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THE MASTER PLAN STUDY

ON

LONG-TERM PLANNING AND ECONOMIC DEVELOPMENT

WITH SPECIAL REFERENCE TO THE ECONOMIC

DEVELOPMENT OF

WESTERN ISLANDS

AND THE ECONOMIC DEVELOPMENT OF THE

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THE NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE SOCIALIST REPUBLIC OF VIET NAM
MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

THE MASTER PLAN STUDY
ON
DONG NAI RIVER AND SURROUNDING BASINS
WATER RESOURCES DEVELOPMENT

FINAL REPORT

VOLUME III

APPENDIX I SOCIO - ECONOMY AND INSTITUTION

AUGUST 1996

NIPPON KOEI CO., LTD., TOKYO JAPAN

This Report consists of

Volume I	Executive Summary	
Volume II	Main Report	
Volume III	Appendix I	Socio-economy and Institution
Volume IV	Appendix II	Topography and Geology
	Appendix III	Meteorology and Hydrology
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Volume X	Appendix X	Formulation of Master Plan
Volume XI	Data Book	



The cost estimate was based on the December 1995 price level and expressed in US\$ according to the exchange rate of US\$ 1.00 = Vietnamese Dong 11,014 = Japanese Yen 101.53 as of December 15, 1995.

LIST OF ABBREVIATIONS

AFS	Agriculture and Forestry Service (PC)
CEMMA	Committee for Ethnic Minorities and Mountainous Areas
DCWSSS	Design Company for Water Supply and Sanitation System (HCMC-PC)
EA	Environment Assessment (Multi-lateral Lending Agencies)
ECSP	Evaluation Commission for State Projects
EIA	Environmental Impact Assessment
ENCO	Ho Chi Minh City Environmental Committee
EVN	<i>General Company of Electricity of Viet Nam (Abolished and renamed in November 1995 as Vietnamese Power Corporation)</i>
FIPI	Forest Inventory and Planning Institute (MOARD)
GCOP	Governmental Committee on Organization and Personnel
GDLA	General Department of Land Administration
GDMH	General Department of Meteorology & Hydrology
GOV	Government of Viet Nam
GSO	General Statistical Office
HCMC	Ho Chi Minh City
HFC	Ho Chi Minh Environment Committee (HCMC)
HIDC	Hydraulic Investigation and Design Company (MOARD)
HPC	Ho Chi Minh People's Committee (HCMC)
HSDC (or SDC)	Ho Chi Minh Sewerage and Drainage Company (HCMC)
HWSC (or WSC)	Ho Chi Minh Water Supply Company (HCMC)
IDD	Irrigation and Drainage Department (MOARD)
IEE	Initial Environmental Examination
IER	Institute for Economic Research (HCMC-PC)
IHPH	Institute of Hygiene and Public Health (MOPH)
IM	Institute of Mines (MOID)
INVESCO	Investment Company for the Development of Water Sector (HCMC-PC/TUPWS)
IOE	Institute of Energy (MOID)
IURP	Institute of Urban and Rural Planning (HCMC-PC/Construction Service)
IWRE	Institute of Water Resources Economics (MOARD)
IWRP	Institute of Water Resources Planning (MOARD)
IWRR	Institute of Water Resources Research (MOARD)
JICA	Japan International Cooperation Agency (Japan)

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IWRE	Institute of Water Resources Economics (MOARD)
IWRP	Institute of Water Resources Planning (MOARD)
IWRR	Institute of Water Resources Research (MOARD)
JICA	Japan International Cooperation Agency (Japan)

MOAFI	<i>Ministry of Agriculture and Food Industry (Abolished and integrated into the new MOARD)</i>
MOAP	Ministry of Aquatic Products
MOARD (New)	Ministry of Agriculture and Rural Development (Created in October 1995 by the merger of the former Ministry of Water Resources, Ministry of Agriculture and Food Industry and Ministry of Forestry)
MOC	Ministry of Construction
MOCI	Ministry of Culture and Information
MOD	Ministry of Defence
MOE	<i>Ministry of Energy (Abolished and integrated into the new MOID)</i>
MOET	Ministry of Education and Training
MOFI	Ministry of Finance
MOFO	<i>Ministry of Forestry (Abolished and integrated into the new MOARD)</i>
MOFA	Ministry of Foreign Affairs
MOHI	<i>Ministry of Heavy Industry (Abolished and integrated into the new MOID)</i>
MOID(New)	Ministry of Industry (Created in November 1995 by the merger of the former Ministries of Heavy Industry, Light Industry and Energy)
MOJ	Ministry of Justice
MOIT	Ministry of Interior
MOLI	<i>Ministry of Light Industry (Abolished and integrated into the new MOID)</i>
MOLWISA	Ministry of Labour, War Invalids and Social Affairs
MOPH	Ministry of Public Health
MOPI (New)	Ministry of Planning and Investment (Formed from a merger of the former SPC and SCCI)
MOSTE	Ministry of Science, Technology and Environment
MOTC	Ministry of Transport and Communications
MOT	Ministry of Trade
MOWR	<i>Ministry of Water Resources (Abolished and integrated into the new MOARD)</i>
MPAC	Ministrial Project Appraisal Committee
NEA	National Environment Agency
NGO	Non-Governmental Organization
NIAPP	National Institute for Agricultural Planning and Projection
NPAC	National Project Appraisal Committee
OECC	Overseas Environmental Cooperation Centre
OECF	Overseas Economic Cooperation Fund (Japan)
PC	People's Committee (executive arm of the People's Council)

PCC	Power Construction Company (VPC)
PIDC	Power Investigation and Design Company (VPC)
PPC	Provincial People's Committee (City People's Committee = CPC)
SBV	State Bank of Viet Nam
SCCI	<i>State Committee for Cooperation and Investment (Abolished and integrated into the new MOPI)</i>
SFEZ (or SFEA)	Southern Focal Economic Zone (or Southern Focal Economic Area)
SIWRP	Sub-Institute of Water Resources Planning (MOARD-IWRP)
SIWRR	Southern Institute of Water Resources Research (MOARD)
SPC	<i>State Planning Committee (Abolished and integrated into the new MOPI)</i>
SRV	Socialist Republic of Viet Nam
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Education Fund
UNIDO	United Nations Industrial Development Agency
VPC (New)	Vietnam Power Corporation (the former General Company of Electricity of Viet Nam = EVN)
WASECO	Water and Sewerage Construction Company (MOC)
WB	World Bank
WHO	World Health Organization
WPMI (IWRPM)	Water Planning and Management Institute (MOARD)
WRD(or WRS)	Water Resources Department or Water Resource Service (PC)
WSC	Water Supply Company (under Construction Services of the PC)

Note : Abbreviations in *Italics* are no more existent (already abolished and integrated in November 1995).

Measurements

Length

mm	=	millimeter
cm	=	centimeter
m	=	meter
km	=	kilometer
ft	=	foot
yd	=	yard

Area

cm ²	=	square centimeter
m ²	=	square meter
ha	=	hectare
km ²	=	square kilometer

Volume

cm ³	=	cubic centimeter
l	=	litre
kl	=	kilolitre
m ³	=	cubic meter

Weight

g	=	gram
kg	=	kilogram
ton	=	metric ton

Time

s	=	second
min	=	minute
h	=	hour
d	=	day
y	=	year

Electric Measurements

V	=	Volt
A	=	Ampere
Hz	=	Hertz (cycle)
W	=	Watt
kW	=	kilowatt
MW	=	Megawatt
GW	=	Gigawatt

Other Measures

%	=	percent
PS	=	horsepower
°	=	degree
10 ³	=	thousand
10 ⁶	=	million
10 ⁹	=	billion

Derived Measures

m ³ /s	=	cubic meter per second
kWh	=	Kilowatt hour
MWh	=	Megawatt hour
GWh	=	Gigawatt hour
kVA	=	kilovolt ampere

Currencies

US\$	=	US Dollar
VND	=	Vietnamese Dong

Volume III

Appendix I

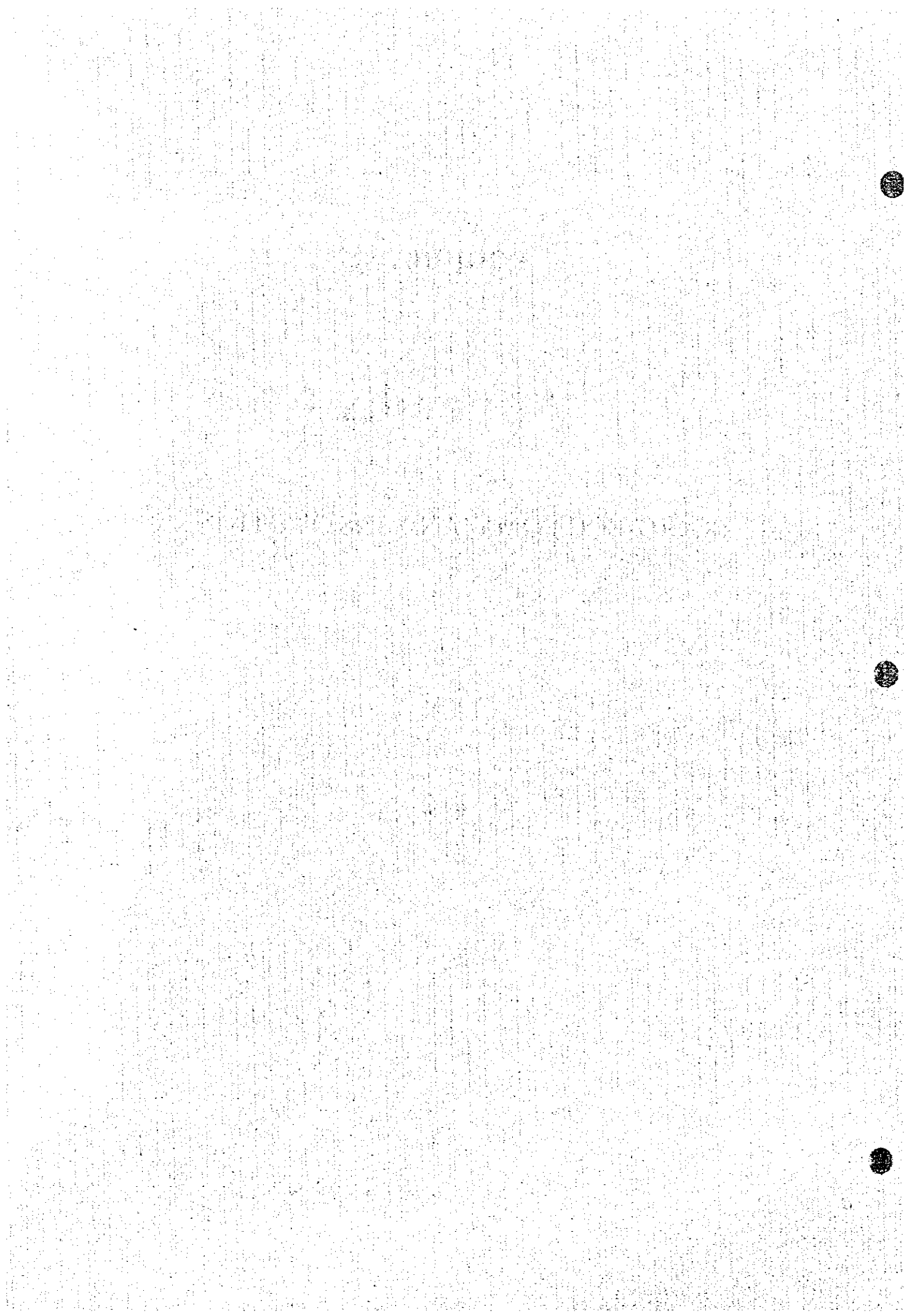
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1. STUDY AREA IN NATIONAL DEVELOPMENT

1.1 Study Area in National Development

1.1.1 National Economic and Spatial Development

Since the year 1986, the Vietnamese Government is carrying out drastic reforms in the political, economic and social fields under the banner of "Doi Moi" (renovation in Vietnamese). Doi Moi has two major objectives to pursue in the economic field: 1) an economic liberalization policy at home and 2) an open door policy internationally.

This renovation programme begun in the year 1986 and accelerated in the year 1989 includes the following reforms:

- Provision of long-term land tenure rights, facilitating household farming;
- Opening-up of opportunities for private sector development;
- Increased autonomy for state enterprises and requirements that they operate on a non-subsidized basis and in a competitive environment;
- Decontrol of prices, allowing market supply and demand forces to work;
- Devaluation of the official exchange rate;
- Trade liberalization and reorientation to export-led growth;
- Encouragement of foreign investment;
- Reform of the fiscal and monetary system to better balance the budget, strengthen tax revenues, stimulate savings and control inflation; and
- Adoption of the new Constitution in the year 1992, introducing changes to democratic freedom and property rights.

The following present growth rates of Gross Domestic Product (GDP) recorded in major sectors over a time period of the year 1990 to 1995:

	(Unit: % Change)							
	1990	(share)	1991	1992	1993	1994	1995*	(share)
GDP	5.1	(100.0)	6.0	8.7	8.1	8.8	9.0 - 10.0	(100.0)
Agriculture	1.5	(38.8)	2.2	7.2	3.8	4.5	4.5 - 5.0	(26.6)
Industry	2.5	(22.6)	9.9	14.4	12.1	13.5	13.0 - 14.0	(30.3)
Service	10.4	(38.6)	8.3	8.6	9.9	11.0	12.0 - 13.0	(42.5)

Note: * Estimate

Source: State Planning Committee (SPC)

With economic recession due to the shock occasioned by the collapse of the Soviet Union in the year 1990, the GDP declined from 8.0 % attained in the year 1989 as the result of Doi Moi policy to 5.1 % in the year 1990 and 6.0 % in the year 1991. However, the economy fully recovered and climbed to 8.7 % in the year 1992, and healthy growth continued in the year 1993 and 1994 with 8.1 % and 8.8 % rates, respectively. In the year 1994, GDP recorded in Viet Nam is estimated at VND 170,258 billion, which is equivalent to US\$ 15.5 billion (refer to Table 1.1). This no doubt considerably understates the GDP actually gained, since there is large informal economy.

About the future GDP growth rates of Viet Nam, there are several different projections, both optimistic/ambitious and probable (refer to Table 1.2). Some forecast 8 to 9 % of GDP growth to the year 2010. On the other hand, the economic growth rates that World Bank forecast for total economy over the time period of the year 1990 to 2012 are ranging from 6.0 % on an average in the most probable scenario to 7.2 % on an average in the most optimistic scenario (refer to 2/2 of Table 1.2).

In any case, most of authorities and experts forecast that the South including the Southern Focal Economic Area (SFEA), which covers the main part of the Study Area, i.e. whole Ho Chi Minh City and Ba Ria-Vung Tan province and parts of Dong Nai, Song Be, Tay Ninh, Long An and Binh Thuan provinces with a land area of 12,413 km² and a population of about 7.8 million, will develop with more higher economic growth rates than those of other localities. It is believed that if there will not be any big economic, political or social change, the SFEA will continue to grow with an economic growth rate of over 10 % to 15 % (refer to 1/2 of Table 1.2).

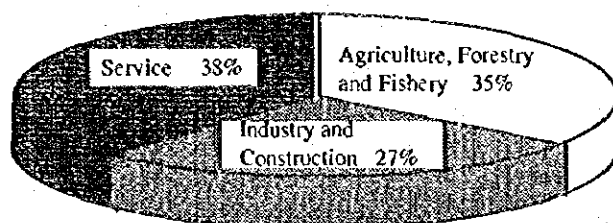
Viet Nam is basically an agricultural country where over 80 % of the population still live in rural areas, supported by farming, forestry and fishery. Grain crops, dominated by paddy, generate half the output value of this sector. Besides, a high proportion of industry and services derives their demand from agriculture.

But, because of its vulnerability to vagaries of nature, the growth rate of agriculture witnessed larger fluctuations than that of industry. The agriculture sector, including forestry and fishery, accounted for 35 % of GDP in the year 1994 (refer to Table 1.1), nearly three-quarters of national employment (refer to Table 1.3) and about 50 % of export earnings.

Due to the liberalization of distribution system in agricultural sector, paddy production recorded 26 % growth in the year 1987 to 1989, and this permitted Viet Nam to move from a position of net importer of 700,000 to 800,000 tons of rice in the year 1986 to 1988 to a net exporter of around 2 million tons of rice per annum in the year 1989 to 1992.

The industry sector including manufacturing, energy, mining and construction is still narrow and fragile, contributed 27 % to GDP in the year 1994 as depicted below:

**Gross Domestic Product (GDP) by Kind of Economic Activities
in the Year 1994 (At Constant Price Of the Year 1989)**



Source: Statistical Yearbook 1994, General Statistical Office

Large-scale manufacturing in Viet Nam is state-owned and managed by line ministries of the central government. Incomes from state enterprises have been the main source of revenue for the government (refer to Table 1.4). As geographical distribution of industries, many of them are concentrated in the North except for oil, while light industries are located throughout the country, but are concentrated in the South.

An inflation rate which was close to about 100 % per annum during the 1980s has slowed down to 17 % in the year 1992. While Viet Nam has a per capita income estimated at about US\$ 200 to \$ 220, it has a highly literate and skilled population (literacy: 89 %).

It is noteworthy that there exist large regional imbalances and differences with different endowments and potential. This is not simply a North-South matter. For example, Ho Chi Minh City and its surrounding areas are more wealthier than the rest of the South, while the South Central Coast and Highlands, i.e. Binh Thuan and Ninh Thuan provinces, are quite poor. In a region, some areas suffer from much greater concentration of poverty than others. Following show three income categories in the nation:

High Income Province (Per Capita GDP: > VND 450,000)	Middle Income Provinces (Per Capita GDP: ≥ VND 300 - 450,000)	Low Income Provinces (Per Capita GDP: < VND 300,000)
1. Ba Ria-Vung Tau	1. Tien Giang	1. Lang Son
2. Ho Chi Minh City	2. Yen Bai	2. Ninh Binh
3. Ha Noi	3. Soc Trang	3. Tuyen Quang
4. Dong Nai	4. Bac Thai	4. Ha Bac
5. Kien Giang	5. Tay Ninh	5. Ninh Thuan
6. Quang Ninh	6. Ben Tre	6. Gia Lai
7. Khanh Hoa	7. Song Be	7. Thua Thien
8. Hai Phong	8. Lam Dong	8. Quang Binh
9. Hoa Binh	9. Dong Thap	9. Binh Dinh
10. Vinh Long	10. Quang Nam	10. Binh Thuan
11. Tra Vinh	11. Hai Hung	11. Cao Bang
12. Long An	12. Vinh Phu	12. Quang Tri
13. An Giang	13. Thanh Hoa	13. Nghe An
14. Can Tho	14. Nam Ha	14. Quang Ngai
15. Minh Hai	15. Thai Binh	15. Ha Tinh
16. Dac Lac	16. Kon Tum	16. Ha Giang
	17. Lai Chau	17. Lao Cai
	18. Phu Yen	18. Son La
	19. Ha Tay	

Note: Provinces related to the Study Area are shaded.

Source: Viet Nam-Poverty Assessment and Strategy, January 1995, Document of the World Bank

Viet Nam is endowed with a relatively wide range of natural resources including agricultural land, oil, coal and minerals, water resources for irrigation, water supply, hydroelectric power generation, forest & marine resources and others. It is noticeable that among others, the hydroelectric production increased at a remarkably high pace of 30.3 % per annum from the year 1986 to 1992 (refer to Table 1.5).

Surface water is evenly located throughout the country, thus being capable of meeting the requirements for the development of industry, agriculture (irrigation, aquaculture, etc.), communication and transportation and the daily needs. However, uneven flow distribution in both time and space and limited water development have resulted in waterlogging, flooding, drought and water shortage at many places. Demographic and economic expansions have caused pollution in some areas, affecting water supply and human life.

Additionally, Viet Nam also has advantage of labour force not only in terms of quantity but also in quality. The number of population at the age of 15 to 44 accounts for 45 % of the total population. Young and abundant labour combined with a high literacy rate (87.7 % for 10 years old over) is the most important resources for economic development. Data on human development indicators in Viet Nam are summarized in Table 1.6.

1.1.2 National Spatial Structure

The Socialist Republic of Viet Nam, lying on the eastern side of the Southeast Asian Peninsula with a land area of 331,114 km², is characterized by the long shape in the north-south direction and short shape in the east-west direction; that is, 1,650 km long in the north-south direction with 3,260 km long coastline, whilst the length of east-west direction is the maximum with a value of 600 km in the northern part and the minimum with a value of 50 km in the central part.

Due to the geographic characteristics which are long in the north-south direction and undulating terrains, Viet Nam is divided into following seven ecological zones (refer to Figure 1.1), and the Study Area composed of Ho Chi Minh City and nine provinces lying in southern Viet Nam extends in the four ecological zones including a marginal part of the Mekong Delta zone (51.3 % of land area of Long An province) as summarized below:

<i>(Study Area)</i>	
1) North Mountains	
2) Red Delta River and Midland	
3) North Central Coast	
4) South Central Coast	: <i>Ninh Thuan & Binh Thuan</i>
5) Central Highlands	: <i>Lam Dong (74.0 % of its total land area) & Dac Lac (19.4 % of its total land area)</i>
6) North East of Southland	: <i>Ho Chi Minh City, Song Be, Tay Ninh, Dong Nai & Ba Ria -Vung Tau</i>
7) Mekong River Delta	: <i>Long An (51.3 % of its total land area)</i>

In the year 1993, the population of Viet Nam was nearly 71 million, corresponding to an average of 214 inhabitants per km², and growing by 2.47 % per annum during the 1989 to 1993 period.

In terms of demographic distribution, Viet Nam is characterized by strong primacy of two cities; urban populations in Ho Chi Minh City (3.2 million) and Hanoi Capital (1.1 million), accounting for about 31.3 % of the total urban population.

During the 1980s, the natural urbanization trend was counteracted by the Government resettlement programmes moving people from large cities and the densely populated plains to the central highlands and the southeast. Although the Government will continue its policy to counteract a large inflow to the major cities such as Ho Chi Minh City and Hanoi, an increasing number of resource-poor rural households are likely to be further marginalized and will have to seek employment in urban areas. In face of this trend, the Government plans to establish several urban growth centres as alternatives to Ho Chi Minh City and Hanoi.

Urban areas have shown relatively high rates of population increase over 2.4 % per annum during the time period of the year 1979 to 1989. The urban population growth rate is estimated to be 3.7 % per annum during the year 1990 to 1995 and will reach 4.1 % during the year 1995 to 2000. It is noticeable that in provinces or areas neighbouring on the major large cities, the high population growth is observed.

1.2 Socio-economy in the Study Area

1.2.1 Administration

The Study Area, covering the Dong Nai River and its surrounding river basins with an area of some 48,500 km² or sharing 14.6 % of the total land area of the country (331,113.6 km²), extends over one city and nine provinces of southern Viet Nam; Tay Ninh, Song Be, Dac Lac, Lam Dong, Ninh Thuan, Binh Thuan, Ba Ria-Vung Tau, Dong Nai, Ho Chi Minh City and

Long An. Administrative boundaries of these one city and nine provinces are given in Figure 1.2 with provincial and district capitals, whilst Table 1.7 shows a summary list of provinces and districts in the Study Area.

Con Dao district in Ba Ria-Vung Tau province and Phu Quy district in Ninh Thuan province are out of the Study Area due to the islands scattered in the South China Sea. Of 17 districts in Dac Lac province, an entire area of Dak Nong and Dak R'Lap districts is included in the Area, whilst forest areas of Lac Duong district in Lam Dong province lie out of the Study Area. In Long An province, included in the Study Area are nine districts, of which Thu Thua, Thanh Hoa and Moc Hoa districts partially lie in the Study Area. Of 18 districts in Ho Chi Minh City, 12 districts are defined as its urban area and treated as one area in the Study.

1.2.2 Infrastructures

Road network in the Study Area is developed by placing Ho Chi Minh City as its centre (refer to Figure 1.2). National Highway No. 1, which links between Ho Chi Minh City and Hanoi, runs in the coastal area through major towns of Bien Hoa, Phan Thiet and Phan Rang. Another main route from Ho Chi Minh City to Hanoi is National Highway No. 20, which passes in the hilly area of Dong Nai and Lam Dong provinces through Da Lat.

National Highways No. 13 and No. 22, which go through Tay Ninh, are the access roads to Cambodia, whilst National Highway No. 14 leads Laos. National Highway No. 4 is used for accessing to large towns in Mekong Delta such as Can Tho and My Tho through Tan An. It is noted that National Highway No. 51 linking Bien Hoa and Vung Tau constitutes part of the artery of the so-called economic triangle zone in the Study Area.

Railway service, which links Ho Chi Minh City to Hanoi, runs along National Highway No. 1 in the Study Area. Due to slow speed resulting from aged track, railway service is less reliable than vehicle as transportation means. There are two ports in the Study Area, i.e. Saigon and Vung Tau ports, for ocean freight. In particular, the Saigon port, transaction amount of which exceeds 3 million ton a year, acts as a pivot of economic activities in southern Viet Nam. Meanwhile, there are two airports in the Study Area; Tan Son Nhut air port in Ho Chi Minh City and Da Lat airport. The former is used as a gateway to and from foreign countries, whilst domestic flights only for the latter.

1.2.3 Population

The population in the Study Area is estimated at some 11.7 million in the year 1994 as summarized in Table 1.8, whilst Figure 1.3 graphically contrasts the difference of population among the provinces in the Study Area. Average population density in the Study Area is about 241 persons per km² with the highest rate of 2,101 persons per km² in Ho Chi Minh City and the low rate of 61.1 persons per km² in Dac Lac province and 75.7 persons per km² in Lam Dong province in the Central Highlands. Majority in these sparsely populated areas is minority groups.

Population in the Study Area grew at a rate of 2.74 % per year between the year 1979 and 1989, which was faster than that of the nation at 2.01 % per year for the same period as given in Table 1.9. Due to fast economic growth, projected population for "medium (base) case" in the Study Area is estimated at gradually decreasing rates of 2.68 % over a period of the year 1993 to 2000, 2.44 % over a period of the year 2000 to 2005, 2.23 % over a period of the year 2005 to 2010 and 2.00 % over a period of the year 2010 to 2015, resulting in a total population of some 19.3 million in the year 2015 and accounting for 18.0 % of total population in the nation. Of 19.3 million, urban residents will reach some 7.8 million, whilst 11.5 million for rural areas. Following summarizes population growth in the Study Area over a time period of the year 1995 to 2015 with high and low scenarios:

Year	Population Projection		
	Low	Medium (Base Case)	High
1995	12,127,625	12,158,393	12,163,130
2000	13,754,794	13,877,316	13,896,248
2005	15,411,051	15,655,009	15,722,329
2010	17,081,876	17,480,149	17,615,503
2015	18,712,315	19,299,496	19,544,464

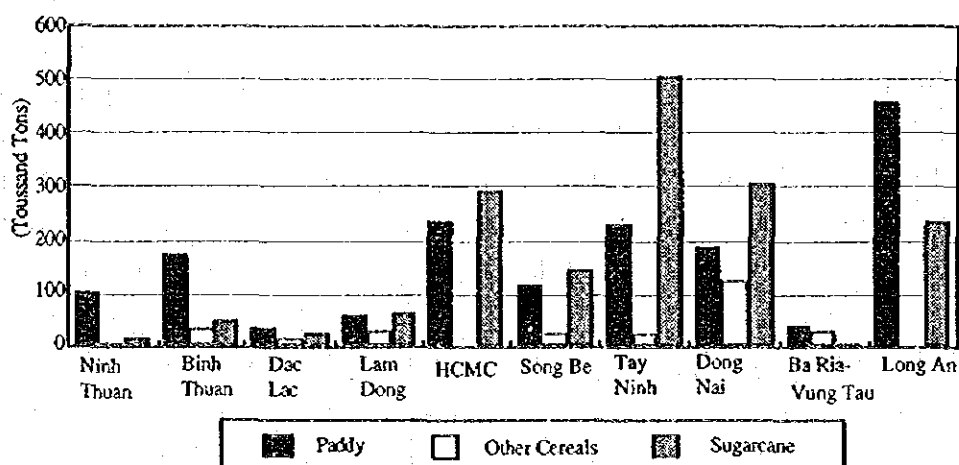
Note: For more detailed information on the projected population for "base case", refer to Table 1.9.

1.2.4 Agriculture

This Master Plan Study includes as its Study Area a part of the Mekong Delta (Long An province) which is the largest rice bowl of the country with a production of 837.2 thousand ton in the year 1992 (refer to Table 1.10) and sustains the status of rice exporter. As to the yield of rice production, the coastal two provinces recorded relatively high yields over 3 tons per ha on the annual average in the 1989 to 1992 period; 3.86 tons per ha in Ninh Thuan and 3.03 tons

per ha in Binh Thuan. Figure 1.4 depicts graphical comparison of production and unit yield of rice.

Maize, which is a major crop in other cereals in Table 1.10, is mainly cultivated in the upland areas of Dong Nai, Dac Lac and Lam Dong provinces, while sugarcane production is active in the lowlands of Tay Ninh, Long An, Dong Nai and Ho Chi Minh City (refer to Figures 1.5 and 1.6). Following summarize average yields of major crops recorded over a time period of the year 1990 to 1993 in the Study Area by province:



Notes: Average gross outputs for paddy and other cereals from the year 1990 to 1993; Average gross output for sugarcane from the year 1992 to 1993.

Source: Statistical Yearbook 1994, General Statistical Office

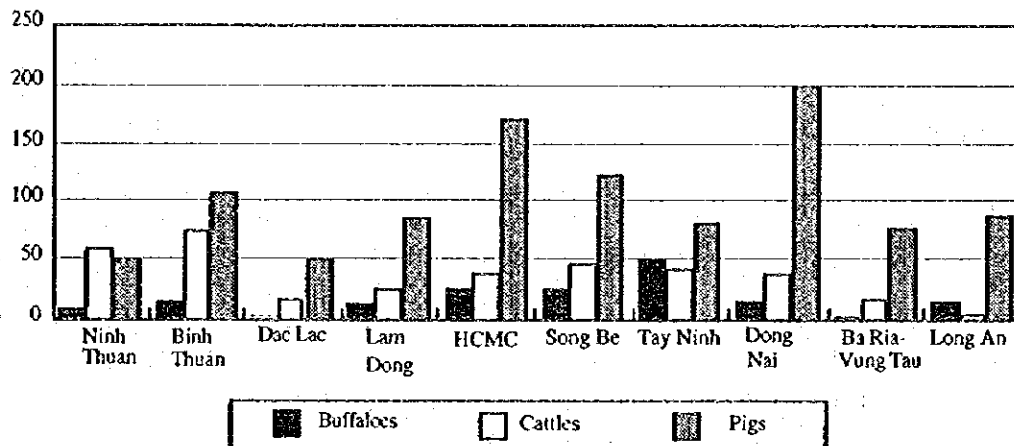
As for the agricultural gross production, the Study Area accounts for only 14.2 % of the country's total in the year 1992 (refer to Table 1.11). However, this share increases slightly from 13.6 % in the year 1990 to 14.2 % in the year 1992. Within the Study Area, Dong Nai province ranks first in the year 1992 with about VND 674 billion in the agricultural gross production, representing 28.4 % of the Study Area total. Figure 1.7 compares gross productions of agriculture for the provinces in the Study Area.

Table 1.12 indicates the agricultural activities and food production situation in the Study Area. The total average of food gross output (paddy equivalent) in the Study Area is at 258.5 kg per capita in the year 1993. This volume is fairly small compared to the national total average of 359.0 kg per capita. To sum up, as far as the agricultural production is concerned, the contribution of the Study Area is still small, accounting for only 9.0 % of the country's total in the year 1994.

In addition to the food crops mentioned above, various industrial & cash (high value) crops are cultivated in the Study Area. They include coffee, cotton, tobacco, soybean, peanut, mulberry, rubber, cashew, pepper, jute, rush and so on.

1.2.5 Livestock

As shown in Table 1.10, major breeding stocks in the Study Area include buffaloes, cattle and pigs. According to this Table, the number of water buffaloes is large especially in paddy cultivation areas like Tay Ninh and Long An provinces, while cattle raising is active in the hilly areas in Dac Lac, Binh Thuan and Ninh Thuan provinces. Pig breeding is commonly practiced in the Study Area, mostly in the backyard of farms. These data on main breeding stocks recorded between the year 1992 and 1993 in the Study Area can be summarized as an average value by province as follows:



Source: Statistical Yearbook 1994, General Statistical Office

1.2.6 Fishery

As shown in Figure 1.8, both the freshwater and aquaculture productions are generally not so active in the Study Area. The freshwater (inland) fishery production is mainly practiced in Dong Nai, Ho Chi Minh City, Long An and Tay Ninh provinces. The total gross output in the above four provinces amounts to 19,099 tons in the year 1992, accounting for about 15 % of the national total.

On the other hand, the coastal provinces consisting of Binh Thuan, Ba Ria-Vung Tau and Ninh Thuan are major producers of marine and brackish fishes with a total production of 166.9 thousand tons in the year 1993 (refer to Table 1.13 and Figure 1.8). A total of 500 species of fish and shrimp, 60 species of which have high economic values, are caught or raised at their coasts; they include shad, herring, mackerel, lobster, silver prawn, flowered prawn and so on.

1.2.7 Forestry

According to Table 1.14, forest land area in the Study Area amounts to 18,326 km² in the year 1993, accounting for 19.0 % to the national total. This forest area shares about 37.8 % of the total Study Area, i.e. around 48,500 km². In Dac Lac, Lam Dong, Binh Thuan and Ninh Thuan provinces, the ratio of forestry land is over 50 %, while low ratios below 20 % are observed in Tay Ninh (10.7 %), Long An (11.0 %) and Ho Chi Minh City (11.6 %).

Figure 1.9 illustrates the forest area and gross output of wood exploited in the Study Area. The gross output of wood exploited in Study Area totals to around 419,000 m³ in the year 1992. Out of this total, Lam Dong province counts over 170,000 m³, corresponding to about 41 % of the Study Area's total.

1.2.8 Industry and Mining

In the offshore of Vung Tau city, the hydrocarbon potential of the continental shelf started to be tapped. Oil exports earned US\$ 720 million, equivalent to approximately 8 % of GDP. Viet Nam's oil potential, estimated at 30 to 37 billion barrels, has attracted considerable foreign investment interest. In addition to energy endowments, the Study Area has deposits of bauxite, gold, zinc & lead, tin, kaolin and so on, mostly in Central Highlands (Lam Dong and Dac Lac provinces).

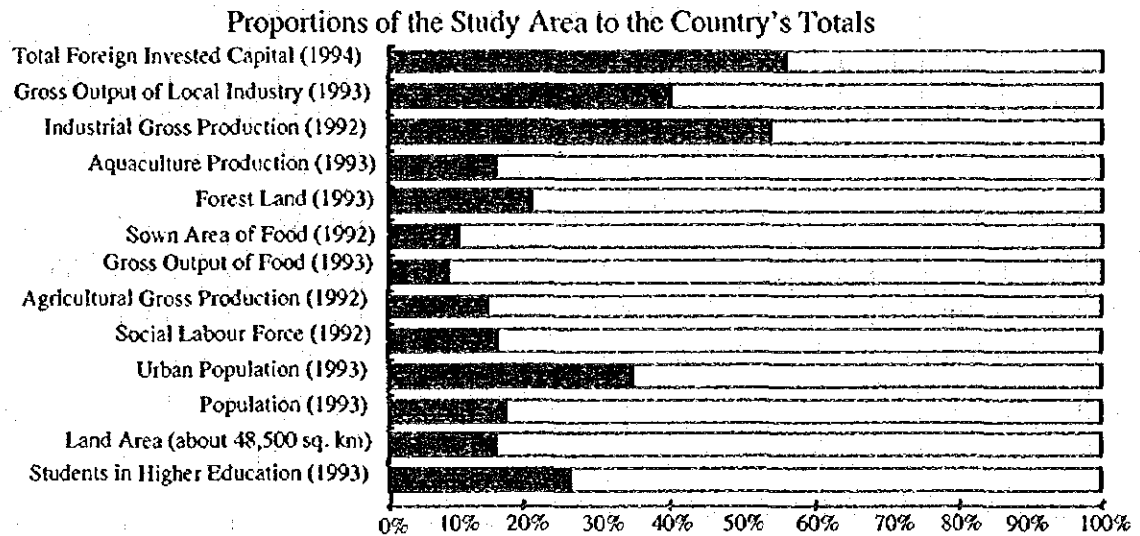
In the year 1992, the industrial gross production in the Study Area accounts for over 50 % to the country total. In the same year, Ho Chi Minh City's annual industrial production alone makes up nearly one third of the industrial output of the whole country, and occupies 40 % of the city's GDP (refer to Table 1.11 and Figure 1.7). Ba Ria-Vung Tau province ranks second after HCMC with its shares occupying 31.6 % in the Study Area's total and contributing to 16.9 % of the country total.

Today, Dong Nai province is slated to become, together with Ho Chi Minh City and Ba Ria-Vung Tau, one of the three main areas on the developing axis in the South of Viet Nam by the year 2000. The government entrusted Dong Nai province 13,500 hectares to create its industrial economic zones. Forty projects are now calling for funding to upgrade infrastructure and modernize facilities and equipment in Bien Hoa Industrial Zone (refer to Table 2.3 of Appendix VII for further discussions).

Data on the main industrial and export products in the Study Area are given in Tables 1.15 and 1.16.

1.3 Position of the Study Area in the National Socio-economy and Spatial Development

The socio-economic indices summarized below characterize basically the Study Area and define globally its position in the country:



Viet Nam's economy, reflecting its physical geography, climate and political history, is significantly different in each region, ecological zone and even in respective areas. Relative position of the Study Area in the national socio-economic and spatial development outlined above may be summarized as discussed below.

1.3.1 Position in the National Socio-economy

(1) Pivotal socio-economic growth centre in the country

In the year 1994, the population in the Study Area was 11.7 million, accounting for 16.3 % of the country's total population (refer to Table 1.8). GDP in the Study Area totaled about VND 10.7 trillion in the year 1993, and this amounted to 32.0 % of the national total (refer to Table 1.17). The per capita GDP in the area was VND 936,000 in the same year, which was almost twice the country average, which is VND 478,000.

In the year 1992, the gross production of agriculture of the Study Area shares 14.2 % to the national total, while the gross production of industry contributes 53.5 % to its total (refer to Table 1.11). For the value of exports in foreign trade, the Study Area accounts for 21.7 % to

the national total in the year 1992. Excepting the figure in agricultural gross production, these are substantially larger than the territorial share of Study Area at 14.6 % (some 48,500 km² out of the national land: 331,113.6 km²).

(2) Leading industrial development area

The economic triangle zone, connecting Ho Chi Minh City-Bien Hoa-Ba Ria-Vung Tau areas, constitutes one of the key economic growth areas in Viet Nam. This economic growth zone is the biggest area in oil and gas exploitation, and processing. In this area, the industry specialized in high-quality consumer goods will be developed for export, supplying to other areas with such products as electronic and domestic appliances, textile, ready-made clothes, motor-bikes, processed farm produce, maritime products and so forth.

As shown in Table 1.18, the core industrial area is Ho Chi Minh City (HCMC) which contributes to nearly 29 % (39.1 % share of the Study Area to the country total multiplied by 73.5 % share of Ho Chi Minh City) of the gross output of local industry in Viet Nam in the year 1993. The more developed status of the Study Area appears also in population with the share of urban population at 40.3 % in the year 1993, as compared to the national urbanization ratio of 19.5 %.

The GDP share and foreign investment and expenditure allocation in the respective regions of Viet Nam are summarized as below:

GDP, Investment and Expenditures Shares by Regions

	GDP in 1993*		Foreign Investment**		Expenditure in 1992	
	(million VND)	(%)	(million \$)	%	(million VND)	%
North Mountain and Midland	4,049,122	(12.1)	255	(4.4)	1,422,750	(16.9)
Red River Delta	6,192,451	(18.5)	498	(8.5)	1,539,987	(18.3)
North Central Coast	2,642,118	(7.9)	231	(3.9)	820,340	(9.8)
South Central Coast	2,442,598	(7.3)	311	(5.3)	821,484	(9.8)
Central Highlands	1,105,666	(3.3)	111	(1.9)	357,501	(4.3)
North East South	9,714,407	(29.0)	4,160	(71.0)	1,970,891	(23.5)
Mekong River Delta	7,330,639	(21.9)	289	(4.9)	1,471,110	(17.5)
Study Area	10,678,018	(31.9)	4,296	(73.4)	2,293,685	(27.3)
Total	33477,001	(100.0)	5,856	(100.0)	8,404,063	(100.0)

Note: * GDP at 1989 price.

** Prescribed capitals as of October 1995, excluding oil & gas projects and overseas investment projects.

The regions relating to the master plan study are shaded.

Sources: Viet Nam - Poverty Assessment and Strategy, World Bank, January 1995 and State Committee for Cooperation and Investment (SCCI)

The above figures indicate that the investments, which are the sum of both public and private sectors, are concentrated in the South, especially in Ho Chi Minh City and its neighbouring areas. On the contrary, two regions, i.e. Central Highlands and North and South Central Coasts belonging partly to the Study Area, are extremely lagged behind in every aspect. To ensure an equitable distribution of the benefits from development, it is a "must" to pay attention to a balanced regional development.

The Study Area, however, has relatively small shares of the state investment outlay, accounting for only 11.4 % in the year 1992 (refer to Table 1.11). This implies that the share of private sector investment (or foreign direct investment) occupies a large share in this area (refer to Table 1.19).

(3) Rich human resources

The population growth rate in the Study Area is recorded at 2.74 % per annum in the 1979 to 1989 period and increases to 2.83 % per annum during the 1989 to 1993 period (refer to Table 1.9). The Study Area records relatively higher growth rates than the country's annual averages, i.e. 2.01 % in the 1979 to 1989 period and 2.09 % in the 1989 to 1993 period.

Human resources in the Study Area are generally better prepared and better organized. The rates of students in the universities/colleges and technical schools in the Study Area are at 30.9 % and 24.4 %, respectively much higher than its population share (16.3 %) to the national total in the year 1994 as summarized in Table 1.20.

According to the Viet Nam Living Standards Survey (1992 to 1993), the number of households whose income category is over VND 10 million per month accounts for about 37.7 % in the North East South Region, while that of the national average is at only 12.4 % (refer to Table 1.21). On the contrary, the number of households with the income categories below VND 4 million is very large in South Central Coast and Central Highlands, accounting for 63.2 % and 56.3 % respectively.

1.3.2 Position in the National Spatial Development

The Study Area holds an important position in the national development as summarized below.

(1) More urbanized and more rapidly urbanizing region

The ratio of urban population to the total population or the urbanization ratio is as high as 40.3 % in the Study Area in the year 1993 mainly due to that of Ho Chi Minh City (74.0 %), the highest of all 53 provinces and cities (refer to Table 1.9). The Study Area contains 33.7 % of the total urban population in the country.

(2) Receiving area of spillover from HCMC and for in-migration from northern regions

The Study Area includes parts of migration receiving regions like the Central Highlands (Lam Dong), Mekong River Delta (Long An) and South Central Coast (Binh Thuan and Ninh Thuan). The organized migration projects and migration to new economic zones are actively promoted in these areas as endorsed by the number of migrant labourers of 15,205 persons in the year 1992 (refer to Table 1.22).

For such organized migration projects, about VND 266 billion was invested in the Study Area, accounting for 35.1 % of the total national fund for such projects. This is substantially larger than the territorial share of the Study Area at 14.7 % and indicates that the Area has a potential to capture and accommodate more migrants from the northern regions.

(3) More concentrated urbanization pattern

The Study Area is not only more urbanized, but its urbanization pattern is more concentrated. Three broad areas of urban population concentration may be identified: 1) Ho Chi Minh City (HCMC) itself, 2) areas leading to Bien Hoa and along National Highway No. 1, and 3) areas leading to Ba Ria-Vung Tau along National Highway No. 51 (refer to Figure 1.2). In addition to the above conurbations, Da Lat which is famous as a highland resort in the central highlands (Lam Dong province) also forms a relatively urbanized agglomeration.

The urban population of Ho Chi Minh City alone accounts for 28.0 % of the total in the Study Area. Next to Ho Chi Minh City, the core urbanized cities or towns in the Study Area are Bien Hoa, Vung Tau and Da Lat. The concentration of urban population and accumulated investments in Ho Chi Minh City and its satellite cities and/or towns are a predominant factor in the present spatial distribution of urban population and economic activities not only in the region but also in the country.

(4) Crossroads (or gateway) to Indochina countries

Another key for continued development of the Vietnamese economy is how to make effective use of emerging opportunities for economic interactions with the Indochina countries (especially Cambodia and Thailand). The Study Area is in a pivotal position to take advantage of these opportunities.

2. DEVELOPMENT POLICIES AND INSTITUTIONS

2.1 Regional and Water Resources Development Policies and Directions

2.1.1 Major Development Plans

Presently, there are two principal socio-economic development plans in Viet Nam; one is for short-term and the other is for medium-term up to the year 2000.

(1) Fifth five-year socio-economic development plan , 1991-1995

The Vietnamese Government is carrying out the Fifth Five-year Socio-economic Development Plan (1991-1995) as the short-term development plan with the following principal targets:

- i) to diversify and raise the production of staple and processed foods;
- ii) to increase the availability and choice of consumer goods; and
- iii) to expand exports.

Specific plan targets include achieving:

- | | |
|--|--------------------------------|
| - average annual economic growth rate | : around 5 - 6 % |
| - average annual industrial growth rate | : 6 - 7 % |
| - average annual agricultural growth rate | : 3.5 - 4.0 % |
| - projected exports
(with a substantial contribution from the petroleum sector) | : more than double |
| - reduction of population growth | : by 0.06 % points
per year |
| - average annual labour force growth rate
during the plan | : 2.75 % per year. |

The estimated total investment needs for the period covered by the Plan amount roughly to some US\$ 6 billion. External resource inflows are expected to total almost US\$ 5 billion.

Although many difficulties and constraints are still existent, Viet Nam's economic achievement in the first half of the year 1991 to 1995 five-year plan was relatively comprehensive and tangible. Those economic achievements affirm that Viet Nam has overcome the stage of stagnation, hyper-inflation and crisis, promising development momentum for taking-off.

(2) Socio-economic stabilization and development strategy to the year 2000

As a medium-term plan, there is the "Socio-economic Stabilization and Development Strategy to the year 2000" which sets out/determines the basic framework for the development of Viet Nam. The Strategy aims to:

- i) stabilize and develop socio-economy,
- ii) improve the people's living standard,
- iii) rid the country of poverty and underdevelopment, and
- iv) prepare basic conditions for a rapid development in the early 21 century.

This strategy has set people - as a community - into central position, i.e. the strategy for people and by people. The main targets to be reached are the following:

- annual GDP growth rate	:	7.5 %
- annual industrial growth rate	:	10 -12 %
- annual agricultural growth rate	:	4.0 - 4.4 %
- annual service growth rate	:	7.0 - 8.0 %.

To meet the targets of social, economic and cultural development up to the year 2000, total demand for investment capital is estimated at about US\$ 40 to 45 billion and 50 % of which is expected to be provided by foreign investment.

As an important general plan outlining a framework for action in environmental management and sustainable development for the nation, there is the "National Plan for Environment and Sustainable Development (NPESD), 1991-2000" prepared in the year 1991 by the State Committee for Science of Viet Nam with assistance of international institutions. This plan presents an ecologically sound and realistic basis for new development assistance and works as a backbone to approve the Environmental Protection Law.

(3) Sixth Five-Year Socio-Economic Development Plan, 1996-2000

The Vietnamese Government is preparing the next Sixth Five-Year Socio-Economic Development Plan to be put into execution from the year 1996 to 2000. During the next five years, Viet Nam plans to achieve high and sustainable growth at a rate higher than the previous five years so as to:

- fulfill the objective of doubling the year 1990 per capita GDP by the year 2000,
- bring the country out of poverty and under development,
- improve people's living standards, and
- increase domestic savings to get ready for stronger development in the 21st century.

Basic objectives and tasks set an annual GDP growth rate of 10 % with the target of each sector as follows:

- agriculture/forestry and fishery: 4.5 % to 5 %
- industry: 13 % to 14 %
- service: 12 % to 13 %.

By the year 2000, the share of industry in GDP will double that of agriculture, and the share of service will be 47 %.

2.1.2 Development Objectives and Basic Strategies

In the year 1993, Viet Nam's principal development goals were set forth by the then State Planning Committee (SPC), which is the current Ministry of Planning and Investment as discussed in subsequent Section 2.2, to pursue the following:

- Wide international partnership;
- Peace and prosperity; and
- Rapid economic growth.

The development objectives and basic strategies in key sectors and issues concerning regional socio-economic development are summarized as below.

(1) Agriculture and rural development

The characteristics of Viet Nam are unusually favourable for agriculture to play a lead role in development. In the agricultural and rural development sector, the strategic objectives to be pursued are based on the agriculture-led development strategy. They are to:

- raise the incomes of the mass of rural people;
- reduce rapidly absolute poverty in rural areas;
- contribute to a transformation of the economy by stimulating accelerated growth of output and employment in the low capital-intensity rural service and light industry sectors; and
- end the destruction of forests and its associated erosion, begin the process of enhancing the rural physical environment, and increase the input intensity in agriculture in a sustainable manner.

For the development of agricultural and rural sector, it is necessary to promote and accelerate the multi-lateral reforms and to concentrate investments on the following programmes/projects:

- Rehabilitation and expansion of irrigation facilities;
- Reorientation and rehabilitation of the agricultural research and extension system to address the technical needs of a sector based on millions of small farms;
- Continued strengthening of Viet Nam Bank for Agriculture so that it can mobilize rural savings for lending to farm households; and
- Development of the barren uplands on an environmentally sustainable basis.

(2) Industrial sector

A remarkable change taken place in the industrial sector during the time period of the year 1991 to 1993 was the rapid reorganization of state-owned enterprises. Currently, the Vietnamese government is carrying out the following renovations in the industrial sector in parallel with the supporting reforms in various fields:

- Pilot integration of many industrial enterprises into a big corporation to enable them to consolidate their international competitiveness; and
- Redefinition of the line ministries' functions and responsibilities to be responsible only for state management; no longer for production and doing business.

Besides, the expansion of labour-intensive light industry is viewed as a highly desirable option. To promote the growth of light industry, the strategy aims to:

- encourage both internal and external competition;
- continue reform of the state enterprise sector, corporatizing and privatizing a number of state enterprises;
- encourage small and medium size private sector enterprises;
- strengthen infrastructure support to light industry with particular attention to reliable energy sources, transport facilities and telecommunications;
- establish export processing zones and concentrated industrial centres to attract foreign investment, particularly for medium and small-scale industries; and
- others.

(3) Energy sector

Viet Nam has considerable indigenous primary energy potentials. Among others, the government is pressing ahead with the development of renewable energy sources, i.e. development of hydro-electric potential.

Key elements for the strategy of the country's energy development are:

- Institutional reforms to separate operating companies from energy ministries;

- Better energy pricing to promote efficiency and greater domestic resource mobilization; and
- Investments to ease the power shortage in the south in the immediate future and to meet growing nationwide demand in the medium term.

(4) Water resources development

The development strategy in water resources development is outlined in the "Irrigation and Drainage Development Strategy up to 2005", prepared in the year 1990 by the Institute of Water Resources Planning (IWRP), then Ministry of Water Resources, which is now the Ministry of Agriculture and Rural Development as discussed in subsequent Section 2.2.

In this strategy, water is considered as one of the most essential resources for socio-economic development; waters for agriculture, hydro-electric power, and industrial and domestic water supply. Concretely, the strategy of irrigation and drainage development aims to:

- appropriately reserve, control and utilize abundant water resources;
 - i) to meet water demand of the population in the whole country
 - ii) to effectively control floods
- protect the economy and people's life;
- contribute to development of 10 million ha of agricultural land for increasing croppings and diversification of crops (including fish and forest products); and
- ensure the most efficient development of abundant but limited water resources in accordance with the overall objectives of water utilization.

To reach the above objectives, the comprehensive irrigation and drainage development plan is worked out for each of seven regions based on the socio-economic development targets up to the year 2005.

(5) Social development

A number of integrated measures are now needed to reverse the crisis in the social sectors. The basic development strategy for human resources development is set out for:

- Expansion and improvement of primary education to provide quality service to children throughout the country;
- Improved quality of basic health services as well as better access to these services; and
- Strengthened provision of family planning services within the context of a renovated public health system.

Priority objectives of social development include:

- Increased and more stable nutrition levels;

- Reduced unemployment;
- More appropriate education;
- Reduced population growth;
- More equitable distribution of income and public services; and
- Strengthening of environmental management.

(6) Socio-economy: Population, labour and employment

The socio-economic stabilization and development strategy to the year 2000 in Viet Nam has set people - as a community - into central position: "strategy for people and by people". The weak state of the socio-economy has generally strong influence on people life: high population growth rate, shortage of employment, increase of unemployment and other social consequences.

Rational allocation of population as one of the objectives of socio-economic development strategy is to be carried out according to the following basic principles:

- a) Moving population from the regions with high density to the regions with low density but with rich resource potential, through making privileged advantages;
 - constructing infrastructure,
 - improving living conditions,
 - enacting the policies, and
 - creating an appropriate socio-economic environment that enables people to be sure to make a livelihood.

- b) Developing rural economy;
 - creating a lot of employment opportunities by promoting manufacturing industries, especially labour-intensive ones,
 - establishing step by step "green towns" in rural growth centres, paying more attention to natural environment,
 - developing goods circulation and markets in rural and remote areas, and
 - reducing the population emigration from rural areas to urban areas.

Although rational allocation of population through the country is in fact not simple nor easy because of big difference of life levels and living conditions between different regions, reasonably allocating population should be an objective required to implement in order to make most of potentials of the country for socio-economic development.

2.2 Institutions for Water Resources Development

The economic reform under the Doi Moi policy is being promoted in line with the following three specific objectives:

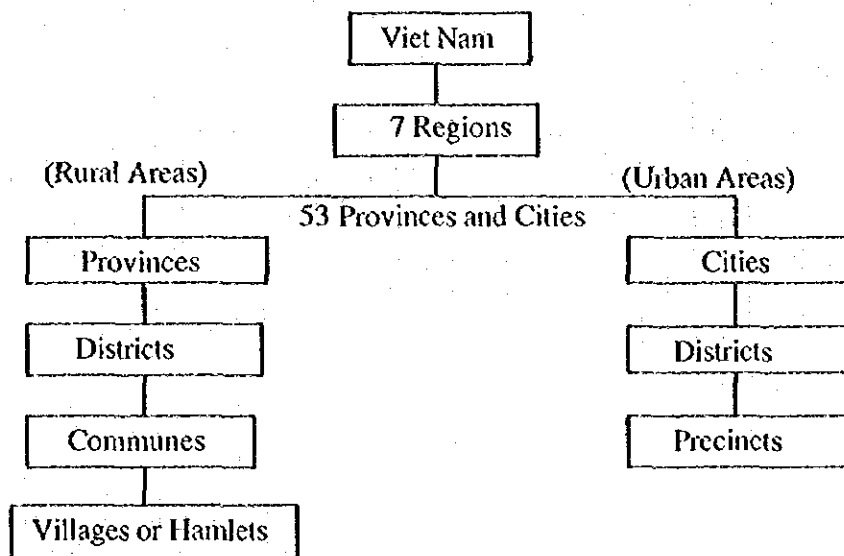
- a) Transfer of priority from heavy industries to agriculture, consumer goods and exports which are directly connected to daily life of the people;
- b) Substitution of the rigid and inefficient economic management (or planned economic mechanism) by one with a market-oriented economy; and
- c) Diversification of the international economic relations under the open door policy.

Viet Nam's renovation efforts have required reform of its administrative structures, economic management mechanism and social programmes. Laws and regulations still need to be further developed and made more consistent. Public administration has yet to be aligned with the needs of market-oriented economy.

2.2.1 Administrative System

Administratively, Viet Nam is divided into central and local levels. The latter comprises provinces with a relatively high degree of autonomy. Under the provinces, there are districts and communes. Large cities such as Ho Chi Minh City and Hanoi have the same status as provinces.

In the year 1990, the National Assembly approved a division of some previously merged provinces, and today the country is divided into seven regions and 53 provinces and cities with 467 districts and 9,670 communes as shown in the following administrative structure:



In terms of development, region can be treated as a spatial unit, and province similarly treated. Administratively, only province is treated as a unit, which is governed by Provincial People's Committee.

A commune extending over a distance of 5 to 12 km has 5 to 6 villages/ hamlets located at 1 to 4 km from each other on an average. A precinct has 5 to 6 blocks or population groups. The average population of a commune is 6,500 persons, and that of a block is 1,000 to 2,000 persons.

The population census in the year 1989 defines the urban and rural components of this administrative structure as shown below:

Administrative Unit	Urban Component	Rural Component
City (Thanh pho)	Quarter + District Town (Quan + Thi tran)	District (Huyen)
Town (Thi xa)	Ward (Phuong)	Commune (Xa)
District (Huyen)	District town (Thi tran)	Commune (Xa)

Source: Viet Nam Population Census, 1989

District towns are considered to be urban places only if they are the administrative or industrial centre of the district, they have a population of at least 2,000, and 50 % of their labour force is in non-agriculture. Furthermore, large cities and metropolis such as Ho Chi Minh City also have rural areas within their administrative borders.

In December 1991, some provinces previously merged by an administration reform were divided according to the resolution approved by the National Assembly. At that time, Thuan Hai province which is a part of the Study Area was divided into two provinces: Ninh Thuan and Binh Thuan.

Hanoi is the capital of Viet Nam, located in the north (Red River Delta Region), while Ho Chi Minh City is a large economic, cultural and commercial centre of Viet Nam, situated in the south (North East of South Region).

2.2.2 Laws and Regulations Related to Water Resources Development

(1) Water resources development

The previous laws on water resources development (river control, watershed management, etc.) were unclear and had not been successful in optimizing its use nor in preventing actions which waken the risk of water disaster.

In November 1994, new "laws on exploitation and protection of water resources schemes" were prepared in order to strengthen the efficiency of governmental management in exploiting, repairing and preserving water resources schemes for production and socio-economic development and consequently to contribute to the social safety and national security.

(2) Environment conservation

The environmental legislation, policies, standards and guidelines in Viet Nam are too much fragmented. There are four major pieces of government legislation that the Ministry of Science, Technology and Environment (MOSTE) has prepared and for which it is responsible as follows:

a) Environmental Protection Law

The "Environmental Protection Law" took effect in December 1993. This Law aims to:

- keep the environment pure and clean,
- improve/ensure ecological equilibrium,
- prevent/control adverse environmental influences caused by human beings and nature, and
- exploit/make reasonable and economical use of natural resources.

b) Prime Minister's Decree on Environmental Protection

The Environmental Protection Law is supported by periodic policy directives from the Office of the Prime Minister. The recent ordinance from the Office of the Prime Minister stipulates that all development projects must have an environmental impact assessment (EIA).

c) Guidelines for Environmental Impact Assessment (EIA)

The Guidelines for EIA stipulate the types for projects for which EIAs must be conducted as well as the environmental factors to be investigated in the EIAs.

d) Environmental Quality Standards

The Environmental Quality Standard is prepared for use in monitoring and inspection of projects and activities. These include standards for surface water, groundwater, drinking water, industrial waste water effluent and environmental quality in the workplace.

In addition to the above, there are a number of other pieces of existing or proposed government legislations and policies that are relevant to environmental protection and management. These are:

a) **Forestry Protection and Development Law**

The special areas were established in the year 1991 by the Forest Protection and Development Act for protection of national parks, natural reserves, forests for watershed conservation and so on.

b) **Mining Law (a draft under preparation by Ministry of Industry, MOID)**

c) **Industrial Waste Water Guidelines (a draft prepared by the IWRP-MOARD)**

d) **Sustainable Energy Policies**

This policy which is being implemented by the MOID concerns a programme of environmentally sustainable energy development. It deals with watershed management for hydropower projects, pollution from thermal power stations and renewable energy utilization.

On the other hand, some major cities and provinces have already formulated the local regulations on the environment against pollution by industrial and urban activities as principal targets. Ho Chi Minh City, Bien Hoa (industrial city adjacent to HCMC) and others have their own regulations under the control of each People's Committee or Environmental Committee.

(3) **Land and its use**

The Land Law enforced in the year 1993 provides that land use certificates will be issued for agricultural land and urban residential land and that these certificates can be sold, leased, inherited and mortgaged.

The government is still in the process to establish comprehensive and coherent land use policies. Laws and regulations related to water resources development are the following:

a) **Law on Environmental Protection (December 1994)**

b) **Water Quality Management Law (to control pollution by waste water)**

c) **Regulation on Environmental Pollution Control in HCMC (May 1993).**

2.2.3 Primary Ministries and Institutions for Water Resources Development

In October 1995, Viet Nam's National Assembly has approved a major government reorganization (or ministry reshuffle), and eight ministries and agencies were revamped to create the following three new ministries:

- a) Ministry of Agriculture and Rural Development (MOARD):
created from the merger of the former Ministry of Water Resources, Ministry Agriculture and Food Industry and Ministry of Forestry
- b) Ministry of Industry (MOID):
created from the merger of the former Ministries of Energy, Heavy Industry and Light Industry
- c) Ministry of Planning and Investment (MOPI):
formed from the merger of the former State Planning Committee (SPC) and State Committee for Cooperation and Investment (SCCI).

The resolution to revamp certain government agencies was approved in October 1995 by the deputies at the eighth session of the National Assembly, and a number of cabinet members have been appointed.

With Viet Nam's shift from centralized to market economy, this restructuring aims to separate the state management from production and business for the following two reasons:

- a) to enhance the role of state management and the macro management by ministries and
- b) to allow businesses to have independent finance, investment and marketing.

As a result of restructuring, ministries are now "state management bodies" and "General Corporations" newly established engage in business but not management activities. In total, 21 corporations were established for promotion in business. They can only acquire capital and are solely responsible for making a profit. To avoid evils of the monopoly status of a corporation, the Vietnamese government intends to prepare laws to encourage competition and establish at least two corporations in one industry.

Priorities are given to important industries like power that need to move ahead with their industrialization. The Viet Nam Power Corporation, one of 21 general corporations, takes charge of power industry development.

At present, the change appears only at the top level, and it is supposed that the substantial/real restructuring (merger) will be carried out gradually. In fact, the decrees of the Prime Minister issued thereafter to the ministries and institutions concerned state that such establishments are not allowed to dismiss, nominate, replace staff or to transfer capital and property until instructions are received from the National Assembly.

As such, this report describes the actual government structure by using both the former (old) and new organizational charts and names so as to make clear (explain) the process of changes as well as existing/transitional situations.

Many government agencies and institutions are related to water resources development and management. Figure 2.1 shows an organizational structure for water resources development in Viet Nam. The major agencies/institutions which are involving in the water resources planning and management are the following:

(1) Ministry of Agriculture and Rural Development (MOARD)

This Ministry was created by incorporating the former Ministry of Water Resources (MOWR), Ministry of Agriculture and Food Industry (MOAFI) and Ministry of Forestry (MOFO), and is responsible for managing surface water according to two basic strategies as follows:

- to stabilize and develop national economy mainly through agricultural development; and
- to manage industrial and domestic water and its quality.

The former MOWR (MOARD) is the national executing agency appointed as a counterpart of the JICA Team to undertake this Study. The organization charts of the MOARD and former MOWR are shown in Figures 2.2 (1) and 2.2 (2).

The Institute of Water Resources Planning (IWRP) under the former Ministry of Water Resources (MOWR) is the principal acting counterpart institution which will liaise/coordinate with the other government agencies and institutions for smooth implementation of the Study.

The new MOARD consists of seven (7) departments: Forestry Development, Population Distribution and Resettlement, Forest Control, Water Management and Irrigation Projects, Flood Control and Dyke Management, Plant and Herbal Quarantine and Aquaculture and Forestry Extension.

It is noted that in the reorganization, the social and resettlement issues were transferred to the jurisdiction of MOARD from the Ministry of Labour, War Invalids and Social Affairs (MOLWISA).

The former Ministry of Agriculture and Food Industry (MOAFI) had no direct responsibility in water resources development, but acted as one of the coordinating agencies to prepare an overall plan aimed at increasing in food crop outputs through application of integrated technology including use of better farm inputs and provision of sufficient irrigation water and effective drainage means. The organization chart of MOAFI is given in Figure 2.3.

The former Ministry of Forestry (MOFO) had overall responsibility for forest policy, planning and research. It had direct responsibility for 1.7 million hectares of forest land. However, most efforts of this Ministry had been placed upon forest production and business activities. After the establishment of MOSTE, the watershed management is mostly entrusted to this new agency. The remaining 12.3 million hectares of forest are under the provincial forest services.

(2) Ministry of Science, Technology and Environment (MOSTE)

The Ministry of Science, Technology and Environment (MOSTE) was created in October 1992, restructuring the former State Committee for Science and Technology. The main tasks of MOSTE are to:

- a) establish an environmental conservation system,
- b) prepare the Environmental Quality Standard on the national level,
- c) establish a monitoring system,
- d) develop manpower, and
- e) give technical opinions to investment plans as a member of Investment Cooperation.

The organization chart of MOSTE is given in Figure 2.4. In addition to the Ministry of Science, Technology and Environment (MOSTE), other agencies and institutions which are responsible for environmental issues are as follows:

- a) National Reserve Department (NRD)
- b) State Committee for Ethnic Affairs and Mountainous Regions (SCEAMR)
- c) General Department of Meteorology & Hydrology
 - Centre for management and control of atmosphere and water environment
- d) Ministry of Agriculture and Rural Development
 - Institute of Land Management
 - Institute of Plant Protection
 - Forest Inventory and Planning Institute
 - Institute of Forest Science
- e) Ministry of Public Health
 - Institute of Epidemiology
 - Institute of Occupational Health and Environmental Sanitation
- f) Ministry of Industry (MOID)
 - Environmental Protection Committee
- g) Viet Nam Power Corporation (the former General Company of Electricity of Viet Nam = EVN)
 - Institute of Energy
- h) Ministry of Labour, War Invalids and Social Affairs (MOLIWSA)
 - Research Institute of Labour Protection
- i) Ministry of Education and Training
 - Centre for Environmental Education
- j) Committee for Flood Protection
- k) General Department of Meteorology & Hydrology
- l) General Department of Land Administration
- m) National Centre for Social & Human Science

- n) National Reserve Department
- o) Institute for Tropical Technology and Environmental Protection of Viet Nam (VITTEP)
- p) Training and Centre for Eater Supply and Environmental Technology (CEFINEA)
- q) City and Provincial People's Committees
 - Department of Science, Technology and Environment
- r) Academic Institutions
 - Centres and Departments for Natural Resources Management and Environmental Studies or Environmental Engineering.

(3) Ministry of Industry (MOID)

This Ministry was established by incorporating the former Ministry of Energy (MOE) and the Ministry of Heavy Industry (MOHI) at the end of the year 1994.

Until the end of the year 1994, the former Ministry of Energy (MOE) was responsible for making the country's energy supply policies and was controlling three institutes and 12 companies in the energy sector. The organization chart of the former MOE is shown in Figure 2.5. This Ministry set production targets, allocated production and proposed selling prices, and determined foreign exchange requirements, capital investments and operating budgets.

Since the institutional arrangements in the energy sector were complex involving the former MOE as the largest ministry and other five functional ministries and several agencies, responsibilities for planning, pricing and foreign investment across the whole country economy fell under the jurisdiction of the former three State Committees, i.e. State Planning Committee (SPC), State Pricing Committee and State Committee for Cooperation and Investment (SCCI).

At the beginning of the year 1995, the then Ministry of Energy (MOE) was reorganized and its functions/responsibilities were divided into two; Ministry of Energy and General Company of Electricity of Viet Nam (EVN), by separating the state management to the former from production and business for the latter.

The former Ministry of Heavy Industry (MOHI) has authority over groundwater and other underground resources. This Ministry was once deeply involved in energy sector through its responsibility for oil and gas production, but after transfer of Petrovietnam under the Prime Minister in April 1992, its functions in this sector generally decrease.

(4) Vietnamese Power Corporation

The former General Company of Electricity of Viet Nam (EVN), which is the current Vietnamese Power Corporation (VPC), was established on the decision of Prime Minister no. 562/TTg dated Oct. 10, 1994. EVN with the juridical personality had the organizational structure consisting of Management Board, General Director/4 Deputy Directors and Member

Enterprises (Units) which are independently accounting state-owned enterprises, dependently accounting state-owned enterprises and non-production units.

"The Charter of the Organization and Operation of the General Company of Electricity of Viet Nam" stipulates the macroscopic institutional framework of the Electricity of Viet Nam (EVN) including its member enterprises and the guideline for scope of work (S/W) to be undertaken by EVN in the form of the government decree. The provision of the Charter is the first step to reform of power utilities on commercial principles. The organizational chart of EVN is given in Figure 2.6.

As a result of the restructuring at the end of the year 1995, EVN was renamed as "Viet Nam Power Corporation (VPC)", but its responsibilities/powers remain the same. Corporatization giving the enterprises an independent status and subjecting them to the legal requirements is still legally admitted to the new VPC by the said Charter.

(5) Ministry of Construction (MOC)

The Ministry of Construction (MOC) is responsible for urban water supply and sanitation. This Ministry is the leading agency in designing and implementing the urban infrastructures such as water supply and drainage & sewerage and in developing the sector policies. The organization chart of MOC is given in Figure 2.7.

The MOC also takes charge of project implementation through its design companies. The most important companies/institutions of MOC related to the water resources development are:

- Designing Company for Water Supply and Sewerage,
- Construction and Erecting Water Supply Companies,
- Provincial Construction Departments, and
- Institute for Urban and Rural Planning.

(6) Ministry of Planning and Investment (MOPI)

This Ministry was established by incorporating the former State Planning Committee (SPC), and is the leading agency responsible for preparing national plans and the Public Investment Plan (PIP), determining external assistance requirements and coordinating preparation of development project proposals.

Public Investment Plan (PIP) is a medium and long-term capital investment budget, in which SPC indicates the most efficient allocation of resources to achieve development objectives. MOPI is also designated responsibility for overall coordination of development assistance activities. Figure 2.8 shows the organization chart of the former SPC.

To sum up, the institutional framework for water resources development with the ministries/institutions concerned and their functions and responsibilities can be broadly defined as follows:

Agencies / Institutions	Functions & Responsibilities
1) Ministry of Agriculture and Rural Development (MOARD)	<ul style="list-style-type: none"> - Management of surface water (only water source) - Management of industrial-domestic water and water quality - Security of water sources for agriculture, hydropower generation, water supply, etc. - Stormwater and rainwater control - Irrigation and drainage - Forestry development and control - Population distribution and resettlement
- Institute of Water Resources Planning (SIWRP)	<ul style="list-style-type: none"> - Water resources planning for basins and zones - Formulation of water resources development investigation projects - Water resources management - Thematic studies on water resources
2) Ministry of Construction (MOC)	<ul style="list-style-type: none"> - Planning, design, construction and management of facilities for urban water supply, sanitation, urban roads, public light, etc. (As for the planning, design, construction and management of facilities for industrial water supply, each industry concerned is responsible for them)
3) Ministry of Industry (MOID) & Viet Nam Power Corporation (VPC)	<ul style="list-style-type: none"> - Electric power generation - Development of power industry - Development and management of groundwater and other underground resources
4) Ministry of Science, Technology and Environment (MOSTE)	<ul style="list-style-type: none"> - Environmental control and management (Water quality)
5) Ministry of Public Health (MOPH)	<ul style="list-style-type: none"> - Monitoring of water quality and hygiene
6) Provincial and City People's Committees	<ul style="list-style-type: none"> - Planning and management are decentralized to provincial institutions, which increase autonomy and responsibilities
- Water Resources Services	<ul style="list-style-type: none"> - Local water resources development
- Agriculture and Forestry Services	<ul style="list-style-type: none"> - Operation and management of irrigation schemes

3. CONSTRAINTS AND RECENT DEVELOPMENT UNDERTAKINGS

Including the "pivotal economic growth zone in the South", the Study Area has in general comparative advantages for socio-economic development in the country. This Section focuses on the constraints/problems to regional development, review of the recent development undertakings and presentation of some issues for regional development.

3.1 Constraints to Regional Development

3.1.1 General

In the Study Area, fundamental or general constraints which limit the growth of all sector activities might be attributed to the following:

- Weak macro-economic structure,
- Socio-economic distortions deriving from the transition to market economy,
- Natural disasters such as floods, droughts, salinity intrusion, etc.,
- Environmental degradation, and
- Insufficient infrastructures and energy and power shortages.

Thanks to the renovation efforts of Doi Moi policy, Viet Nam's macro-economic situation has greatly improved, and a positive investment climate has emerged. However, there are a number of development constraints to be overcome. Much remains to be done in order to rectify shortcomings and weaknesses that have existed in recent years.

In addition to the general constraints mentioned above, the specific constraints to regional development in each aspect/sector could be summarized as below.

3.1.2 Financial Constraints

Sound public finance is contingent on the good macro-economic management. Remarkable progress in this area is to be further pursued with tax reform to broaden the revenue base. The government revenue is mostly raised by the small number of state enterprises, representing more or less 70 % of the domestic revenue in the year 1993. However, most of them are facing serious financial and institutional constraints. At least one-third of its 12,000 enterprises are supposed to be bankrupt or on the verge of bankruptcy.

On the other hand, in order to improve the tax collection from the private sector, the government needs to simplify its complex system. Besides tax reform, there is also a need for budget reform, especially the expenditure controls, to make expenditure more transparent and identify expenditures that can be cut for making public fund sound.

3.1.3 Physical Constraints

The physical infrastructure on which the economy depends is generally weak. In the South, the main problem is that an adequate infrastructure base has not had proper maintenance. Weakness in the transport system in particular constraints domestic circulation of goods and supplies as well as import and export activities.

Shortage of electric power has become a serious constraint, especially acute in the South during the dry season when power is shut off several days a week, hampering the growth of various economic sectors.

Irrigation in the South represented by Mekong Delta is not so highly developed because this area has been settled more recently. Inadequacies in water management infrastructure seriously impede growth of agricultural outputs.

Some estuarine areas in the Mekong Delta and the Dong Nai River, which are the largest rice basket in Viet Nam, are suffering from salinity, acidity and water-logging. If sea water intrusion is prevented and fresh water flooding is better controlled, agricultural production in this area will sharply increase.

3.1.4 Socio-economic Constraints

Population in Viet Nam grows at a high rate of 2.1 % a year. Viet Nam faces difficulty to generate jobs opportunities so as to meet the population growth, causing sensitive unemployment and under-employment problems. Another issue to be strongly addressed is malnutrition and low calorie conditions which widespread throughout the country and result in decreasing the number of healthy manpower. To overcome the issues mentioned above, there is an urgent need to strengthen further agricultural production for improving nutrition condition and to promote agro-processing industry for creating job opportunities.

3.1.5 Difficulties in Land Use

There exist some difficulties in land use of mountainous and hilly areas mainly due to the following reasons:

- High erosion rate during the wet season;
In denuded areas, soil loss reaches 200 to 300 tons per hectare per year;
- Low moisture content during the dry season;
- Low humus content due to high erosion; and
- Poor soil structure with its high compactness.

Some areas in lowlands are vulnerable to floods, salinity intrusion, acidification and waterlogging. Areas fertilized by riverain silt are considered as fertile.

3.1.6 Institutional Problems

Viet Nam has begun the process of enacting the necessary laws and decrees in such areas as Environmental Protection Laws, Land Laws, Company Law, Contract Laws, Banking Laws and Foreign Investments Laws for economic development. Furthermore, the country revised its Constitution in the year 1992 to protect private property and to reorganize the important role of the private sector in the economy.

Main problems to be overcome in the institution for economic development however were and/or are still:

- Too many ministries are involved in energy policy without adequate coordination; and
- Ministries have both regulatory and operational responsibilities.

Companies under central and local governments need greater independence from line ministries, which should focus on policy and regulation.

In view of such circumstances, the resolution to execute a major government reorganization was unanimously approved in October 1995 by the National Assembly .

As to the structures and contents of the regulations formulated independently in each institution, they are sometimes in difference to each other, thus having no coordination among them. Besides, actual implementation on enforcement of the present regulations and monitoring seems to be less effectuated at the moment due to shortage of manpower, insufficient budget allocation, weak organizational back-up and so on.

Development administration is another factor for discussion. Decentralization and local autonomy are the key words here, but the question is how to substantiate them. Division of responsibilities may not be totally clear in some areas. Planning and management capacity is limited at the local government level.

Most of the responsibility for basic planning and management falls onto the Provinces. However, the Provinces rarely have well-trained experts in planning and management, and the work by the provinces is piecemeal.

3.1.7 Environmental Problems

The environmental problems in main sectors can be pointed out as follows:

(1) Agriculture sector

The Central Highlands lies at an average altitude of 1,000 m above the mean sea level, and the land is quite suitable for growing vegetables and perennial trees. However, deforestation due to the extension of land for cultivation as well as disorderly logging is causing negative impacts on environment.

The Mekong Delta constitutes the biggest rice production area in the country, but a major part of the area has saline and/or acid sulfate soils. Large seasonal variations of river flow have a decisive impact on fauna, flora, human habitat and living conditions in the delta.

(2) Forestry sector

Typical environmental issues of this sector are:

- Rapid decrease of natural forest,
- Development of the upland and sloping agricultural technology to sustain a livelihood (multi-story farming, inter-cropping, agro-forestry, integrated and bio-intensive farming, etc.),
- Widespread forest denudation by clearing, burning and decay, causing the erosion and soil loss, and
- Unstable plant rotation due to fluctuated demand and variable cost.

(3) Industry sector and urban problems

With the high pace of industrialization and urbanization, the problem of pollution is becoming serious in several industrial/urban areas. Contamination of water is the most important problem in these areas, both surface and groundwater.

Domestic and industrial water in and around Ho Chi Minh City (HCMC) is drawn from the Dong Nai River and groundwater. The Saigon River water is furthermore sought as a source of supply to HCMC. Water is used after treatment but there are three problems as follows:

- Salinity by sea water intrusion,
- Pollution by E. coli and other micro-organisms caused by insufficient treatment, particularly in newly developed economic zones, and
- shortage of water volume, even though rain water is used together.

3.2 Problem Structure of the Study Area

3.2.1 Problem Structure Analysis

The economic reform under Doi Moi has achieved numerous successful results, but the country is still experiencing many economic difficulties. Under such circumstances, the Study Area faces a variety of problems which would work as constraints to further development. Many of these problems are inter-related to cause various undesirable phenomena observed.

A problem structure analysis is a method to clarify these inter-linkages in a macroscopic way. The analysis would allow to maintain a broad perspective without getting into details to identify more important and essential factors and major problems to be alleviated through planned development efforts.

A problem structure in the Study Area is analyzed as illustrated in Figure 3.1, showing more important factors and phenomena and main inter-relationships among them. Main factors may be classified into two categories; external (macro-economic) and internal (regional socio-economic) factors. The first external factor is more fundamental, and much concerns the financial and national policy/institutional issues. This is largely beyond control at the regional level. The second regional socio-economy mainly concerns the natural/physical factors.

3.2.2 Main Factors Causing Problems

(1) Policy/institutional and financial factors

The main financial and policy/institutional factors consist of: 1) small state revenues, 2) large expenditures and 3) socio-economic distortions deriving from the transition to market economy.

The first factor among three is mainly due to the poor collection capability of taxes/levies and decrease of revenues from the state enterprises, while the second factor results from the huge subsidies and finances to the state enterprises, excessive current expenditures and increase of public investment needs for development. Both the above factors have caused financial deficits and constraints.

The third factor derives from accelerated reform processes which contain negative and unjust activities and consequently causes several macro-economic imbalances and distortions. It is important to note that this factor defines generally the regional development framework.

(2) Natural/physical factors

The main natural/physical factors identified in the Study Area are: 1) repeated natural calamities bringing about damages on natural and socio-economic infrastructures, 2) forest denudation and delay in forestation, 3) unfavourable farming conditions (like habitual floods, salinity intrusion and increase of acidity), 4) traditional agricultural cultivation, and 5) insufficient irrigation and drainage facilities.

It is true that compared to other regions in the country, the Study Area has much potentials and advantages, but much is needed to solve the above constraints and problems for ensuring more bright socio-economic development.

These problems have all serious implications to the Study Area. Other problems to be noted include malnutrition in some parts of the Study Area and widening regional disparities within the area. The malnutrition is a result, rather than a cause, of poor economic performance in poverty-stricken areas. In conclusion, the balanced and sustainable regional development is a "key issue" not only in the whole country but also within the Study Area.

3.2.3 Problem Interactions

Environmental degradation such as deforestation, urban and industrial pollution, dwindling wetlands and pollution of marine resources is progressing rapidly in Viet Nam. In fact, the problems/obstacles to natural resources development and environmental conservation are too much interacted and implicated in almost all sectors and aspects. It is pointed out that a number of problems/obstacles are attributed to the following:

- Insufficient planning capabilities for natural resources development and environmental conservation,
- Poor integration between conservation and development,
- Weak organization and lack of coordination among the authorities responsible for environmental conservation,

- Deficient and/or defective environmental legislation,
- Lack of reliable information and monitoring and management system,
- Lack of overall public awareness on environmental problems,
- Shortage of experienced manpower and investment,
- Relatively high population growth and population pressure, and
- Lack or loss of cultural taboos among the people of Viet Nam.

A typical environmental problem is the depletion of forest resources. The increase in cultivated area under crops in recent years is mainly at the expense of forest area as endorsed by the fact that the forest cover of Viet Nam has reduced from 44 % in the year 1943 to about 28 % in the year 1989. Whole areas are now devoid even of shrubs, partly because of defoliants being sprayed on the forests during the Viet Nam war, and partly through unwise land clearing and logging. It has been estimated that these activities have increased runoff by between 15 % and 40 %. This in turn has increased flooding, mud flows and sedimentation.

Environmental degradation of Viet Nam's uplands is threatening the sustainability of long-established agriculturally productive areas. Rehabilitation of important watersheds will allow a continuation of the steady improvement in agricultural production.

3.3 Recent Development Undertakings

3.3.1 Policy Directions for Development

To develop its economy successfully, the Government of Viet Nam is expected to provide a stable macro-economic environment as one of the public goods. The priorities for further macro-economic reform are:

- Tax reform to broaden the revenue base;
- Improved management of recurrent government expenditure; and
- Strengthening of core economic ministries through training and technical assistance.

Behind the recent economic success due to transition to market economy, the growing regional disparities are pointed out. There are poor and vulnerable groups who will be provided with little benefits from development.

Given the sharp regional disparities in income and living standards throughout the country, poor areas of the country will require significant investment in basic infrastructure such as roads to improve access to markets and irrigation to reduce seasonal variation of income.

An effective strategy for alleviating poverty in Viet Nam would require:

- Targeting of some infrastructure projects (especially in irrigation and transport) to poor areas that have good economic potential;
- Exemptions for poor groups as cost recovery measures are increased in education and health; and
- Central government financing of locally provided safety nets.

3.3.2 Development Programmes and Projects

In the Socio-Economic Development Strategy to the Year 2000, it is estimated that, in order to double actual GDP until the year 2000, the total investment requirements would amount to around US\$ 40 billion. According to its indicative breakdown, about half of this is expected to be financed from local (domestic) sources and the other remaining half from external ones.

The most immediate priority areas to seek external resources are in this order: 1) Economic infrastructure (US\$ 7.55 billion), 2) Social infrastructure (US\$ 1.83 billion) and 3) Technical assistance (US\$ 0.22 billion).

Table 3.1 shows core investment projects and programmes, specifically located in the Study Area and/or related to development of this area. For the time being, investment priority seems to be given to the axial economic growth zones which are expected to bring about high returns, in order to facilitate and support the development of other regions.

4. DEVELOPMENT OBJECTIVES AND BASIC STRATEGY

4.1 Regional Development Objectives

The problem structure analysis discussed in preceding Section 3.2 has clarified the following major problems to be solved/alleviated through planned development efforts:

(1) Macro-economic (policy/institutional and financial) factors

- i) small state revenues,
- ii) large expenditures, and
- iii) socio-economic distortions deriving from the transition to a market economy;

(2) Regional socio-economic/natural and physical factors

- i) repeated natural calamities bringing about damages on natural and socio-economic infrastructures,
- ii) forest denudation and delay in forestation,
- iii) unfavourable farming conditions (like habitual floods, salinity intrusion and increase of acidity),
- iv) traditional agricultural cultivation,
- v) insufficient irrigation and drainage facilities, and
- vi) water and power shortages during the dry season.

Development objectives for the Study Area are established to address to these problems/constraints, broadly in line with the existing development policies and directions outlined in preceding Section 2.1.

The objectives for the regional development of the Study Area are:

- a) To maintain economic growth at an appropriate level while sustaining economic and financial stability (considering the existing large regional imbalances and differences),
- b) To reduce inter-city/ provincial disparity by distributing fruits of economic growth to the depressed areas within the Study Area,
- c) To enhance the quality of land and water environment for environmentally sound and sustainable development, and
- d) To promote human resources development and upgrade living standard of the people through people's participation in regional development for socially viable development.

4.2 Contribution of Water Resources Development to Regional Development

The Study Area is relatively rich in water resources as far as the total endowments, i.e. mean annual rainfall of 1,945 mm in the Study Area, are concerned as presented in Appendix II, Meteorology and Hydrology. Seasonal variations of rainfalls, however, cause flooding in some areas, while other areas suffer from shortage of drinking and irrigation water supply during the dry season.

Flooding tends to be aggravated by deforestation and other inadequate land management. Groundwater is plentiful in most lowland areas of the Study Area, but its quality for drinking water has not been well established in some areas.

Issues of the water resources sector in the Study Area need the integrated development and management for more efficient use of limitedly available water resources. Necessary conditions for these would be comprehensive watershed management by river basin approach and more active participation of local people.

4.2.1 Development Objectives of Water Resources to Regional Development

As one of the three major constituents (land-water-people), water is critically important for the regional development. Water resources available in the Study Area will be developed to support the regional development as follows:

- a) To contribute to the increase in total electric power supply to support higher economic growth/industrialization and income generating activities in rural areas,
- b) To expand substantially the supply of water to support industries and other urban activities and to develop appropriate sources of water to assure decent quality of rural life,
- c) To develop water resources in designated localities where irrigation and/or tourism potentials are superior to enhance the quality of land and water environment, and
- d) To promote people's participation in water/hydropower resources development and management for efficient use of limitedly available water/hydropower resources.

4.2.2 Development Scenarios and Frameworks for the Master Plan Study

Three distinct alternatives might be envisioned for the development of the Study Area as follows:

- a) Trend development

This alternative represents the continuation of what has been taking place in the Study Area in the recent past.

b) Accelerated development

This alternative is to attain the highest economic growth placing emphasis on high industrialization/urbanization and border trade related services.

c) Balanced development

This alternative represents a well-controlled path between the first two alternatives, paying due attention to the balanced and sustainable regional development (not only the whole country but also with the Study Area).

Given the rich natural and human resources, the Study Area as a whole has recorded higher economic growth rates compared to the whole country. Besides, in view of its large potentials, the area is expected to continue to develop keeping more or less the presently enjoyed growth rates up to the target year 2015. However, it is apprehended, on the other hand, that such strikingly accelerated growth led by the Ho Chi Minh City area might skew the balanced and sustainable development and generate more large regional disparities/ differences. Thus, the third alternative, i.e. balanced development, seems to be the most desirable and realistic one. The development scenario in this master plan is further elaborated for this alternative.

The socio-economic framework for the balanced development alternative compared with the future growth rates set out in the national socio-economic development plans and other existing projections are shown in the following Table:

Proposed National Macro-Economic Framework and Projections

Sector	Viet Nam					Share of the Study Area (Balanced Dev.)
	1995	2000	2005	2010	2015	
Population (Thous.) (Growth rate)	74,285 (2.3 %)	83,230 (1.9 %)	91,443 (1.7 %)	99,485 (1.5 %)	107,173	16.4 - 18.0 %
GDP (Bil. VND, 1989 price)	43,166	61,970	95,348	140,098	196,495	40 - 48 %
GDP Growth Rate (%)	(7.5 %)	(9 %)	(8 %)	(7 %)		
- Agriculture	(10-12 %)					5 - 10 %
- Industry	(4.0-4.4 %)					40 - 50 %
- Service (Others)	(7.8-8.0 %)					40 - 55 %
Per capita GDP (VND per person)	581,080	744,561	1,042,706	1,08,237	1,833,431	

Sources: Socio-Economic Stabilization and Development Strategy to the Year 2000 and the Study Team's estimate

Notes: Figures in parentheses are the estimated growth rates between the years.

Figure 4.1 schematically shows the background and the conceptual development framework for water resources development by topographical zone in the Study Area.

4.2.3 Development Targets

In accordance with the above objectives and strategy, macro targets for the Study Area are set for the years 1995, 2005, 2010 and 2015 as shown in the following Table:

		Macro-Economic Targets of the Study Area					
		1993	1995	2000	2005	2010	2015
Population	Population (thousand)	11,406	12,026	13,726	15,484	17,290	19,089
	Annual Population Growth Rate (%)	(2.83 %)	(2.68 %)	(2.44 %)	(2.23 %)	(2.00 %)	
	% Urban Population	40.3 %	42 %	44 %	46 %	48 %	50 %
GRDP	GRDP (Billion VND at 1989 price)	14,694	17,458	25,651	41,312	63,653	93,396
	Annual GRDP Growth Rate (%)	(9 %)	(8 %)	(10 %)	(9 %)	(8 %)	
	% Changes by Sector						
	- Agriculture	10 %	10 %	8 %	7 %	6 %	5 %
	- Industry	50 %	50 %	45 %	43 %	42 %	40 %
- Service	40 %	40 %	47 %	50 %	52 %	55 %	
	Per capita GRDP (VND)	1,274,194	1,435,876	1,848,444	2,638,894	3,636,324	4,839,277

Source: HCA Team's estimates

Major considerations taken into account in target setting are as follows:

a) Population

As viewed in the world experiences, average population growth rate will be decelerated in a long term. Population is targeted to grow at rates of 2.68 % in the year 1995 to 2000, 2.44 % in the year 2001 to 2005, 2.23 % in the year 2006 to 2010 and 2.00 % in the year 2011 to 2015. At the target year 2015, the total population of the Study Area is estimated to reach approximately 19.1 million.

b) Gross Regional Domestic Product (GRDP)

Vietnamese economy is now growing fast at a rate of 8.4 % per annum during the time period of the year 1991 to 1993. The long-term macro economic projections by the World Bank and Vietnamese authorities indicate growth rates of 6.6 % to 12~13 % during the time period of the year 1995 to 2012 as most probable forecasts. Having these in mind, the economic growth in the Southern Region including Study Area is assumed at 8 % to 10 % for the time period of the year 1995 to 2015.

c) Per Capita GRDP

Per capita GRDP of the Study Area was VND 1,274,194 in the year 1993. This was higher than the national average of VND 517,522 by 2.46 times, and the gap has been widening. During the time period of the year 1995 to 2015, it is forecast that per capita GRDP growth of the Study Area will increase at an annual average of 6.26 % against 5.91 % of the national average.

5. SOCIAL ENVIRONMENTAL IMPACTS BY WATER RESOURCES DEVELOPMENT

5.1 Overview of Social Environment

In Viet Nam, almost 80 % of the people are based in the rural areas. Although most inland (marginal/border) areas are mountainous and sparsely populated, the people who will be affected by the water resources development projects may be those living in such areas.

5.1.1 Land Features

Social environment in an area is largely featured by the geographical and climatic conditions, land use and socio-economic activities in the region where it is located. The Study Area covers both parts of the Central and the South, when the country is divided into three parts; north, central and south.

The southern half of the Central includes the northeast part of the plain extended downstream of the Dong Nai River. Da Lat which is famous as highland resort is located in the extreme north-east of the Study Area. Geographical approach from mountains to seashores provides a contrast and variety of scenery; clear blue sea water and white silica sand.

The southern part is a vast alluvial plain (Mekong Delta) with fertile soil formed by the Mekong River, and thus a rich harvest can be expected when a draining system is well established.

The southern part of Viet Nam lies in the monsoon climate zone with dry and wet seasons. Average annual rainfall falls in the range of 1,800 to 2,000 mm, whilst mountain areas in the upper reaches of the Dong Nai River collect more rainfall in the rainy season, but less in the coastal area. Relative humidity is more or less 80 % on an annual average.

The forest area in the Study Area accounts for 19.3 % of the country's total as shown in Table 5.1. This figure is slightly larger than 14.6 %, which is the share of land area. The ratio of forest coverage to natural area is relatively high in Dac Lac (67.1 %), Lam Dong (62.6 %), Binh Thuan (54.6 %) and Ninh Thuan (46.2 %) in the year 1993. The smallest ratio of forest coverage is observed in Long An province (2.0 %), followed by Ho Chi Minh City (10.8 %).

Currently, great care is needed to exploit this forest potential on a sustainable basis. These forests play an important role in fostering biodiversity, in containing soil erosion, in preserving water, in mitigating floods and in maintaining the micro-climate.

The national parks, nature reserves and scenic sites in the Study Area, including even those being proposed or recommended by the Ministry of Agriculture and Rural Development and others, are summarized as follows:

Protected Areas	Provinces	Area (ha)
1. National Parks		
1) Con Dao	Ba Ria-Vung Tau	6,000 ha
2) Nam Bai-Bat Tien & Bai Cat Tien (Proposed MAB reserve)	Dong Nai & Song Be	90,000 ha
2. Nature Reserves		
1) Phan Rang	Thuan Hai	1,000 ha
2) Duc Linh / Thanh Linh / Bien Lac	Thuan Hai	17,000 ha
3) Ka Kon Son Mao	Thuan Hai	20,000 ha
4) Yok Don (Proposed to upgrade to national park)	Dac Lac	58,000 ha
5) Cho Giang Sinh & Nui Ba	Dac Lac & Lam Dong	156,000 ha
6) Nam Lung	Dac Lac	20,000 ha
7) Ea Sup	Dac Lac	30,000 ha
8) Thuong Da Nhim	Dac Lac	7,000 ha
9) Nui Dai Binh	Lam Dong	5,000 ha
10) Bu Gia Map	Song Be	26,000 ha
11) Lo Go Sa Mat	Tay Ninh	10,000 ha
12) Binh (Huynh) Chau Phuoc Buu	Dong Nai	5,476 ha
3. Scenic Sites		
1) Da Lat	Lam Dong	42,500 ha
2) Nui Ba Den	Tay Ninh	2,000 ha
Total		495,976 ha

Source: Study on the Present Status of Environment, March 1994, OECC & MOSTE

The total protected areas, consisting of two national parks, 12 nature reserves and two scenic sites cover about 4,960 km², corresponding to about 21 % of the country's total protected areas. As species to be protected including endangered ones in the country, 54 species of mammals and 60 species of birds are listed by the Ministry of Agriculture and Rural Development. However, there is at present no enforcement of the regulations regarding protected species.

5.1.2 Socio-environmental Features of the Study Area

According to the data in the year 1993 to classify population by urban and rural, 40.3 % of people in the Study Area live in the urban area, while 59.7 % are in the rural area. Compared with the national average of 19.5 %, the urbanization rate in the Study Area is excessively high exclusively due to the highest rate of 74.0 % in Ho Chi Minh City, the megalopolis in Viet Nam along with Hanoi.

Broadly speaking, there exists a remarkable contrast between the urbanized region covering Ho Chi Minh City including its surrounding areas and the marginal/rural depressed region. This indicates that there are also various regional imbalances in this area and thus that the need for balanced regional development is important.

Table 5.2 shows the main source of lighting by region. According to this Table, about 62 % of households in the North East of South Region consisting of Ho Chi Minh City, Song Be, Tay Ninh, Dong Nai and Ba Ria-Vung Tau provinces use electricity for lighting. However, in two regions, i.e. Central Highlands and Mekong River Delta, which partly belong to the Study Area, the percentages using electricity for lighting are as small as 21.1 % for the former and 25.5 % for the latter and far below the national average of 48.6 %.

Seen in terms of the type of agricultural land by region, annual crops are prevalent in the South Central Coast and Mekong River Delta regions, accounting for 88.0 % and 82.1 % respectively as seen in Table 5.3. On the contrary, the percentages of perennial crops are relatively large in the Central Highlands and North East South, reaching 35.0 % and 25.2 % in the respective regions.

As for the medical situation in the Study Area, people dwelling in the urban areas are much enjoying better social infrastructure (facilities) and services. The population per doctor and per nurse is by far better in Ho Chi Minh City (refer to Table 5.4). Besides, it is noticeable that the medical condition is closely related to that of transport and communications in each area, corresponding to the distance and/or access from the big city and towns.

The Viet Nam Living Standards Survey (the year 1992 to 1993) indicates that the national average of per capita income is about VND 1,107 thousands per year (refer to Table 5.5). The highest annual per capita income is VND 1,892 thousands in the North East of South, followed by VND 1,265 thousands in Mekong River Delta. Those in the South Central Coast and Central Highlands are VND 854 thousands and VND 861 thousands respectively, much lower than the national average of VND 1,107 thousands.

The State Committee for Ethnic Affairs and Mountainous Regions and attached government agencies are responsible for the well-being of rural people, especially minority ethnic groups living normally in the depressed areas.

It is noteworthy that the Vietnamese people are generally not restrained in their consumption of natural resources for food and other purposes by the dictates of religious, moral or traditional taboos. It is said that the great respect, which previous generations showed for the balance of natural forces and all living things including the forest spirits, has been lost or forgotten as a result of the terrible social upheavals that took place during 30 years of war and because of the sharp demands of the growing population for more immediate production.

5.1.3 Ethnic Groups

Table 5.6 shows the major ethnic groups by province in the Study Area. Ethnic Vietnamese (Kinh) occupies about 90 % of the total population, well spreading over the Study Area. The second largest group is Hoa (Han), accounting for 5.8 % of the total population. Over 90 % of them dwell concentratedly in Ho Chi Minh City and Dong Nai province. The remainder consists of major 25 minority groups, generally living in the mountain areas.

The major minority ethnic groups specifically rooted in the Study Area are extracted from Table 5.6 as follows:

	Population in the Study Area	Agglomerated Provinces	% of Country Total
- Hoa (Han)	590,201	HCMC & Dong Nai	65.6 %
- Co Ho	70,231	Lam Dong & Thuan Hai	76.2 %
- Cham	70,541	Thuan Hai & HCMC	71.3 %
- Ra-glai	45,158	Thuan Hai	63.0 %
- Xtieng	50,048	Song Be	99.7 %
- Ma	16,685	Lam Dong	65.6 %
- Cho-ro	14,987	Dong Nai	99.8 %
- Chu-ru	7,980	Lam Dong	74.3 %

Note: Thuan Hai was divided into Binh Thuan and Ninh Thuan provinces in the year 1991.

Source: Viet Nam Population Census - 1989

Most of ethnic minority tribes live in the marginal highlands keeping their own living style and customs which are well traditionally refined. According to the diversity of natural environments and ecological conditions given in each area, they establish a great diversity of socio-economic life and develop specific livelihood with many variations in land use practice.

5.2 Eventual Socio-environmental Effects by Water Resources Development

5.2.1 Environmental Degradation and Sustainable Development

The Vietnamese Government has encouraged the migration of the Kinh people (ethnic Vietnamese) from their native lowlands to "new economic zones" in the highlands. However, such migrations have not been implemented with a shift in proper farming practices suitable for the ecosystem in the new areas. In most of cases, inappropriate farming techniques and over-exploitation system have been brought from the lowlands to the highland resettlement areas.

Ethnic groups have traditionally practiced slash-and-burn farming in the mountainous areas for centuries. This can involve progressive deforestation of a family farm lot, cultivating for 3 to 10 years, followed by a long period of fallow before a return to cultivation.

This farming practice is largely sustainable and caused little lasting damage to the productivity or stability of forest ecosystems. However, it accompanies a risk to result in increased and unsustainable burden on the land, when the period of fallow is decreased due to population pressure and exhaustive exploitation.

From the standpoint of water resources development, it is essential to stop/minimize as much as possible the environmental degradation like deforestation and soil erosion, because soil erosion in the river catchments is not only reducing the storage capacities of major dams and reservoirs, but also causing excessive siltation in agricultural zones in the lowlands.

In these areas, a sustainable socio-economic development system needs to be developed by paying due attention to the balanced ecosystem, especially three major constituents for regional development, i.e. land - water - people.

5.2.2 Dam Projects and Resettlements

As discussed in Appendix X, a total more than 10 projects are selected as master plan projects of this study to discuss in more detail. Among them, four reservoir projects are included. Displacement of people in the proposed reservoir area is one of serious issues to be settled in the social environment.

In Phase III of this Study, Initial Environmental Examination (IEE) was carried out for the selected master plan projects including three reservoir projects. For socio-environmental aspects of this IEE, the questionnaire and interview surveys were conducted based on the internationally recognized guidelines and forms. The results are discussed along with the IEE study for natural environment in Appendix IV.

5.3 Basic Principles for Socio-environmental Development

Since resettlement is inherently a complex and difficult topic, the following are described to confirm the basic principles for eventual resettlements subsequent to the project implementation in the Study Area.

Since more attention has focused on the social impact of some of the large dam schemes, a considerable amount of criticism has been directed towards not only the implementing agency but also lending agencies in recent years. In particular, it happens that inadequate provision is sometimes made for the resettlement of the large numbers of people who are displaced by the projects.

There is no doubt that the submergence of land by a reservoir causes major economic losses and socio-cultural disruption. Farming systems are dismantled, arable lands and forest are lost, land improvements disappear and so on. As a result, many small and medium-scale farmers and other traders are impoverished.

In fact, there have been insufficient efforts to minimize the human and economic costs, particularly to avoid or minimize people's displacement, to mitigate the unavoidable short-term impact of the resettlement, and to prevent long-term marginalization and destitution.

To evaluate whether or not the proposed resettlement plan will actually work, it is required to justify the following:

- a) whether or not the property to be destroyed by the project has been adequately inventoried and valued;
- b) whether or not suitable land has been identified which will be available and accessible to the resettlers;
- c) whether or not the development package and the compensation are adequate to ensure the socio-economic re-establishment of the people affected; and
- d) details of the organizational arrangements for resettlement.

This involuntary resettlement policy rests on a number of basic principles about government responsibility, resettler rights, protection of host population interests, environment protection and a clear definition of re-establishment objectives. The basic principles for resettlement internationally recommended are the following:

- In all cases where a project causes resettlement, the project should ensure that the displaced people regain at least their previous living standards.
- Resettlement operations should not only return resettled populations to their former living standards, but also that, whenever possible, they should improve peoples' welfare in environmentally sustainable ways.
- In short, the resettlement policy aims to create circumstances in which the people negatively affected by a project can also share in some of its benefits.