	39,273
Total	31,687	71,866

Source) VITRANSS, 2000

1.3.2 Railway

The railway network in the north has a total length of 1,132.5 km, accounting for 36% of the total railway network. Like the road network, it was constructed over 50 years ago and has seen little investment since then. Notwithstanding the ravages of war and the lack of funds for extensive maintenance or the purchase of modern locomotives and carriage, railway services have been maintained and are being gradually improved. As with railway transport in other countries, stiff competition with road transport has resulted in a progressive decline in traffic and revenue.

1.3.3 Inland waterway

Inland waterway transport has much in common with rail transport, especially in so far as the continuing decline in both passenger and freight in terms of modal share. Despite this, the extensive network of wide and deep waterways in Red River Delta can provide an efficient means of transport, particularly of bulky cargoes, without adverse environmental impact. In fact, in other regions of Viet Nam, inland

waterways are used primarily to transport bulky cargoes, eg coal, cement, limestone, and other construction materials. In the north, however, passenger traffic has declined appreciably over the last decade. The total length of the inland waterway network in the north is 3,380 km, accounting for 42% of the total waterway network. Main ports are Hai Phong, Hanoi, Cong Cau, Son Tay, Ninh Binh, and Viet Tri.

Table 1.3.2 Inland Waterway Network

(unit: km)

Classification	Northern Viet Nam	Viet Nam
Class I	587	1,797
Class II	860	1,206
Class III	1,122.53	3,228
Class IV – VI	810	1,982
Total	3,379.53	8,013

Source) Transport Publishing House, "Viet Nam Transport Infrastructure", 2001

1.3.4 Seaport

The north's international seaborne trade is currently handled in Hai Phong, Quang Ninh, Cai Lan, and Cam Pha ports. In 2001, Hai Phong Port, being the principal port in the north, reportedly handled 8.5 million tons of cargo, while Cam Pha Port, which deals in coal only, reportedly handled around 4 million tons.

1.3.5 Airport

There are three airports in the north and these are:

- Noi Bai International Airport, 23 km northwest of Hanoi;
- Gia Lam Airport, a small, general-purpose airport for light aircraft, 5 km east of Hanoi; and,
- Cat Bi Airport for military and domestic traffic, 10 km from Hai Phong.

Of these, Noi Bai is by far the most important since it is the only terminal for international services as well as the focal point for a number of national destinations.

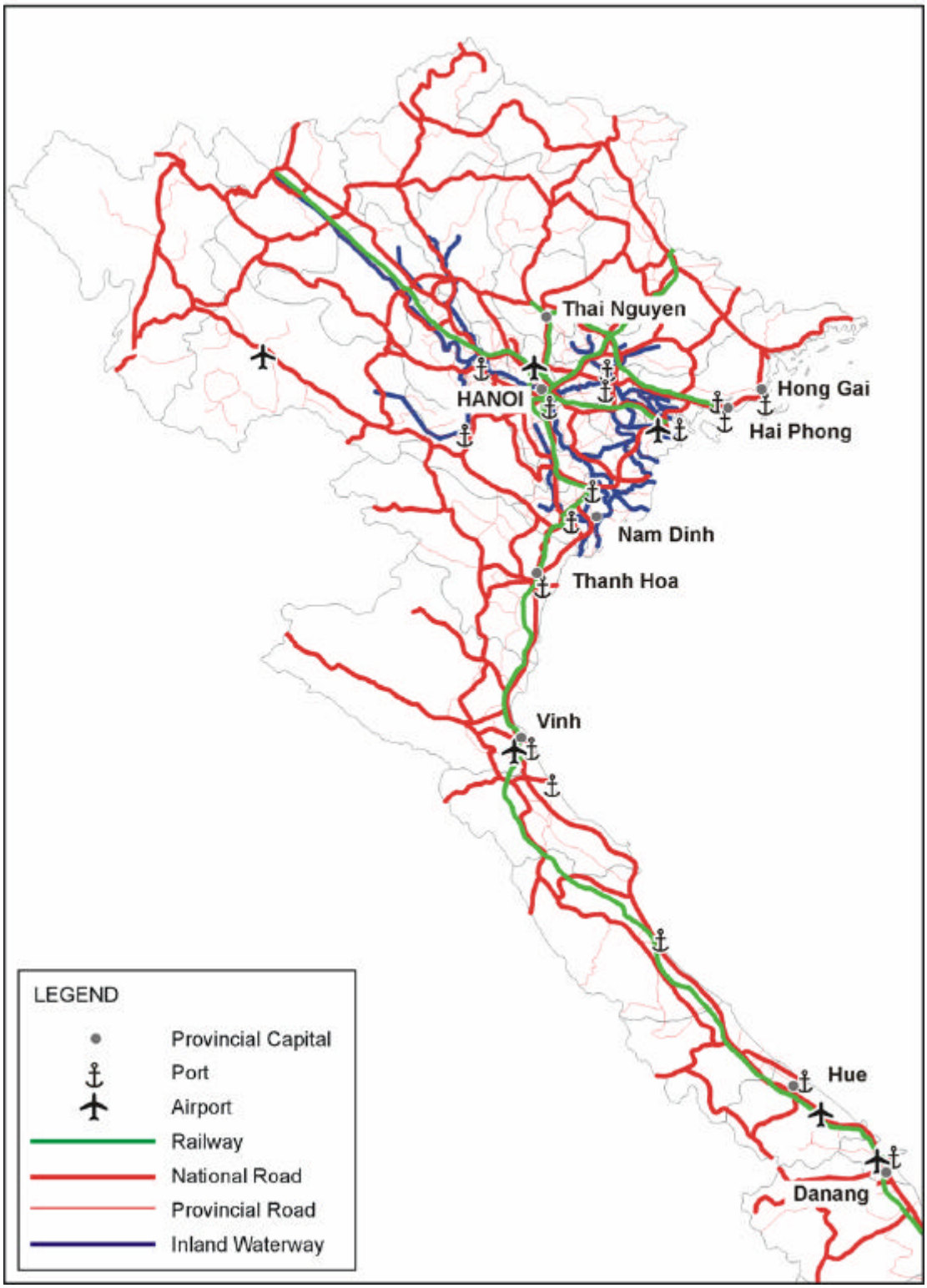


Figure 1.3.1 Transport Network

Chapter 2 Regional and Industrial Development Plan

2.1 Overview of the regional development plan

Until recently, Red River Delta existed in the early stage of the traditional economic development process. That is, the region was in the pre-industrial stage largely dependent on agriculture, with virtually its entire population producing food and goods to meet only the basic of needs. The Government controlled the resources, planned production targets and organized the distribution of inputs. In this early stage of economic development, capital investment was mainly directed to support the agricultural sector.

However, after Doi Moi was implemented Vietnam has found itself in a stage of rapid economic development. The introduction of market economy has led to a dramatic increase in agricultural production. But, more substantial increase has occurred in the industrial sector. Driving forces that have pushed the country toward industrialization are expected to progressively strengthen at least in the short or medium term. With these in mind, the Ministry of Planning and Investment (MPI), the Ministry of Science, Technology and Environment (MOSTE) and the Ministry of Information (MOI) in 1996 came up with the "Socio-economic Master Plan of the Red River Delta Region in the Period 1996-2010" which plotted the region's agricultural and industrial development. The Master Plan had the following major objectives:

- To make the Red River Delta region an economic powerhouse that will support national agriculture and industry;
- To ensure an economic growth rate 1.2-1.3 times higher than the national average;
- To produce a higher GDP by optimizing the industrial and service sectors; and,
- To increase labor productivity by 8 to 9 times until 2010.

In particular, the Master Plan aimed to achieve a regional economic growth rate of 11% in the period 1996-2000 and 14% in the period 2001-2010. To attain this goal, it strongly recommended developing an economic zone, composed of Hanoi, Hai Phong and Quang Ninh, and an industrial corridor along National Highway No. 18 and No. 5.

The required actions by each sector to achieve the Master Plan's objectives are summarized in **Table 2.1.1**.

Table 2.1.1 Major Sectoral Actions recommended in the Master Plan

Sector	Action
Agriculture	• Designate a special zone for rice and corn production to produce high-quality crops for both domestic and international markets. • Use land efficiently by producing various high-quality agricultural products; develop and enrich the ecosystem; and optimize land for industry and infrastructure. • Designate a special zone for fruits, industrial crops and flower production to increase their share in the total agricultural output. • Develop agricultural and industrial processes to modernize and industrialize rural areas. • Allot budget to improve science and technology to benefit agriculture.
Industry	• Develop the sector at a high grow rate to assist other economic sectors. • Prioritize export products. • Prioritize development of modern technology, light industry (eg garment, textile, plastics, etc.), energy, information technology, etc. • Prioritize development of the economic triangle of Hanoi, Hai Phong and Hai Duong and the industrial corridor along National Highway No. 1A, 1, 5, and 18.
Service	• Take advantage of topography to develop tourism. • Enlarge commercial network and business centers. • Promote services in tourism, communication and information, financing, banking, etc.
Infrastructure	• Develop an integrated network of road, inland waterway, railway, and air transport; improve the capacity of major seaports and airports to contribute to regional economy; and upgrade the service level of public transport especially in large cities. • Complete river and sea dyke systems to prevent flooding and develop the region's irrigation system. • Supply piped and potable water to improve living conditions and the environment. • Improve access to main industrial corridors.
Others	• Increase the quality of education and training to satisfy the needs of industrialization and modernization. • Develop health care centers and upgrade hospitals. • Improve the capacity of mass media to international standards.

2.2 Development of industrial zones

According to the Master Plan, industrial zones will be strengthened inside the economic triangle of Hanoi, Hai Phong and Quang Ninh and along National Highway No. 21A and 18. The planned industrial zones are summarized in **Table 2.2.1**.

2.2.1 Hanoi

In Hanoi, priority is given to high-tech industries and industrial plants which have little adverse environmental impacts. It includes Sai Dong, Dong Anh, Soc Son and Thang Long industrial zones. These industrial zones will deal largely with electronic, assembly, food processing, and garment and textile industries. Besides these, the Northern Thang Long industrial zone is also planned.

2.2.2 NH No. 21A

Some industrial zones are to be set up along the National Highway No. 21A, including Hoa Lac, Xuan Mai, Son Tay, Vinh Yen, and Bac Ninh. These industrial zones will deal mainly with mechanical and electronic products, as well as garments that produce little adverse environmental impacts.

2.2.3 NH No. 18

Along National Highway No. 18, there exists a potential to establish an industrial zone. Heavy industry could be located in Pha Lai industrial zone such as industries producing electric appliances and mineral products. Ha Long will also have one industrial zone, divided into two sub-industrial zones – Cai Lan and Hoanh Bo. They will have an area of 100 ha and 500 ha, respectively, processing metallurgy, construction materials, mineral products and garments.

2.2.4 Hai Phong and Hai Duong corridor

This corridor will have Vat Cach, NH No. 14, Minh Duc, Dinh Vu, and Kien An industrial zones. They will mainly deal with fish processing, manufactured goods, garments, and heavy industrial products. Small industrial zones will also be established over Red River Delta.

Table 2.2.1 Major Industrial Zones

Province	Industrial Zone	Main Industry	Area (ha)
Hanoi	North Thang Long	Electric and electronic appliances, high-quality construction materials and optical products	350
	South Thang Long	High-tech industry, electric and electronic appliances, and machineries	270
	Dong Anh	Electric and electronic appliances, construction materials, processed food, and machineries	545
	Soc Son	Electric and electronic appliances, computer parts, optical products, and precision instruments	430
	Sai Dong-Gia Lam	Electric products, packaging, machineries, and processed food	80
Hai Phong	Minh Duc-Ben Rung	Ship repair and construction materials	400
	Vat Cach-Quan Toan	Ship repair and high-tech industry	400-450
	Dinh Vu	Heavy machineries	1,200
	Road No. 14 Area	Garments, textiles, footwear, and electronic assembly	1,000
	Kien An-Trang An	Garments, footwear, soft drinks, and construction materials	200-300
Quang Ninh	Cai Lan-Hoanh Bo	Electric appliances, machineries, food and processed marine products, and tourist services	300
	Hon Gai-Bai Chay	Coal, machineries, construction materials, garments, processed food, and printing	
	Cam Pha-Duong Huy	Coal, engineering, construction materials, garments, printing, and processed food	
Ha Tay	Hoa Lac	Processed food, soft drinks, machineries, and electronic appliances	450-500
	Xuan Mai	Construction materials, cement, motor and motorbike assembly	300
Ninh Binh	Ninh Binh-Tam Diep	Construction materials, processed food and forest products, garments, and machineries	500-600

Source) "Socio-economic Master Plan of the Red River Delta Region in the Period 1996-2010" 1996.

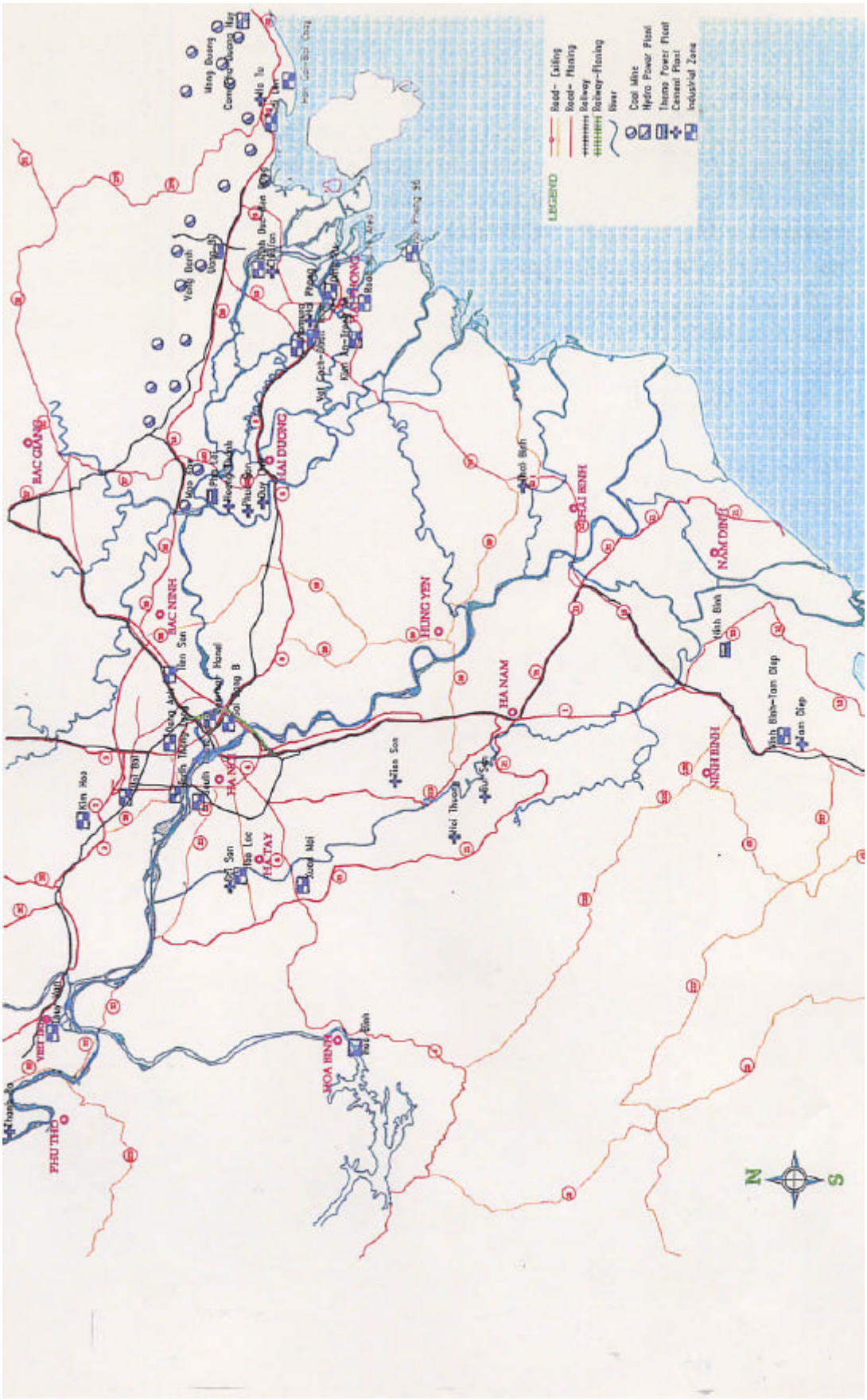


Figure 2.2.1 Major Industrial Zones and Industrial Plants

2.3 Master plan for Hanoi

In response to the dramatic changes in the socio-economic conditions in Hanoi as a result of the opening of Viet Nam's economy to market forces and the inflow of foreign investments, the Hanoi People's Committee proposed a Master Plan for Hanoi City up to 2020 with the general objective of further developing Hanoi as the national center of politics, economy, and culture. Focus was given to road network development and land-use planning to meet transport demand resulting from urbanization and industrialization. The Master Plan also proposed a new concept of urban structure together with the planned Hanoi Ring Road which is expected to provide better access to new urban development areas, industrial zones and the Noi Bai International Airport. Among the projects proposed in the Master Plan, some are currently being implemented.

As for industrial zones, the following were proposed:

- Improve the function of existing industrial zones, such as Minh Khai-Vinh Tuy, Truong Dinh-Giap Bat, Phap Van-Van Dien, Cau Buou, Thuong Dinh-Nguyen Trai, Cau Dien-Mai Dich, Chem, Gia Lam-Yen Vien, Dong Anh, and several industrial plants and craft enterprises scattered all over the city. Some measures include: (1) relocating industrial plants causing adverse environmental impact from inner city to the suburbs; (2) changing their functions according to the Master Plan; (3) limiting their expansion in terms of land acquisition; and, (4) ensuring cleaner production to improve the urban environment.
- Establish new industrial zones, eg North Thang Long and Dong Anh, and expand the capacity of existing ones such as Cau Dien, Cau Buou, Phap Van, and Duc Giang. It is expected that land for industrial use would reach about 2,000 ha.

In addition, it was recommended that industrial land should not exceed 60% of total city area. Existing and proposed industrial zones are briefly described in **Table 2.3.1**.

Table 2.3.1 Existing and Proposed Industrial Zones

Name	Industry	1997			2005		2020	
		No. of Firms	No. of Staff	Area (ha)	No. of Staff	Area (ha)	No. of Staff	Area (ha)
Thuong Dinh Industrial Zone - NH No. 6	Food processing (46%), chemical (16%), machinery (15%), leather/footwear (8.5%)	≈ 29.0	≈ 18,000.0	76.0	18,000	76.0	18,000	76.0
Minh Khai - Vinh Tuy - Mai Dong Industrial Zone	Knitting (80%), food processing (7.5%), machinery (7.5%)	17.0	≈ 17,000	81.0	1,700	81	1,700	81
Truong Dinh - Tuong Mai - Hoang Mai zone	Foodstuff (73%), machinery (26%)	≈ 13.0	4,500 - 5,000	≈ 32	5,000	32		
Van Dien - Phap Van Industrial Zone	Chemical/fertilizer (56.3%), machinery (38%), beverage	14.0	6,000	40.0	7,500	50	7,500	50
Cau Dien - Mai Dich Industrial Zone	Machinery, chemical, construction material, food processing	8.0 (incl. registered ones)	1,950	27	8,000 - 1,000	77 (+50)	8,000 - 1,000	77
Chem Industrial Zone	Construction materials (≈ 72%), knitting, basket making	5.0 (Vietnam)	2,310	15-20	2,300	20	2,300	20
Cau Buou Industrial Zone	Chemical, machinery, construction material	5	1390	4.0	11,000	54	11,000	54
Duc Giang -Gia Lam - Cau Duong - Yen Vien Industrial Zone (old industrial zone)	Machinery (≈ 38.6%), wood processing (21.8%), garment, chemical	21	10,200	38.0	16000	80 (140)	16,000	80

Name	Industry	1997			2005		2020	
		No. of Firms	No. of Staff	Area (ha)	No. of Staff	Area (ha)	No. of Staff	Area (ha)
North Thang Long industrial zone	High-technology industry: electronic parts, electronic equipment, car parts				39,000	350	39,000	350
South Thang Long Industrial Zone (high technology)	Clean industry (high technology): technology research, software, data processing, precision instruments				16,400	100	4,100	270
Sai Dong A Sai Dong B	Electronic parts Machinery, electronic equipment, automobile parts, precision instruments, beverage, pharmaceuticals, wood products, glass, plastics, etc.		55,000	24	11,000 18,000	80 150	11,000 42,000	80 350
Dong Anh Industrial Zone	Repair machinery, manufacturing machinery, automobile assembly, motorcycle assembly, electronic goods, etc.	22	8,300	70.0	25,000	150	55,000	545
Soc Son Economic Processing Zone	Electronic parts, phone, audio-visual equipment, tool manufacturing, optical products, gauge						64,000	430

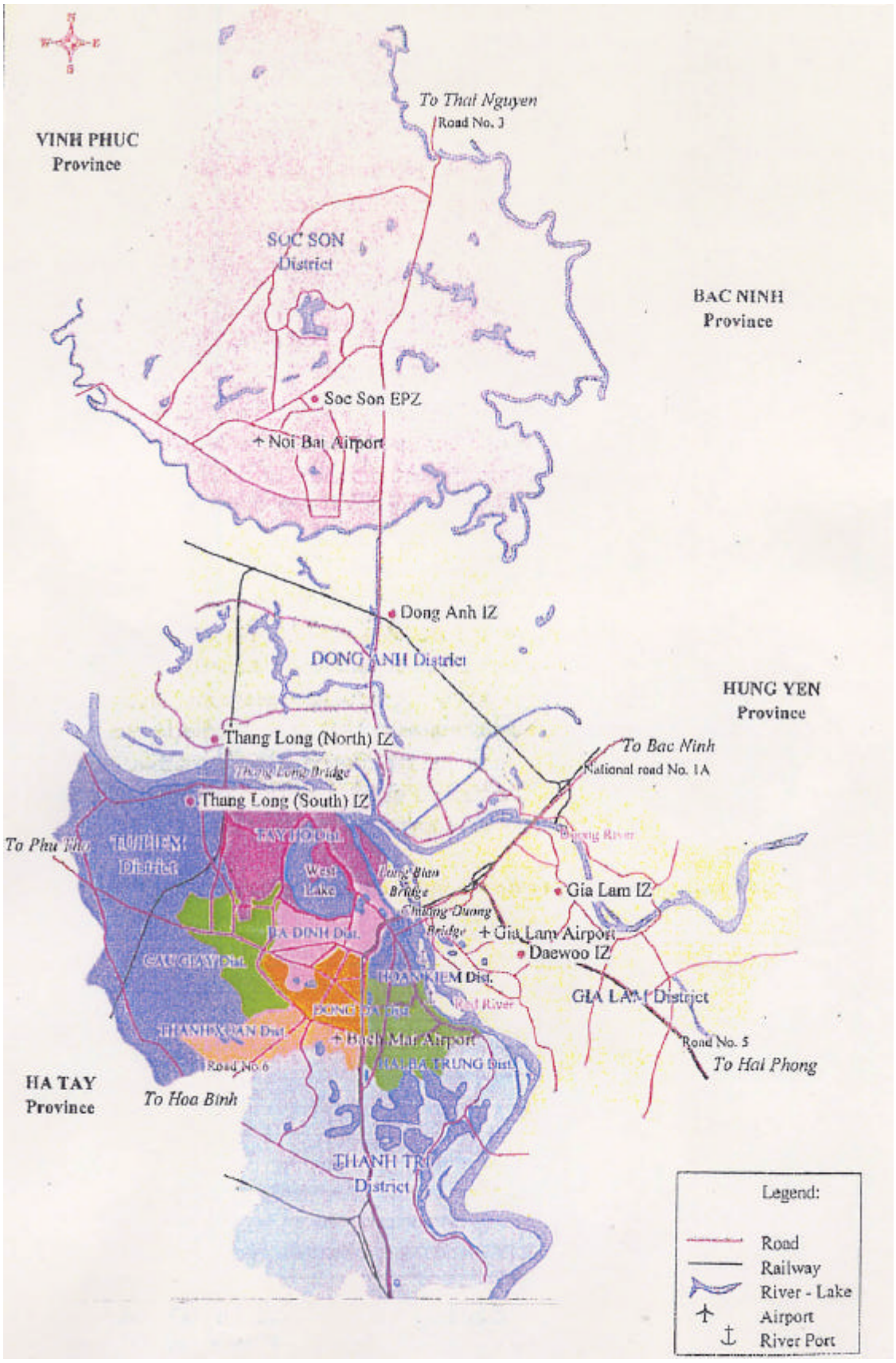


Figure 2.3.1 Existing and Proposed Industrial Zones in the Hanoi Master Plan

2. 4 Development of major industrial plants

2.4.1 Steel plants

During the period 1992-1997 the demand for steel annually increased by 134%. However, it was difficult to estimate actual domestic consumption since Viet Nam imported scrapped steel to operate small steel plants. In recent years Viet Nam Steel Corporation constructed several new plants to meet domestic demand as well as to save its foreign currency. As a result, local production expanded by nearly five times during the period 1992-1997. After the onset of the regional economic crisis, many steel plants have struggled to survive as steel stockpile grew due to weak domestic demand and available supply of other steel products. Domestic production in 1998 was estimated at 853,000 tons, the first decrease since the Doi Moi reform was initiated.

Before the crisis, Viet Nam Steel Corporation predicted that domestic steel demand would be 7.7 million tons in 2010 of which 7.0 million tons would be supplied by 18 domestic plants. In the face of current weak domestic demand and future economic slowdown, the country's production program needs to be reviewed. In the Red River Delta region, major steel plants are located in Hai Phong and Thai Nguyen. In the future, however, the production capacity of steel plants in Hai Phong and Quang Ninh is expected to expand. Existing and planned steel plants and their production capacity are summarized in **Table 2.4.1**.

Table 2.4.1 Major Steel Plants in the North (Existing and Planned)

Plant Name	Location	Production Capacity ('000 tons/year)		
		2000	2010	2020
CTLD Vina-Posco	Hai Phong	200	200	200
Vinasteel	Hai Phong	150	150	150
Thep Hai Phong	Hai Phong	180	180	180
Thep Voi Tam Vua	Hai Phong	-	600	600
Phuong Nam	Hanoi	46	50	100
Ma Kem	Hanoi	40	50	50
Ninh Binh	Ninh Binh	15	15	15
Nam Dinh	Nam Dinh	-	100	100
NM Thep Dac Biet	Bac Ninh	10	50	100
Phoi Thep Cai Lan	Quang Ninh	-	500	500
Thai Nguyen	Thai Nguyen	250	250	250
Nat Steel Vina	Thai Nguyen	54	120	120

Source) MOI, "Strategic Development of Industrial Sector", 2001

2.4.2 Cement plants

With an abundance of limestone and other mineral resources, Viet Nam has suitable locations for cement production. The Viet Nam Cement Corporation (VCC) dominates the local market and now has 52% market share. Regardless of stiff competition from the private sector and even as other foreign-invested cement plants will start operation in the near future, the VCC is investing in its facilities to gain more market share. At present, however, there is an oversupply, with more than 1 million tons of cement and 0.75 million tons of clinkers unsold despite a ban on cement imports in 1999.

In the north, cement is mainly produced in Hai Phong and Hai Duong. Improvement of production capacity will be further accelerated not only in these provinces but also in Ninh Binh and Quang Ninh. Existing and planned cement plants are profiled in **Table 2.4.2**.

Table 2.4.2 Major Cement Plants in the North (Existing and Planned)

Plant Name	Location	Production Capacity ('000 tons/year)		
		2000	2010	2020
Hai Phong	Hai Phong	300	1,400	1,400
Chinh Phong	Hai Phong	1,400	2,800	2,800
Hoang Thach	Hai Duong	2,300	2,300	2,300
Phuc Son	Hai Duong	-	1,800	1,800
Tam Diep	Ninh Binh	-	1,400	1,400
But Son	Ha Nam	1,400	1,400	2,800
Hai Long	Quang Ninh	-	1,400	1,400
Hoan Cau	Quang Ninh	-	1,400	1,400
Bim Son	Thanh Hoa	?	?	?

Sources) Viet Nam Cement Corporation
MOC, "Master Plan on Construction Material Industry in Viet Nam", 1998

2.4.3 Fertilizer plants

In 1997 the national output of chemical fertilizers was 982,400 tons. Phosphate and nitrogen fertilizers are mostly produced in the north. Appetite is used in manufacturing fertilizers, with reserves mainly in Lao Cai. Mined appetite in 1997 reached 581,000 tons.

Domestic production of fertilizers cannot compete with imported ones in terms of

price as well as quality. In 1997 imported chemical fertilizers reached 2,520,700 tons, 2.6 times more than domestic production. Even as domestic consumption increased yearly by 10% in the last decade, imported fertilizers similarly increased by 10%.

At present, most fertilizers are produced in Van Dien and Ninh Binh, with a new plant planned in Hai Phong. Existing and planned fertilizer plants are described in **Table 2.4.3**.

Table 2.4.3 Major Fertilizer Plants in the North (Existing and Planned)

Fertilizer	Plant Name	Location	Production Capacity ('000 tons/year)		
			2000	2010	2020
Phosphate	Van Dien	Hanoi	187	330	330
	Ninh Binh	Ninh Binh	105	320	320
	DAP Hai Phong	Hai Phong	-	330	330
?	?	Bac Giang	?	?	?
Nitrogen	Van Dien	Hanoi	14.2	20	40

Source) MOI, "Viet Nam Chemical Corporation", 2001

2.4.4 Thermal power plants

Among electricity plants, thermal power plants have the most impact on cargo movement especially of coal. Due mainly to environmental concerns, electricity plants will increasingly be supplied by hydro and gas, with the share of thermal power expected to decline in the future. As of 1999, electricity was supplied by hydro (51%), followed by diesel/gas (27%) and thermal power plants (15%). The use of hydropower plants in supplying the city with electricity was planned to reach 70% in 2010.

Table 2.4.4 Existing Power Plants in the North, 1999

Power Type	Plant Name	Production Capacity (MW)
Hydro	Hoa Binh	1,920
	Thac Ba	120
Thermal (Coal)	Pha Lai	440
	Uong Bi	105
	Ninh Binh	100

Major coal-powered electricity plants located in the north are Pha Lai, Uong Bi and Ninh Binh. Although rehabilitation and new construction of coal-powered electricity plants were planned, it is anticipated that only the extension of Pha Lai plant will have a substantial impact on coal transport in the future. Major thermal power plants planned are summarized in **Table 2.4.4**.

Table 2.4.5 Planned Thermal Power Plants in the North (Planned)

Plant Name	Location	Production Capacity (MW)	
		2010	2020
Pha Lai 2	Hai Duong	600	600
Hai Phong	Hai Phong	600	600
Thai Binh	Thai Binh	360	360

Source) MOI, "Strategic Development Plan of Industrial Sector", 2001