

**Japan International Cooperation Agency  
Ministry of Agriculture and Rural Development  
The Socialist Republic of Vietnam**

**The Study  
on  
Nationwide Water Resources  
Development and Management  
in  
the Socialist Republic of Vietnam**

**Final Report**

**Volume VII**

**Supporting Report**

**Phase 2-2: Integrated River Basin Management  
Plan for the Kone River Basin**

**Phase 2-3: Feasibility Study on Priority  
Projects for the Kone River Basin**

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**Nippon Koei Co., Ltd.  
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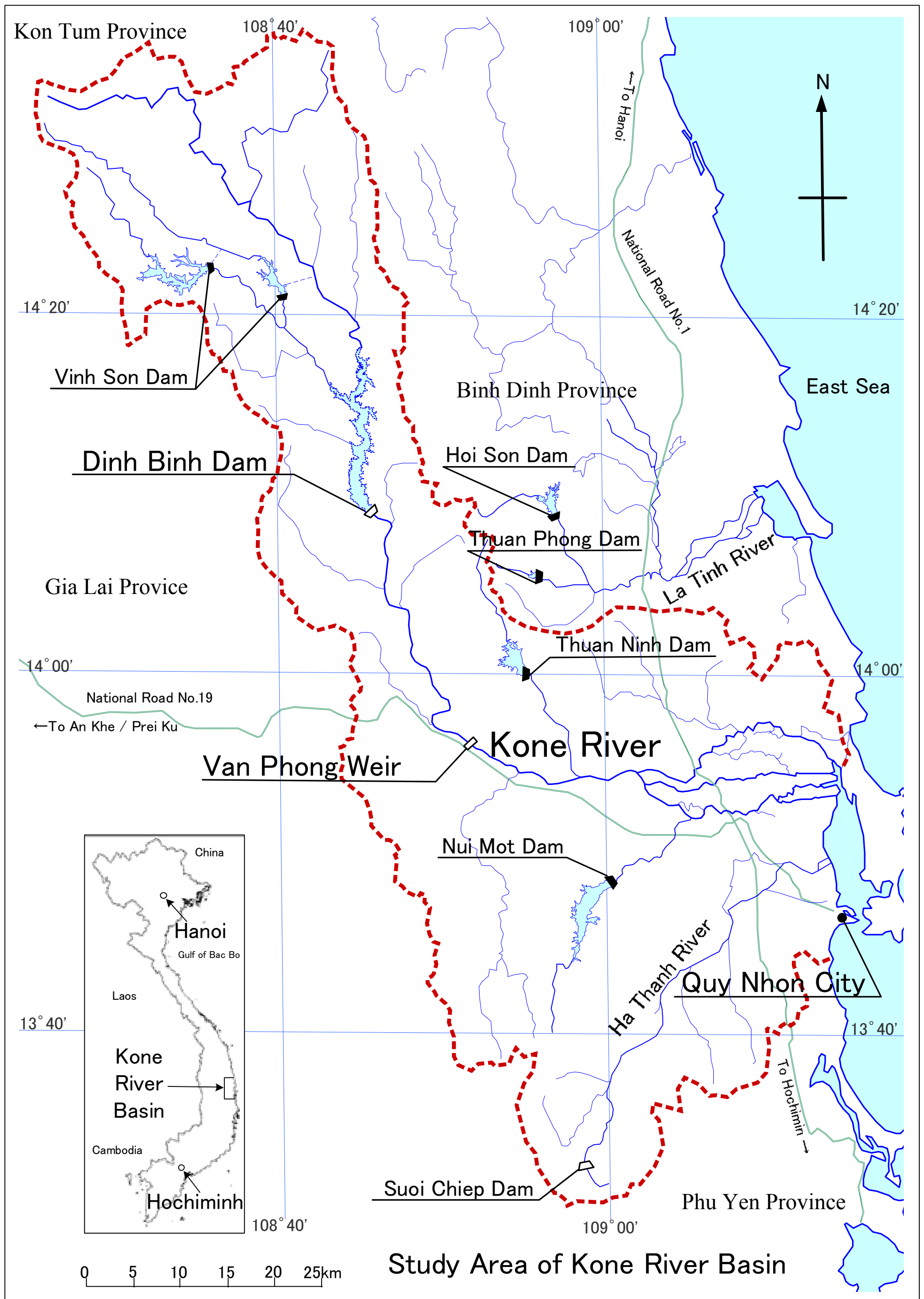
## **COMPOSITION OF FINAL REPORT**

<b>Volume I</b>	<b>Executive Summary</b>
<b>Volume II</b>	<b>Phase 1, Main Report</b>
<b>Volume III</b>	<b>Phase 2-1, Main Report</b>
<b>Volume IV</b>	<b>Phase 2-2, 2-3, Main Report</b>
<b>Volume V</b>	<b>Phase 1, Supporting Report</b>
<b>Volume VI</b>	<b>Phase 2-1, Supporting Report</b>
<b>Volume VII</b>	<b>Phase 2-2, 2-3, Supporting Report</b>
<b>Volume VIII</b>	<b>Data Book</b>

### Exchange Rates

US\$ 1 = Vietnamese Dong 15,068  
Yen 100 = Vietnamese Dong 12,212

As of December 3, 2001



THE STUDY  
ON  
NATIONWIDE WATER RESOURCES DEVELOPMENT AND MANAGEMENT  
IN  
THE SOCIALIST REPUBLIC OF VIETNAM

FINAL REPORT

Phase 2-2,2-3: Supporting Report

Composition

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## Abbreviations

### 1. Organization

ADB	: Asian Development Bank
AFD	: Agence Française de Développement
AusAID	: Australian Agency for International Development
BARD	: Bank of Agriculture and Rural Development
CWRET	: Center of Water Resources and Environment Technology
DANIDA	: Danish International Development Assistance
DARD	: Department of Agriculture and Rural Development
DOSTE	: Department of Science, Technology and Environment
DSI	: Development Strategy Institute
EPRI	: Electric Power Research Institute
EVN	: Electricity of Vietnam
ESCAP	: United Nations Economic and Social Commission for Asia and the Pacific
FAO	: Food and Agriculture Organization
FPD	: Forest Protection Department
GSO	: General Statistical Office
HEC 1	: Hydraulic Engineering Consultants Corp. No.1
HMS	: Hydro Meteorological Service
IBRD	: International Bank for Reconstruction and Development
ICD	: International Cooperation Department
IUCN	: International Union for Conservation of Nature and National Resources/ World Conservation Union
ISG	: International Support Group
IFEP	: Institute of Fishery Economics and Planning
IWRP	: Institute of Water Resources Planning
IWRR	: Institute of Water Resources Research
JBIC	: Japan Bank for International Cooperation
JICA	: Japan International Cooperation Agency
MABR	: Man and the Biosphere Reserve
MARD	: Ministry of Agriculture and Rural Development
MOF	: Ministry of Fishery
MOH	: Ministry of Health
MONRE	: Ministry of Natural Resources and Environment
MOSTE	: Ministry of Science, Technology and Environment
MOTC	: Ministry of Transport and Communication
MPI	: Ministry of Planning and Investment
NEA	: National Environmental Agency
NGO	: Non-governmental Organization
NIAPP	: National Institute of Agricultural Planning and Projection
NWRC	: National Water Resources Council
PC	: People's Committee

PECC2	: Power Engineering and Consulting Company No.2
SBV	: State Bank of Vietnam
UN	: United Nations
UNDP	: United Nations Development Programme
UNESCO	: United Nation Educational, Scientific and Cultural Organization
USDA	: United States Department of Agriculture
VNMC	: Vietnam National Mekong Committee
WB	: World Bank (International Bank for Reconstruction and Development)
WHO	: World Health Organization
WWF	: World Wide Fund for Nature

## **2. Unit**

MW	: mega-watt	km	: kilometer
kW	: kilo-watt	km <sup>2</sup>	: square kilometer
MWh	: mega-watt hour	ha	: hectare
kWh	: kilo-watt hour	mile <sup>2</sup>	: square mile
GWh	: giga-watt hour	m <sup>3</sup>	: cubic meter
GWh/yr	: giga-watt hour per year	m <sup>3</sup> /year	: cubic meter per year
kV	: kilo volt	m <sup>3</sup> /sec, m <sup>3</sup> /s	: cubic meter per second
MVA	: mega-volt ampere	m <sup>3</sup> /sec/km <sup>2</sup>	: cubic meter per second per square kilometer
mm	: millimeter	feet <sup>3</sup> /sec/miles <sup>2</sup>	: cubic feet per second per square mile
mm/day	: millimeter per day	g	: gram
mm/year	: millimeter per year	mg/l	: milligram per liter
m	: meter	Mm <sup>3</sup>	: million cubic meter
m/s or m/sec	: meter per second	MCM	: million cubic meters
m/sec <sup>2</sup>	: meter per square second		

## **3. Currency**

VND	: Vietnamese Dong
US\$	: US Dollar
JPY	: Japanese Yen

## **4. Others**

AC	: Alternating Current
BOD	: Biochemical Oxygen Demand
C.A.	: Catchment Area
C-Cycle	: Combined Cycle
CHES	: Cultural and Historical Environmental Site
COD	: Chemical Oxygen Demand
CPI	: Consumer Price Index
DO	: Dissolved Oxygen
DP	: Dynamic Programming
EGEAS	: Electric Generation Expansion Analysis System
EIA	: Environmental Impact Assessment

EIRR	: Economic Internal Rate of Return
FC	: Foreign Currency
FDI	: Foreign Direct Investment
F.M.	: Finess Modulus
FIRR	: Financial Internal Rate of Return
FSL	: Full Supply Level
FWL	: Flood Water Level
GDP	: Gross Domestic Products
GNP	: Gross National Products
GRDP	: Gross Regional Domestic Products
HCM	: Ho Chi Minh
HCMC	: Ho Chi Minh City
HPP	: Hydropower Project
ICB	: International Competitive Bid
IEE	: Initial Environmental Examination
IPP	: Independent Power Producer
LC	: Local Currency
LCB	: Local Competitive Bid
LEP	: Law on Environmental Protection
LOLP	: Loss of Load Probability
LRMC	: Long Run Marginal Cost
MDD	: Maximum Dry Density
MIT	: Massachusetts Institute of Technology
MOL	: Minimum Operation Level
NGO	: Non-Governmental Organization
ODA	: Official Development Aid
OMC	: Optimum Moisture Content
PMP	: Probable Maximum Precipitation
RAC	: Resettlement Action Committee
RAP	: Resettlement Action Plan
RBO	: River Basin Organization
ROE	: Return on Equity
SCF	: Standard Conversion Factor
SGS	: Streamflow Gauging Station
SME	: Small and Medium Enterprises
SRMC	: Short-Run Marginal Cost
SS	: Suspended Solids
UFW	: Unaccounted For Water
VAT	: Value Added Tax
WASP	: Wien Automatic System Planning Package

## **Appendix A**

### **Socioeconomic Condition**



# Appendix A

## Socioeconomic Condition

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## **Appendix A Socioeconomic Condition**

### **1 ADMINISTRATION**

The Socialist Republic of Vietnam (Vietnam) occupies the easternmost part of Indochina and is bordered by China on the north, by the Gulf of Tonkin on the east, by the South China Sea on the southeast, by the Gulf of Thailand on the southwest, and by Cambodia and Laos on the west. The country has a total area of 329,241 km<sup>2</sup>. Vietnam is administratively divided into 57 provinces and 4 municipalities (Hanoi, Hai Phong, Ho Chi Minh City, and Da Nang).

The study area, Kone River Basin is located in the south central region of Vietnam and its basin area is 3,640km<sup>2</sup>. The Kone River rises in the northeastern part of Gia Lai Province, in the Southern Truong Son Range, and it flows through Binh Dinh Province from the northwest to the southeast and pours into Thi Nai Swamp. Major part of Kone River Basin is situated in Binh Dinh Province (about 90%).

The province has an area of 6,026km<sup>2</sup> and consists of the capital city, Qui Nhon, and other 10 districts of An Lao, Hoai An, Hoai Nhon, Phu My, Phu Cat, Vinh Thanh, Tay Son, An Nhon, Tuy Phuoc, and Van Canh. The city and districts are further divided into 126 communes.

## 2 POPULATION AND LABOR FORCE

### 2.1 Population

Total population of Vietnam is 78,686 thousand in 2001, yielding a population density of about 239 persons per sq. km. The urban population was 19,481 thousand (24.8%) and the rural population was 59,205 thousand (75.2%). The total population increased by 11.44 million during 10 years from 1991 to 2001 with an average annual increase of 1.6%. Increase of urban population is high at 3.9%/year and that of rural population is relatively low at 0.9%/year due to urbanization.

Average population of Binh Dinh Province is 1,504,700 in 2001. Urban population is 362,700 (24.1%) and rural population is 1,142,000 (75.9%), which are almost the same ratio as the national average. Average annual growth rate of the population is 1.3% during six years from 1995 to 2001. Rapid urbanization is underway in the province. Annual growth rate of urban population is 5.4% while that in rural population is 0.2% in the same period.

**Average population of Binh Dinh Province (1,000 persons)**

	1995	1996	1997	1998	1999	2000	2001	Ave. annual increase (%)
Population (1,000)	1,394.3	1,412.9	1,431.4	1,449.8	1,468.0	1,485.6	1,504.7	1.3
Male	673.9	683.6	693.4	703.1	712.8	721.1	730.4	1.4
Female	720.4	729.3	738.0	746.7	755.2	764.5	774.3	1.2
Urban	265.2	272.1	279.1	345.8	352.0	357.6	362.7	5.4
Rural	1,129.1	1,140.8	1,152.3	1,104.0	1,116.0	1,128.0	1,142.0	0.2
Proportion (%)								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
Male	48.3	48.4	48.4	48.5	48.6	48.5	48.5	-
Female	51.7	51.6	51.6	51.5	51.4	51.5	51.5	-
Urban	19.0	19.3	19.5	23.9	24.0	24.1	24.1	-
Rural	81.0	80.7	80.5	76.1	76.0	75.9	75.9	-

Source: Statistical Yearbook of Binh Dinh Province 2001

The Kone River Basin consists of 9 districts and 97 communes including irrigation extension areas. The total population of the Kone River Basin is 1,027,800 as of 2001 and its population density is 262 persons/km<sup>2</sup>. The most densely populated area is the capital city, Quy Nhon, and its population density is 1,150 people/km<sup>2</sup>. If the average family size is still the same as that at 1999 Census, the number of households in the river basin is estimated to be 224,040. Population in the river basin by commune is shown in Table A.1 and summarized below:

**Average population and Number of Households in Kone River Basin**

No.	District	No. of commune	Area (km <sup>2</sup> )	Population in 2001 (1,000)	Population density (pers./km <sup>2</sup> )	No. of household (household)	Family size (pers/hh)
1.	Quy Nhon city	19	213.0	244.9	1,150	52,410	4.7
2.	An Lao	1	260.4	0.5	2	90	5.8
3.	Phu My	6	170.4	73.1	429	16,080	4.5
4.	Phu Cat	14	549.6	156.6	285	34,240	4.6
5.	Vinh Thanh	7	700.8	26.4	38	5,610	4.7
6.	Tay Son	15	708.0	133.2	188	29,160	4.6
7.	An Nhon	15	242.2	184.9	763	41,670	4.4
8.	Tuy Phuoc	14	284.9	186.1	653	39,980	4.7
9.	Van Canh	6	798.0	22.1	28	4,810	4.6
Total		97	3,927.1	1,027.8	262	224,040	4.6

Source: Statistical yearbook of each district 2001

The annual population growth rates of the districts are 1.4% for Quy Nhon, Phu Cat, Vinh Thanh, and Van Canh, 1.3% for An Lao, Phu My, Tay Son, and Tuy Phuoc, and 1.1% for An Nhon during six years from 1995 to 2001

## 2.2 Labor Force

The labor force population of Binh Dinh Province was 742,800 people according to 1999 Census. Out of this, the working population was 708,200 people (95.4%) and unemployment rate was 4.6%. In rural area, unemployment rate is lower since agricultural sector absorb labor force. Conversely, in urban area like Quy Nhon, the rate is high at 10.8%.

**Economically Active Population in 1999 (1,000 persons)**

No.	District	Population aged 13 and over	Economically non-active	Economically active			Unemployment ratio (%)
				Working	Unemployed	Total	
1.	Quy Nhon city	176.3	69.2	95.5	11.6	107.1	10.8
2.	An Lao	15.1	3.8	11.1	0.2	11.4	2.1
3.	Hoai An	148.9	40.8	103.0	5.2	108.1	4.8
4.	Hoai Nhon	61.6	14.2	46.5	0.9	47.4	1.9
5.	Phu My	120.5	31.2	86.9	2.4	89.3	2.7
6.	Phu Cat	16.9	4.3	12.6	0.1	12.6	0.6
7.	Vinh Thanh	125.6	30.6	92.9	2.2	95.0	2.3
8.	Tay Son	91.5	21.6	67.4	2.4	69.8	3.5
9.	An Nhon	129.7	33.5	91.6	4.6	96.2	4.8
10.	Tuy Phuoc	126.1	31.0	90.7	4.4	95.2	4.6
11.	Van Canh	14.0	3.3	10.2	0.5	10.7	5.0
Total		1,026.3	283.6	708.2	34.5	742.8	4.6

Source: Population census 1/4/1999, Department of Statistics Binh Dinh Province

Agriculture and forestry sector employs 69% of working population, while fishery, mining, manufacturing & construction, and other including service sector employ 4.4%, 1.1%, 9.7% and 16%, respectively. In rural areas, the ratio of working population in agricultural sector is more dominant accounting for 77% of total working population.

**Composition of Working Population in 1999 (%)**

No.	District	Agriculture & forestry	Fishery	Mining	Manufacturing & construction	Other
1.	Quy Nhon city	15.5	10.0	2.1	25.3	47.1
2.	An Lao	86.2	0.4	0.2	2.5	10.7
3.	Hoai An	86.4	0.2	-	4.4	9.0
4.	Hoai Nhon	66.1	10.6	0.3	8.8	14.2
5.	Phu My	80.7	6.2	2.2	2.9	8.0
6.	Phu Cat	82.0	3.0	1.8	4.6	8.6
7.	Vinh Thanh	88.6	0.1	-	1.6	9.7
8.	Tay Son	81.7	-	0.1	7.7	10.5
9.	An Nhon	71.5	0.1	0.2	13.1	15.1
10.	Tuy Phuoc	76.3	2.4	1.5	8.9	10.9
11.	Van Canh	83.2	-	0.1	3.6	13.1
	Total	69.0	4.4	1.1	9.7	15.8

Source: Population census 1/4/1999, Department of Statistics Binh Dinh Province

### 3 ECONOMIC CONDITION

#### 3.1 National Accounts

Gross Domestic Product (GDP) of Vietnam in 2001 is VND484,493 billion (approximately US\$ 32.2 billion) and per capita GDP in the same year is VND6.16 million (approximately US\$ 409).

Average annual growth rate of GDP during 10 years from 1991 to 2001 was 7.7% on a constant price basis, while that of per capita GDP was 6.0%. However, those during 4 years from 1997 to 2001 decelerated to 6.0% and 4.5%, respectively due to the influence of the regional economic crisis.

GDP of agriculture, forestry and fishery accounted for 40%, while industry and construction accounted for 24%, and services accounted for 36% in 1991. However, during 10 years from 1991 to 2001, the industrial structure had changed gradually and agriculture, forestry and fishery decreased the ratio to 24% while industry & construction and services increased their ratios to 38% and 38%, respectively. The average annual growth rates of the sectors are 4.3%, 11.6%, and 7.0%, respectively during 10 years from 1991 to 2001 on a constant price basis. Although the ratio of agriculture in GDP has been declining year after year, it is still the largest economic activity in GDP and is of the utmost importance to Vietnam since it is providing a living for more than 60% of the labor force.

#### 3.2 Regional Accounts

Gross regional domestic product (GRDP) of Binh Dinh Province is VND4.9 trillion(US\$326.4 million) in 2001, which accounted for 1% of the country's GDP as shown in Table A.2. Average annual growth rate of GRDP is high at 8.4% on constant price basis during six years from 1995 to 2001. However, the growth rate in 2001 is 5.7%, which is the lowest during the same period, due to influence of the current worldwide recession.

**GRDP and Per Capita GRDP of Binh Dinh Province**

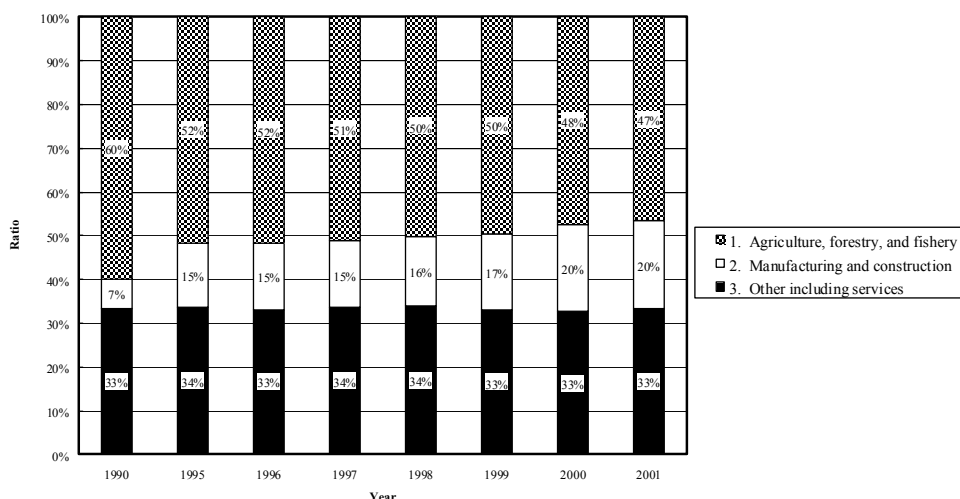
	1995	1996	1997	1998	1999	2000	2001
<b>GRDP Total (VND bn)</b>							
At current prices	2,717.7	3,122.4	3,435.2	3,856.0	4,181.3	4,591.9	4,917.5
At 1994 constant prices	2,388.7	2,627.6	2,869.8	3,071.4	3,359.3	3,661.3	3,874.0
Real growth (%)		10.0%	9.2%	7.0%	9.4%	9.0%	5.8%
<b>Per capita GRDP (VND1,000)</b>							
At current prices	1,949.1	2,209.9	2,399.9	2,659.7	2,848.3	3,091.0	3,268.1
At 1994 constant prices	1,713.2	1,859.7	2,004.9	2,118.5	2,288.4	2,464.6	2,574.6
Real growth (%)		8.6%	7.8%	5.7%	8.0%	7.7%	4.5%

Source: Statistical Yearbook of Binh Dinh Province 2001

Per capita GDP of Binh Dinh Province in 2001 was VND3.27 million (US\$217), which is almost the half of the national average. Similarly, average annual growth rate of the per

capita GDP was high at 7% during the same period but that in 2001 dropped significantly to 4.5%.

Average growth rates for past six years of manufacturing and construction sector was the highest at 20.4%, fishing was 8.5%, agriculture was 6.5%, other including services was 8.3%. As a result, industrial structure of Binh Dinh Province has changed gradually as shown below:



Structure of GRDP of Binh Dinh Province (%)

The share of agriculture, forestry and fishery has been decreasing gradually from 60% in 1990 to 47% in 2001. Conversely, the share of manufacturing (industry) and construction has been increasing from 7% in 1990 to 20% in 2001. Meanwhile the share of other sector including services is relatively stable between 33% and 34% during the same period.

### 3.3 GRDP of Kone River Basin

It is rather difficult to estimate accurate GRDP of Kone River Basin, but it is possible to compare gross output of some sectors between the province and the districts in the Kone River Basin. The districts in the Kone River Basin are Phu Cat, Vinh Thanh, Tay Son, An Nhon, Tuy Phuoc, Van Canh, Phu My, and Quy Nhon City.

#### Comparison of Gross Output of Sectors between Province and Kone Basin in 2001

No.	Item	Unit	Province	Kone River Basin	Ratio of Kone Basin
1	Gross output of Agriculture	VND billion	1,861.7	1,469.6	79%
2	Gross output of Forestry	VND billion	108.6	69.0	64%
3	Gross output of Fishery	VND billion	696.1	455.4	65%
4	Gross output of Industry	VND billion	1,800.1	1,722.1	96%
Weighed average (total)		VND billion	4,466.5	3,716.1	83%

Gross output of the Kone River Basin accounts for 79% in agriculture, 64% in forestry, 65%



in fishery, and 96% in industry sectors. Performance of the service and trade sector by district is not available but the sector deals with outputs of agriculture, forestry, fishery, and industry sectors. Therefore, weighted average value of these sectors is used to estimate the ratio in the service sector (83%). Based on the above assumption, socioeconomic profile of the Kone River Basin is summarized below:

**Socioeconomic Profile of Kone River Basin in 2001**

Item	Unit	Province	Ratio of	
			Kone river basin	Kone basin
Population	1,000 pers.	1,505	1,030	68%
Area	km <sup>2</sup>	6,026	3,927	65%
GRDP	VND bn	4,918	4,072	83%
- Agriculture, forestry & fishery	VND bn	2,007	1,505	75%
- Industry & construction	VND bn	1,160	1,114	96%
- Services & other	VND bn	1,750	1,453	83%

Comparing with ratios of population and area, economic performance of Kone River Basin is higher. It means that Kone River Basin should play important roll as engine of economic development of the Province. Also Kone River Basin includes the provincial capital city, Quy Nhon, which will be commercial center of the region including Central Highlands.

### 3.4 Foreign Trade

The merchandise trade balance of Vietnam runs a structural deficit, with exports covering approximately 65 to 90 % of imports. The export had been increasing faster than import and the trade deficit had narrowed until 1999. However, it widened again in 2000 and 2001.

**Merchandise Trade of Vietnam**

	Merchandise Trade (US\$ million)					
	1996	1997	1998	1999	2000	2001
Export	7,256	9,185	9,360	11,541	14,483	15,027
Import	11,144	11,592	11,500	11,742	15,637	16,162
Balance	-3,888	-2,407	-2,139	-201	-1,154	-1,135
	% Change Year on Year					
	95-96	96-97	97-98	98-99	99-00	00-01
Export	33.2	26.6	1.9	23.3	25.5	3.8
Import	36.6	4.0	-0.8	2.1	33.2	3.4

Source: Statistical Yearbook 2001, GSO

The major export commodities are crude petroleum, textile & garments, marine products, and footwear, which account for 21%, 13%, 12%, and 10% of the total export turnover, respectively in 2001. Vietnam is the second largest rice and coffee exporter in the world. However, the export turnovers of rice and coffee have been decreasing due to drop of their international market prices. The export turnovers of rice and coffee account for only 3.9% and 2.5% of the total export turnover, respectively.

The major import commodities are machinery & equipment, petroleum products, leather &

clothing materials, iron & steel, and fertilizers.

Japan remains Vietnam's largest individual trading partner in terms of export turnover (16.7% of total exports). Meanwhile, the share of EU has gone up significantly from 12.2% in 1995 to 20.0% in 2001. Vietnam concluded the bilateral trade agreement with the United States in 2000. The export turnover with the United States has grown double from US\$504 million in 1999 to US\$1,065 million in 2001 and the amount accounts for 7.1% of total export of Vietnam.

Total export turnover of Binh Dinh Province in 2001 was US\$90.1 million, which increased more than four times of that in 1995. Major export commodities are refined wood, logs, fish, rice, cashew nuts, footwear, and garments. Meanwhile total import of the province was US\$90.1 million. Major import commodities are plastic materials, tires & tubes for vehicle, fertilizer, etc. Major exports and imports are shown in Table A.3.

**Export and Import of Binh Dinh Province (US\$ million)**

Commodity Groups	1995	1999	2000	2001
<b>Export</b>	21.5	71.2	103.9	90.1
Aquatic products	7.6	15.7	23.0	27.4
Agricultural products	1.0	7.2	7.1	7.2
Forest products	6.2	35.4	59.3	40.4
Industrial products	3.6	7.6	8.8	9.2
Mineral resources	3.0	5.4	5.6	6.0
<b>Import</b>	11.2	44.9	74.9	61.1
Machinery, equipment	0.4	3.5	1.9	3.0
Spare parts of vehicle	4.7	4.7	17.9	19.1
Half finished goods	6.0	34.4	51.5	36.3
Consumer goods	0.1	2.3	3.6	2.6

Source: Statistical Yearbook of Binh Dinh Province 2001

## 4 ECONOMIC PROFILE

### 4.1 Agriculture, Forestry, and Fishery

From the socioeconomic viewpoints, agriculture including crop & livestock, forestry, and fishery sectors are characterized as the mainstay of economy in Binh Dinh Province, producing 47% of Gross Regional Domestic Products (GRDP), 73% of employment. Furthermore, about 90% of the population is categorized as rural habitants and their living is largely depending on agriculture. Many positive changes have occurred in agricultural sector, from a self-supplying changing into commodity agriculture gradually.

Paddy cultivation is the main agricultural activity in the province. The average paddy production during the period from 1999 to 2001 is presented below:

**Paddy Production of the Province (average during 1999 to 2001)**

Cropping Season	Winter-Spring	Summer-Autumn	3 <sup>rd</sup> Crop	Total
Planted Area (ha)	46,700 ha	40,600 ha	40,000 ha	127,300 ha
Unit Yield (ton/ha)	4.71 ton/ha	4.25 ton/ha	3.30 ton/ha	4.12 ton/ha
Production (ton)	220,100 ton	172,700 ton	132,100 ton	524,900 ton

Source: Statistical Yearbook 2001, Binh Dinh Province.

Other crops are also cultivated widely in the province. Production of other major crops is summarized below:

**Production of Other Crops in the Province (average during 1999 to 2001)**

	Planted Area (ha)	Unit Yield (ton/ha)	Production (ton)	Remarks
Maize	2,800	3.5	9,700	Expanding planted area
Cassava	10,200	9.9	100,700	Constant in planted area
Sweet Potato	1,100	4.6	5,000	Reducing planted area
Vegetables	8,800	10.1	89,100	Expanding planted area
Groundnut	8,300	1.5	12,400	Expanding planted area
Soybeans	1,900	1.4	2,700	Expanding planted area
Sesame	1,000	0.4	400	Expanding planted area
Sugarcane	8,300	43.9	364,200	Expanding planted area
Tobacco	200	1.5	300	Reducing planted area

Livestock farming is also practiced in the province. The province has been trying to improve quality and quantity of both cattle and poultry production. There are 221,000 of meet cattle at present. Ratio of crossbred cattle is planned to increase from present 30% to 40% by 2005 in order to improve the quality. Number of milk cow is also planned to increase from 800 heads at present to 5,000 head by 2005. Production of pigs, especially small size pig for export, is planned to increase.

Forestry areas are protected and further developed with coverage ranging from 28.2% in 1992 to 31.7% in 1995, and 33.8% in 2000. Areas of 3,361ha of concentrated forest have been planted annually on average. Wood exploitation in natural forest tends to decrease and exploitation of wood in production forest is increased. In the year 2000, the total quantity of

32,000m<sup>3</sup> of wood was exploited in the province.

Production of aquatic products has reached 77,000 tons in 2000, which is double of that in 1990. Production value of aquatic products in this decade has increased 12.3% annually on average, especially the growth from 1996 to 2000 is higher at 12.44% on constant price basis due to increase of intensive farming of shrimp cultivation.

#### 4.2 Industry

Although the industrial sector shows very rapid growth from 1995 to 2001 with an average growth rate of 22.9%, approximately 50% of industrial gross output was produced by agro-based manufacturing like food and beverage, leather tanning & processing, wood processing etc. This indicates that the agriculture sector supports the growth of industrial sector through supplying the materials.

<b>Gross Output of Industry in Binh Dinh Province (VND billion in 1994 constant price)</b>					
<b>Industrial activities</b>	<b>1995</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>Comp.in 2001</b>
<b>I. Agro-based manufacturing</b>	<b>248.2</b>	<b>669.5</b>	<b>879.3</b>	<b>902.2</b>	<b>50%</b>
Food and beverage	189.4	550.6	741.2	741.4	41%
Wood and bamboo processing	45.8	85.2	89.3	103.2	6%
Leather tanning & processing	13.1	33.6	48.7	57.7	3%
<b>II. Other manufacturing</b>	<b>272.9</b>	<b>526.5</b>	<b>808.7</b>	<b>897.9</b>	<b>50%</b>
Furniture	20.1	137.0	256.3	205.2	11%
Electricity	53.2	107.9	128.0	147.3	8%
Non-metallic mineral products	68.7	83.1	118.4	134.4	7%
Transport equipment	6.3	32.5	75.2	122.9	7%
Chemical & chemical products	29.7	42.9	69.5	96.7	5%
Quarrying and mining	27.3	32.2	41.9	46.6	3%
Garments	14.1	17.7	20.5	17.9	1%
Other	53.5	73.3	98.8	126.9	7%
<b>Total</b>	<b>521.1</b>	<b>1,195.9</b>	<b>1,688.0</b>	<b>1,800.2</b>	<b>100%</b>

Source: Statistical Yearbook 2001, Binh Dinh Province.

Major industrial products of the province are shown in Table A.4.

#### 4.3 Services

Service sector such as trade and social services of the province has achieved a high economic growth of 8.3% per annum for last six years. Total retail sales value in 2001 was VND4,797 billion (US\$318 million), which increased by 77% from that in 1995. The total export turnover of Binh Dinh Province was US\$90.1 million in 2001 and average annual growth was 27% on nominal basis. Out of this total turnover, forest product accounted for 45%, aquatic product 30%, manufacturing products 10%, agricultural products 8%, and mineral resources 7%. The commodities of the province have been exported to 32 foreign countries.

#### 4.4 Living Condition

According to the latest statistical data, the households making a livelihood by agriculture, forestry and fishery are 216,776 households or 79% of total households in Binh Dinh

Province. Meanwhile, those by industry and construction, services, and other sectors are 7%, 10% and 4%, respectively as shown in the table below:

**Major Source of Household Income in Binh Dinh Province**

Economic sector	Household	%
Agriculture, forestry, fishery	216,776	79
Industry and construction	18,820	7
Services	26,769	10
Other	11,247	4
<b>Total</b>	<b>273,612</b>	<b>100</b>

Source: Statistics of Agriculture and Rural Development 1996-2000

Table A.5 shows average income of state sector in Binh Dinh Province by economic activity. The average income of agricultural labors under local government management, which may be the most dominant type of economic activities, is VND701,300/person/month in 2001, which increased by 218% from that in 1995. Average number of working age population is 2.3 per household in the province. Therefore, the average household income of farmer is estimated VND1,612,990 (equivalent to US\$107) per household.

On the other hand, the number of poor and hunger household has been decreasing rapidly. In 1998, the number of poor and hunger households are 38,600 or 12.6% of the total households but it dropped rapidly to 28,100 or 8.8% of the total households.

**Poor and Hunger Households in Binh Dinh Province**

	1998	1999	2000
Poor and hunger households	38,600	33,100	28,100
Ratio	12.6%	10.7%	8.8%

Source: Statistics of Agriculture and Rural Development 1996-2000

## **5 INFRASTRUCTURE**

### **5.1 Education**

Educational infrastructure has already been constructed and improved to meet basic requirement. All the classrooms are tiled and most of primary schools and all the secondary schools are constructed with multi-stories. There are 144 kindergartens, 239 primary schools, 124 secondary schools, and 46 high schools in the province. Out of 126 communes in the province, 116 communes or 92% have kindergartens, 125 communes or 99% have primary schools, 101 communes or 80% have secondary schools, and 16 communes or 13% have high schools.

### **5.2 Health**

Health infrastructure has also been constructed and improved to meet basic requirement of the people. Polyclinic at northern part of the province was newly build, rehabilitation for provincial and district hospitals is conducted, and program on improvement of medical station is underway as part of National Health Project. There are 16 hospitals, 30 local clinics, 1 sanatorium, and 152 medical service stations in the province. All 126 communes have medical stations.

### **5.3 Transport and Communication**

Binh Dinh Province is located in one of the important transport point of the country. National Highway No.1 and railway connect Binh Dinh with northern provinces as well as southern provinces. National Highway No.19 joints the province with the provinces in Central Highlands. Phu Cat Airport links the province to Ho Chi Minh City. Quy Nhon Port is located at an attractive place for surrounding provinces as well as Northeastern Cambodia and Southern Laos for sea transportation of forest products, industrial products and minerals.

Transport system has been greatly invested during 1995 to 2000. Road betterment works and improvement of hundreds of bridges and culverts have been implemented. Quy Nhon port, Thi Nai port, and other fishing ports have been improved. Out of 126 communes in the province, 124 communes or 98% have the roads, which are accessible by car to the people's committees of the communes. All the people' committees have telephone, and 78 communes or 62% have post office in the commune.

### **5.4 Energy**

Electric network has been widely developed and all 126 communes have already been provided with electricity in Binh Dinh Province according to the latest survey on infrastructure as of October 2001. Out of whole households, 228,400 households or 90.4% use electricity. Electricity consumption at 55 million kWh in 1990 has increased to 112

million kWh in 1995, and 268 million kWh in 2000. Average retail price of electricity in the province is VND674/kWh.

## **6 ISSUES ON SOCIOECONOMIC DEVELOPMENT**

As have seen so far, Binh Dinh Province including the Kone River Basin has achieved remarkable developed during the last decade and is expected to maintain sustainable development.

The province put the greatest emphasis on agro-based industry like food and beverage, sugar, dairy products, leather tanning & processing, wood processing etc., and it will be the engine of socioeconomic development of the Kone River Basin. This indicates that agriculture sector supports the growth of industrial sector through supplying the materials.

However, due to meteorological and geomorphologic conditions of the basin, water deficit in dry season and flood disaster in rainy season occurs quite frequently. The water deficit has caused not only irrigation, domestic and industrial water supply problems, but also serious water pollution and saline water intrusion. The flood disaster has ruined agricultural production, economic infrastructure, private and public assets, and human lives. It has also impeded economic activities. Such losses have hindered the socioeconomic development of the basin. When such disaster occurs, the poor are the first to suffer and the last to recover. Disasters make the poor poorer. There is little hope to realize equitable affluent society if repeating such conditions.

In order to achieve sustainable socioeconomic development and stability of people's livelihood of the regions, taking measures to resolve such water issues in the Kone River Basin is of absolute necessity.

**Table A.1 Population in Kone River Basin (1/2)**  
(Average Population in 2001)

No.	District	Ward/Commune/ Town	Area (km <sup>2</sup> )	No. of household (1,000)	Population (1,000)	Average family size (person/hh)	Population density (person/km <sup>2</sup> )
<b>1.</b>	<b>Quy Nhon city</b>		213.0	52.41	244.9	4.7	1,150
		P. Tran Quang Dieu	10.93	3.30	15.3	4.6	1,398
		P. Bui Thi Xuan	49.65	2.70	13.3	4.9	267
		P. Dong Da	6.25	4.40	20.9	4.8	3,344
		P. Quang Trung	7.75	2.26	9.6	4.2	1,233
		P. Ghenh Rang	24.78	1.43	6.1	4.3	248
		P. Ngo May	1.4	4.64	20.0	4.3	14,251
		P. Nguyen Van Cu	1.43	2.78	12.9	4.6	9,006
		P. Tran Hung Dao	0.47	2.32	10.5	4.5	22,338
		P. Le Hong Phong	1.05	3.23	14.5	4.5	13,826
		P. Tran Phu	0.72	4.46	21.6	4.8	30,040
		P. Le Loi	0.57	3.03	13.6	4.5	23,860
		P. Hai Cang	9.81	4.18	20.1	4.8	2,045
		P. Nhon Binh	14.68	3.14	16.0	5.1	1,093
		P. Nhon Phu	13.19	3.49	16.6	4.8	1,258
		Xa Nhon Ly	15.35	1.75	9.1	5.2	591
		Xa Nhon Hai	12	1.12	5.5	4.9	458
		Xa Nhon Hoi	40.28	0.67	3.1	4.6	77
		P. Ly Thuong Kiet	0.69	1.26	5.5	4.4	8,019
		P. Thi Nai	1.95	2.27	10.8	4.8	5,536
<b>2.</b>	<b>An Lao</b>		260.4	0.09	0.5	5.8	2
		Xa An Toan	260.44	0.09	0.5	5.8	2
<b>3.</b>	<b>Phu My</b>		170.4	16.08	73.1	4.5	429
		TT. Phu My	11.1	2.60	11.8	4.5	1,063
		Xa My Chanh	46.2	3.97	19.8	5.0	429
		Xa My Quang	20.28	1.63	7.4	4.6	367
		Xa My Hiep	55.5	3.72	15.0	4.0	270
		Xa My Tai	28.6	2.68	11.9	4.4	416
		Xa My Cat	8.7	1.48	7.2	4.9	827
<b>4.</b>	<b>Phu Cat</b>		549.6	34.24	156.6	4.6	285
		TT. Ngo May	7.55	2.59	11.2	4.3	1,480
		Xa Cat Son	113.4	1.07	4.8	4.5	42
		Xa Cat Minh	25.05	3.19	16.1	5.0	642
		Xa Cat Tai	38.7	2.60	10.8	4.1	279
		Xa Cat Lam	69.42	1.56	7.1	4.6	102
		Xa Cat Hanh	44.16	3.64	15.2	4.2	345
		Xa Cat Hiep	41.02	1.69	7.4	4.4	181
		Xa Cat Trinh	47.55	2.91	13.0	4.5	274
		Xa Cat Nhon	38.55	2.28	10.6	4.6	274
		Xa Cat Hung	41.14	1.56	7.7	4.9	186
		Xa Cat Tuong	29.14	3.44	16.7	4.9	573
		Xa Cat Tan	28.02	3.67	16.2	4.4	579
		Xa Cat Tien	17.34	2.20	11.0	5.0	633
		Xa Cat Thang	8.53	1.84	8.9	4.8	1,039
<b>5.</b>	<b>Vinh Thanh</b>		700.8	5.61	26.4	4.7	38
		Xa Vinh Son	171.45	0.49	2.6	5.3	15
		Xa Vinh Kim	193.26	0.58	2.7	4.7	14
		Xa Vinh Hoa	82.44	0.24	1.3	5.1	15
		Xa Vinh Hiep	64.37	0.60	2.7	4.6	42
		Xa Vinh Hao	60.17	0.59	2.6	4.4	43
		Xa Vinh Quang	68.35	1.76	8.2	4.6	119
		Xa Vinh Thinh	60.75	1.34	6.3	4.7	104



**Table A.1 Population in Kone River Basin (2/2)**  
(Average Population in 2001)

No.	District	Ward/Commune/ Town	Area (km <sup>2</sup> )	No. of household (1,000)	Population (1,000)	Average family size (person/hh)	Population density (person/km <sup>2</sup> )
<b>6.</b>	<b>Tay Son</b>		708.0	29.16	133.2	4.6	188
		TT. Phu Phong	3.79	2.93	13.3	4.5	3,515
		Xa Binh Tan	110.3	1.37	6.1	4.4	55
		Xa Tay Thuan	97.19	1.63	7.8	4.8	81
		Xa Binh Thuan	40.8	1.79	8.0	4.4	195
		Xa Tay Giang	73.52	2.58	12.6	4.9	172
		Xa Binh Thanh	55.32	2.58	11.3	4.4	203
		Xa Tay An	10.4	1.31	5.5	4.2	531
		Xa Binh Hoa	13.8	1.96	8.7	4.4	627
		Xa Binh Tuong	37.7	2.53	12.8	5.1	340
		Xa Tay Vinh	7.1	1.71	7.4	4.3	1,039
		Xa Tay Binh	7.2	1.44	6.3	4.4	879
		Xa Vinh An	104.2	0.17	0.9	5.4	9
		Xa Tay Xuan	38.54	1.83	8.3	4.5	216
		Xa Tay Phu	59.12	2.29	11.1	4.8	187
		Xa Binh Nghi	49	3.04	13.1	4.3	267
<b>7.</b>	<b>An Nhon</b>		242.2	41.67	184.9	4.4	763
		TT. Binh Dinh	6.12	4.06	17.6	4.3	2,873
		TT. Dap Da	5.07	3.88	18.5	4.8	3,650
		Xa Nhon Thanh	12.66	3.48	16.0	4.6	1,260
		Xa Nhon My	17.15	2.90	12.5	4.3	730
		Xa Nhon Hanh	10.88	2.61	11.1	4.3	1,024
		Xa Nhon Phong	8.25	2.00	8.9	4.4	1,075
		Xa Nhon Hau	12.25	3.03	13.6	4.5	1,111
		Xa Nhon An	8.76	2.15	10.2	4.7	1,162
		Xa Nhon Hung	8.33	2.70	12.5	4.6	1,500
		Xa Nhon Phuc	10.68	2.74	11.6	4.3	1,090
		Xa Nhon Khanh	8.58	2.14	9.1	4.3	1,062
		Xa Nhon Loc	12.27	2.15	9.3	4.3	758
		Xa Nhon Hoa	27.83	3.98	17.7	4.4	635
		Xa Nhon Tho	32.01	2.14	9.1	4.2	284
		Xa Nhon Tan	61.33	1.68	7.2	4.3	118
<b>8.</b>	<b>Tuy Phuoc</b>		284.9	39.98	186.1	4.7	653
		TT. Tuy Phuoc	6.36	2.71	12.6	4.6	1,973
		TT. Dieu Tri	5.47	2.59	12.2	4.7	2,233
		Xa Phuoc Thang	13.79	2.24	10.6	4.7	765
		Xa Phuoc Hung	10.15	2.93	13.3	4.5	1,313
		Xa Phuoc Hoa	19.99	3.37	15.7	4.7	786
		Xa Phuoc Quang	10.81	2.85	13.2	4.6	1,223
		Xa Phuoc Son	25.84	4.98	23.6	4.7	914
		Xa Phuoc Hiep	15.72	3.68	16.5	4.5	1,048
		Xa Phuoc Loc	11.65	3.07	14.5	4.7	1,248
		Xa Phuoc Thuan	21.63	3.43	16.3	4.8	753
		Xa Phuoc Nghia	6.8	1.07	4.7	4.4	688
		Xa Phuoc An	33.51	3.87	18.5	4.8	551
		Xa Phuoc Thanh	35.05	2.20	9.9	4.5	282
		Xa Phuoc My	68.1	1.00	4.6	4.6	68
<b>9.</b>	<b>Van Canh</b>		798.0	4.81	22.1	4.6	28
		Xa Canh Hiep	130.02	0.82	3.6	4.4	28
		Xa Canh Lien	382.27	0.40	2.2	5.5	6
		Xa Canh Vinh	99.54	1.69	7.4	4.4	74
		Xa Canh Hien	36.8	0.50	2.3	4.6	63
		Xa Canh Thuan	97.11	1.11	5.2	4.7	54
		Xa Canh Hoa	52.23	0.29	1.4	4.9	27
<b>Total</b>			<b>3,927.1</b>	<b>224.04</b>	<b>1,027.8</b>	<b>4.6</b>	<b>262</b>

Source: Statistical Yearbook of each districts 2001

Population and Household Census in April 1st, 1999, Binh Dinh Province

Note: Number of household in Kone River Basin was estimated by JICA study team on assumption that the average family size in 2001 is the same as that in 1999 Populacen and Household Census.

**Table A.2 Gross Regional Domestic Product of Binh Dinh Province**

	1995	1996	1997	1998	1999	2000	2001
<b>GRDP Total at Current Price (VND bn)</b>							
1. Agriculture, forestry, and fishery	1,388.4	1,591.3	1,702.0	1,820.9	1,888.9	1,940.5	2,007.1
1) Agriculture	1,040.5	1,204.5	1,284.2	1,381.6	1,409.1	1,401.1	1,423.4
2) Forestry	84.2	88.1	83.6	76.8	86.6	90.2	94.0
3) Fishery	263.7	298.7	334.2	362.6	393.2	449.2	489.7
2. Industry and construction	406.8	486.8	557.1	686.4	810.1	1,036.8	1,160.4
1) Industry	210.3	274.0	317.9	413.3	544.7	749.8	838.1
2) Construction	196.4	212.8	239.2	273.1	265.5	287.0	322.2
3. Other	922.5	1,044.3	1,168.4	1,348.6	1,482.2	1,614.7	1,750.0
Total	2,717.7	3,122.4	3,435.2	3,856.0	4,181.3	4,591.9	4,917.5
<b>GRDP Total at 1994 Constant Price (VND bn)</b>							
1. Agriculture, forestry, and fishery	1,232.4	1,361.6	1,470.0	1,536.2	1,667.5	1,741.7	1,805.6
1) Agriculture	928.8	1,034.8	1,107.8	1,156.6	1,265.3	1,325.6	1,354.8
2) Forestry	74.0	75.9	72.5	67.3	64.3	70.9	76.4
3) Fishery	229.5	250.9	289.7	312.3	337.9	345.2	374.4
2. Industry and construction	354.2	394.3	433.4	495.5	579.8	722.4	776.9
1) Industry	180.3	216.2	239.6	290.5	380.5	515.2	548.6
2) Construction	173.9	178.1	193.8	205.1	199.3	207.3	228.3
3. Other	802.1	871.7	966.4	1,039.7	1,112.1	1,197.2	1,291.4
Total	2,388.7	2,627.6	2,869.8	3,071.4	3,359.3	3,661.3	3,874.0
<b>Structure of GRDP (%)</b>							
1. Agriculture, forestry, and fishery	52%	52%	51%	50%	50%	48%	47%
1) Agriculture	39%	39%	39%	38%	38%	36%	35%
2) Forestry	3%	3%	3%	2%	2%	2%	2%
3) Fishery	10%	10%	10%	10%	10%	9%	10%
2. Industry and construction	15%	15%	15%	16%	17%	20%	20%
1) Industry	8%	8%	8%	9%	11%	14%	14%
2) Construction	7%	7%	7%	7%	6%	6%	6%
3. Other	34%	33%	34%	34%	33%	33%	33%
Total	100%	100%	100%	100%	100%	100%	100%
<b>Real Growth (% Year on Year)</b>							
1. Agriculture, forestry, and fishery	10.5%	8.0%	4.5%	8.5%	4.4%	3.7%	6.6%
1) Agriculture	11.4%	7.1%	4.4%	9.4%	4.8%	2.2%	6.5%
2) Forestry	2.5%	-4.5%	-7.1%	-4.5%	10.3%	7.9%	0.5%
3) Fishery	9.3%	15.5%	7.8%	8.2%	2.2%	8.4%	8.5%
2. Industry and construction	11.3%	9.9%	14.3%	17.0%	24.6%	7.5%	14.0%
1) Industry	19.9%	10.9%	21.2%	31.0%	35.4%	6.5%	20.4%
2) Construction	2.4%	8.8%	5.8%	-2.8%	4.0%	10.2%	4.6%
3. Other	8.7%	10.9%	7.6%	7.0%	7.7%	7.9%	8.3%
Total	10.0%	9.2%	7.0%	9.4%	9.0%	5.8%	8.4%

Source: Statistical Yearbook of Binh Dinh Province 1998 and 2001, Statistical Bureau of Binh Dinh Province

**Table A.3 Major Exports and Imports of Binh Dinh Province**

Commodities	Unit	1995	1999	2000	2001
<b>I. Export</b>					
Frozen aquatic products	ton	1,014	1,491	2,069	3,024
Fresh aquatic products	ton	163	357	141	483
Dry aquatic products	ton	0	19	401	733
Swallow nest	kg	757	635	588	494
Rice	ton	0	1,999	1,096	1,500
Cashew nuts	ton	0	366	700	266
Coffee	ton	0	18	196	216
Dry cassava	ton	5,421	30,894	16,596	38,138
Stone for construction	m3	105	11,363	12,119	9,816
Titanium ore	ton	8,833	49,330	47,055	57,178
Refined wood	m3	5,494	20,544	40,823	25,969
Log	m3	5,887	6,608	3,951	553
Charcoal made of coconut shell	ton	0	170	246	362
Sandalwood chip	ton	22,257	46,667	49,300	62,186
Rattan products	1,000 pcs	369	706	527	411
Thread made of coconut fiber	ton	0	385	69	249
Shoes and sandal	1,000 pairs	462	1,322	1,722	2,522
Garments	1,000 pcs	235	413	707	7,624
Medical pills	1,000 pcs	44	7,336	24,957	6,581
Medical ampoules	1,000 pcs	5	2,689	7,078	1,665
<b>II. Import</b>					
Truck	pcs	364	275	1,218	729
Motor vehicle for special purposes	pcs	0	57	23	1
Tire & tubes for vehicle	pcs	4,045	3,901	1,318	5,198
Material plastic	ton	3,389	12,915	11,608	12,242
Material for medicine	ton	0	99	119	8,231
Urea fertilizer	ton	0	77,673	59,242	90,888
Steel	ton	384	12,229	18,026	10,566
Tinplate	ton	0	2,685	5,139	7,476
Log	m3	0	14,553	52,448	55,176

Source: Statistical Yearbook Binh Dinh Province 2001

**Table A.4 Major Industrial Products of Binh Dinh Province**

Products	Unit	1995	1996	1997	1998	1999	2000	2001
<b>1. Central Industry</b>								
Lumber	1,000 m <sup>3</sup>	1.5	3.7	1.7	1.3	1.4	6.5	1.2
Oxygen	1,000 m <sup>3</sup>	584	573	671	719	668	720	706
Electricity	1,000 Kw	7,874	12,164	14,475	26,741	12,353	8,872	3,033
Commercial electricity	MKw	112				227	269	310
<b>2. Local Industry</b>								
Fish sauce	1,000 l	3,784	3,823	3,934	4,531	5,326	6,317	6,755
Vegetable oils	ton	978	1,113	1,396	1,757	2,016	2,352	2,311
Feed for livestock	ton	574	535	1,149	1,091	1,161	1,072	2,561
Sugar syrup	ton	11,919	15,041	19,441	23,474	34,673	41,239	25,635
Of which, granulated	ton			4,577	15,092	27,913	35,575	21,433
Beer	1,000 l	289	276	3,886	7,745	12,379	15,949	17,022
Garments	1,000 pcs	209	472	628	794	721	770	588
Paper, cover	ton	233	164	207	261	498	268	234
Printing	sheets	464	507	695	977	1,283	1,420	1,700
Medicinal ampoules	million pcs	17	18	20	19	15	26	36
Medicinal pills	million pcs	117	155	127	129	100	157	144
Liquid medicine	1,000 l	31	38	214	34	48	75	71
Bycycle tyres	1,000 pcs	69	57	52	66	76	76	77
Bricks	million pcs	61	78	88	81	90	110	147
Roof tiles	million pcs	58	66	66	40	34	37	37
Lime	ton	2,672	2,830	4,890	6,664	6,220	6,457	6,631
Cement	1,000 ton	17	16	28	30	42	79	90
Titanium ore 52%	ton	5,920	9,292	4,593	8,785	12,323	10,012	14,917
Stones	1,000 m <sup>3</sup>	43	46	51	57	81	148	317
Salt	1,000 ton	37	31	36	33	33	13	14
Frozen aquatic products	ton	1,515	1,423	1,303	1,069	1,803	3,302	3,494
Rice milling	1,000 ton	232	260	292	304	320	330	350
Shoes and sandals	1,000 pair	729	770	1,276	1,145	1,259	1,863	2,500
Processed wood	1,000 m <sup>3</sup>	15	19	9	10	10	18	14
Sedge mat	1,000 pcs	460	682	753	757	794	845	948
Fishing boat	pcs/CV	97	159	106	231	210	299	237
Tap water	1,000 m <sup>3</sup>	4,612	4,958	5,448	5,696	5,963	5,953	6,100
Commercial tap water	1,000 m <sup>3</sup>	2,891	3,225	3,002	3,643	3,615	3,745	3,975
<b>3. Foreign Invested Industry</b>								
Titanium ore 52%	ton	0	612	25,715	27,052	28,640	27,468	28,047

Source: Statistical Yearbook of Binh Dinh Province 1998 and 2001

**Table A.5 Average Income of State Sector in Binh Dinh Province**

Unit: VND1,000/person/month

Sector	State Sector				State Sector (Local govt. mgmt.)				State Sector (Central govt. mgmt.)			
	1995	1999	2000	2001	1995	1999	2000	2001	1995	1999	2000	2001
1. Agriculture & forestry	321	580	703	697	321	587	706	701	-	349	615	565
2. Fishery	565	616	728	633	565	616	728	633	-	-	-	-
3. Mining & quarrying	717	711	649	737	717	721	560	356	-	639	823	1,061
4. Manufacturing	369	600	674	801	393	642	715	822	256	382	512	692
5. Electricity & water supply	602	1,276	1,495	1,964	608	775	1,233	1,721	601	1,340	1,525	1,994
6. Construction	490	804	843	881	355	699	642	924	600	875	957	859
7. Wholesale, trade, repair of motor vehicles	512	763	1,054	1,198	396	680	839	1,064	1,089	919	1,468	1,413
8. Hotels and restaurant	409	628	625	636	409	622	565	584	-	637	716	704
9. Transport, storage & communication	615	1,271	1,568	1,501	269	813	1,493	1,310	916	1,339	1,571	1,508
10. Finance	614	1,098	1,475	1,578	1,315	1,825	2,148	2,503	550	1,052	1,432	1,515
11. Science, technology	245	382	435	543	245	380	437	530	252	389	430	593
12. Real estate, renting business	608	956	1,023	1,200	818	1,094	1,225	1,361	494	832	806	1,016
13. Public administration	374	438	552	666	346	411	515	623	398	474	603	726
14. Education & training	268	497	623	773	264	495	619	751	356	543	716	1,187
15. Health & social work	258	429	502	622	257	430	500	620	268	409	534	659
16. Recreation, culture & sports	290	528	587	916	287	528	587	917	667	500	655	765
17. Party, membership organization	384	436	546	637	378	435	542	633	461	464	612	714
18. Community, social services	237	247	374	520	237	247	374	520	-	-	-	-
<b>Average</b>	<b>366</b>	<b>605</b>	<b>715</b>	<b>835</b>	<b>319</b>	<b>539</b>	<b>629</b>	<b>755</b>	<b>527</b>	<b>819</b>	<b>971</b>	<b>1,071</b>

Source: Statistical Yearbook 2001 Binh Dinh Province

## **Appendix B**

### **Present Land Use and Irrigation**

# **Appendix B**

## **Present Land Use and Irrigation**

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## Appendix B Present Land Use and Irrigation

### 1 PRESENT CONDITION OF LAND USE

#### 1.1 Present Land Use in the Province

The present land use in the province and the Kone River Basin is shown in Tables B.1 and B.2 respectively. The Kone River Basin, including the Ha Thanh River Basin extends over 364,000 ha. In addition, 24,200 ha are located in south of the La Tinh River basin and will be irrigated by the water from the Kone River. Consequently, the total area for the study is 388,200 ha, covering 64% of the whole province. The land use is estimated based on the statistics through identifying the local administrative units of ward, sub-towns and communes, as shown below:

**Present Land of the Kone River Basin (2000)**

River Basin	Agriculture Land	Forest Land	Special Use Land	Residence Area	Unused Land	Total
Province (Proportion)	116,900 ha 19.4%	193,700 ha 32.1%	29,400 ha 4.9%	6,400 ha 1.1%	256,200 ha 42.5%	602,600 ha 100.0%
Kone	54,900 ha	131,300 ha	13,300 ha	2,600 ha	98,900 ha	301,000 ha
Ha Thanh Basin	11,000 ha	16,300 ha	4,300 ha	1,100 ha	30,300 ha	63,000 ha
La Tinh	10,200 ha	1,300 ha	2,200 ha	500 ha	10,000 ha	24,200 ha
Study Area (Proportion)	76,100 ha 19.6%	148,900 ha 38.4%	19,800 ha 5.1%	4,200 ha 1.1%	139,200 ha 35.9%	388,200 ha 100.0%

Source: Estimation by the JICA Study Team based on the Data Set of Binh Dinh Land Use General Inventory in 2000, Land Office.

In the province, agriculture land is 116,900 ha or 19% of total land, extending over the flat lands and gentle slopes. Forest land covers 193,600 ha (32%), comprising of natural forest (151,500 ha) and planted forest (42,100 ha). The remaining 292,000 ha (49%) is special land use, residential area and unused land.

Agriculture land in the Kone River Basin is 76,100 ha, consisting of 54,900 ha, 11,000 ha in the Ha Thanh River Basin and 10,200 ha in the La Tinh River Basin. Agricultural land corresponds to 65% of total agriculture land in the province.

Agriculture land is divided into five land categories, i. e. (1) land for annual crops and slash & burned (shifting culture), (2) miscellaneous garden in the homestead, (3) perennial crops, (4) grassland for grazing, and (5) aquaculture. Each categories by districts are tabulated in Table B.1 and summarized below:

**Agriculture Land of the Province (2000)**

<b>River Basin</b>	<b>Annual Crops</b>	<b>Miscellaneous</b>	<b>Perennial Crops</b>	<b>Aqua-culture</b>	<b>Total</b>
Province	84,700 ha	15,200 ha	14,400 ha	2,600 ha	116,900 ha
Kone	39,000 ha	6,600 ha	7,700 ha	800 ha	54,900 ha
Ha Thanh	8,000 ha	1,000 ha	1,000 ha	1,000 ha	11,000 ha
La Tinh	7,900 ha	1,400 ha	400 ha	500 ha	10,200 ha
<b>Total</b>	<b>55,700 ha</b>	<b>9,000 ha</b>	<b>9,100 ha</b>	<b>2,300 ha</b>	<b>76,100 ha</b>

Note: Grassland is 10 ha in the province and 4 ha in the study area, and not presented above.  
Source: Data Set of Binh Dinh Land Use General Inventory in 2000, Land Office.

In the province, out of 84,700 ha of annual crops land, 53,600 ha is paddy field and 26,200 ha for upland field. Slash & burned (shifting culture) is limited to 4,900 ha. Aquaculture is 2,600 ha for both fresh and brackish water.

Out of 54,700 ha for annual crops in the Kone River Basin, paddy field is 35,800 ha, upland crops fields is 17,900 ha. These areas correspond to 67% of those of the province.

## 2 PRESENT CONDITION OF AGRICULTURE

### 2.1 General

From the socio-economic view points, the agriculture sector, including crop & livestock, forestry and fishery sub-sectors, is characterized as the mainstay of economy in the Binh Dinh province, producing 47% of Gross Domestic Products (GDP) and 73% of total employment (refer to Tables B.3 and B.4). Furthermore, about 76% of the population are categorized (refer to Table B.5) as rural habitants and their living is largely depending on agriculture (employment by sector refer to Tables B.6). In the industry sector, more than 40% of gross output value is accrued by manufacturing of agriculture material (refer to Table B.7). This indicates that the agriculture sector sustains the industrial sector by supplying the materials.

Gross output value of agriculture sector is shown in Table B.8. Out of total gross output, 76% was accrued from crop and livestock sub-sectors, 20% was from fishery sub-sector, and the remaining 4%. Vegetables and shrimp aquaculture shows the high growth rate among the sub-sectors.

### 2.2 Cropped Production in the Province

Tables B.9 to B.11 present the average of cropped area, unit yield and production of main crops during the period from 1999 to 2001. The total cropped area is about 199,200 ha, consisting of 170,500 ha of annual crops and 28,700 ha of perennial crops, as summarized below:

**Cropped Area of Crops (average during 1999 to 2001)**

Annual Crop				Perennial Crop		Total
Paddy	Other Food Crops	Vegetables & Beans	Industrial Crop	Industrial Tree Crops	Fruit Trees	
127,300 ha	14,100 ha	9,400 ha	19,700 ha	24,800 ha	3,900 ha	199,200 ha
64.0%	7.1%	4.7%	9.9%	12.4%	2.0%	100.0%

Source: Statistical Yearbook 2001, Binh Dinh Province.

Paddy is the largest cropped area, representing 127,300 ha or 64% of total cropped area. Cassava is the second largest crop of 10,200 ha. Maize, groundnuts, soybeans, sesame, sugarcane and vegetables have been expanding in their cropped area since 1995. Sweet potatoes and tobacco is decreasing.

Regarding perennial crops, coconuts are the largest in planted area. Cashew and fruits trees like orange, pineapple, banana and mango have been expanding in their cropped area.

Paddy is cropped in three seasons, namely winter-spring crop, summer-autumn crop and third crop in the rainy season. The main cropping season is the winter-spring crops,

however, cropped area in the summer-autumn and 3<sup>rd</sup> seasons has been expanding mainly due to irrigation development. Winter-spring paddy crop is started in December when rainy season is over, and harvested in February to March. After harvesting winter-spring paddy, summer-autumn paddy crop is started in March to April, and harvested June to July. Due to severe inundation in the rainy season during October to November, the 3<sup>rd</sup> paddy crop is not cultivated in the low-lying area, particularly in Tan An – Dap Da. The cropped area and production are summarized below:

**Paddy Production of the Province (average during 1999 to 2001)**

<b>Cropping Season</b>	<b>Winter-Spring</b>	<b>Summer-Autumn</b>	<b>3<sup>rd</sup> Crop</b>	<b>Total</b>
Cropped Area	46,700 ha	40,600 ha	40,000 ha	127,300 ha
Unit Yield (range at district level)	4.71 ton/ha (3.19 – 5.74)	4.25 ton/ha (3.00 – 4.49)	3.30 ton/ha (1.42 – 3.95)	4.12 ton/ha (2.16 – 4.74)
Production	220,100 ton	172,700 ton	132,100 ton	524,900 ton

Source: Statistical Yearbook 2001, Binh Dinh Province.

Total paddy production has been increasing from 400,000 ton in 1995 to 550,000 ton in 2001, owing to expansion of cropped area and increase of unit yield.

Most of the other annual crops except sweet potatoes and tobacco have been increasing their production. Particularly, production increase is remarkable in maize, cassava, vegetables, groundnuts, soybeans and sugarcane due to expansion of cropped area and unit yield, as summarized in the following table:

**Production of Other Crops in the Province (average during 1999 to 2001)**

	<b>Cropped Area (ha)</b>	<b>Unit Yield (ton/ha)</b>	<b>Production (ton)</b>	<b>Remarks</b>
Maize	2,800	3.5	9,700	Increase in area & unit yield
Cassava	10,200	9.9	100,700	Stable in area, increase in unit yield
Sweet Potato	1,100	4.6	5,000	Decrease in area
Vegetables	8,800	10.1	89,100	Increase in area & unit yield
Groundnut	8,300	1.5	12,400	Increase in area & unit yield
Soybeans	1,900	1.4	2,700	Increase in area & unit yield
Sesame	1,000	0.4	400	Increase in area & unit yield
Sugarcane	8,300	43.9	364,200	Increase in area & unit yield
Tobacco	200	1.5	300	Decrease in area

Source: Statistical Yearbook 2001, Binh Dinh Province.

Based on the above cropped area of each annual crops and land use described in the preceding Section 1, the cropping intensity is estimated at 237% for paddy crops and 139% for upland crops, average 201% for annual crop land, as shown below.

**Cropping Intensity of the Province (2000)**

Crop / Season		Physical Area (A)	Cropped Area (B)	Intensity (A / B)
Paddy:	Winter-Spring Crop	53,600 ha	46,700 ha	87%
Paddy:	Summer-Autumn	- do -	40,600 ha	76%
Paddy:	Third Crop	- do -	40,000 ha	75%
Paddy:	Annual Total	- do -	127,300 ha	237%
Upland Crop:	Annual Total	31,000 ha	43,200 ha	139%
Total		84,600 ha	170,500 ha	201%

Source: Estimation by the JICA Study Team using the statistical data mentioned in the preceding section.

The above table shows that cropping intensity of paddy field is less than 100% in each season. This may be due to short of irrigation water and crop diversification, and upland crops might be planted in the paddy field. If it is assumed that 13% of paddy field (6,900 ha, 100% - 87%) is planted for upland crops in the Winter-Spring season, the cropping intensity of upland field decreases to 117%.

For the perennial crops, planted area, unit yield and production are presented in the following table:

**Production of Perennial Crops in the Province (average during 1999 to 2001)**

	Planted Area (ha)	Unit Yield (ton/ha)	Production (ton)	Remarks
Tea	190	2.1	390	Decrease in area
Pepper	130	0.24	30	Increase in area, decrease in unit yield
Coffee	570	0.43	242	Decrease in area
Cashew	10,800	0.09	1,020	Increase in area, decrease in unit yield due to pre-mature growth
Coconut	13,100	5.06	66,300	Stable in area, increase in unit yield
Orange	220	3.40	740	Increase in area & unit yield
Pineapple	500	3.90	1,900	Increase in area & unit yield
Banana	1,400	4.20	6,100	Increase in area & unit yield
Mango	970	1.47	1,430	Increase in area & unit yield

Source: Statistical Yearbook 2001, Binh Dinh Province.

Production increase is remarkable in cashew and fruit trees, mainly due to the provincial policy.

### 2.3 Crop Production in the Kone River Basin

Cropped area in the Kone River Basin is estimated based on the district statistical data and list of communes located in the study area. Total cropped area is estimated at 125,500 ha or 63% of the province, as shown below:

### Planted Area of Crops in the Kone River Basin

	Paddy	Other Food Crops	Vegetables & Beans	Industrial Crop	Industrial Tree Crops	Fruit Trees	Total
Province	127,300 ha	14,100 ha	9,400 ha	19,700 ha	24,800 ha	4,100 ha	199,400 ha
Basin	84,800 ha	8,000 ha	6,300 ha	14,900 ha	11,100 ha	1,800 ha	125,500 ha
Proportion	67%	56%	67%	76%	45%	44%	63%

Source: Estimation based on the Statistical Yearbook 2001, Binh Dinh Province and districts.

Table B.12 presents the average paddy production during the period from 1999 to 2001 in each communes in the Kone River Basin along with cropped area and unit yield. Unit yields in each season are slightly higher than those of province, as shown below:

### Paddy Production of the Kone River Basin (average during 1999 to 2001)

Cropping Season	Winter-Spring	Summer-Autumn	3 <sup>rd</sup> Crop	Total
Cropped Area	30,900 ha	27,300 ha	26,600 ha	84,800 ha
Unit Yield (at commune level)	4.97 ton/ha (2.23 – 6.48)	4.31 ton/ha (2.07 – 5.60)	3.39 ton/ha (1.17 – 4.56)	4.26 ton/ha (1.28 – 6.02)
Production	153,800 ton	117,400 ton	90,200 ton	361,400 ton

Source: Statistical Yearbook 2001, each District in Binh Dinh Province.

Crop production in the Kone River Basin is estimated for each crop. Most of the annual crops are produced at more than 60% of the province except cassava and sweet potatoes, as shown in the following table:

### Production of Annual Crops in the Study Area

	Province	Study Area	Proportion	Main Districts of Production
Paddy	524,900 ton	361,400 ton	69%	An Nhon, Tuy Phuoc, Phu Cat
Maize	9,700 ton	6,100 ton	63%	An Hhon, Phu Cat, Tay Son
Cassava	100,700 ton	54,700 ton	54%	Phu Cat, Hoai Nhon, Phu My
Sweet Potato	5,000 ton	2,400 ton	47%	Phu Cat, Hoai An, Phu My
Vegetables	89,100 ton	64,000 ton	72%	Phu My, Tay Son, Tuy Phuoc
Groundnuts	12,400 ton	8,400 ton	68%	Phu My, Phu Cat, Tay Son
Soybeans	2,700 ton	2,600 ton	95%	An Nhon, Tuy Phuoc, Tay Son
Sesami	400 ton	240 ton	60%	Phu My, Phu Cat
Sugarcane	364,200 ton	238,000 ton	65%	Tay Son, Van Canh, Phu My
Tobacco	300 ton	250 ton	83%	Tay Son, Phu Cat

Source: Estimation based on the Statistical Yearbook 2001, Binh Dinh Province and districts.

For perennial crops, coffee, cashew and mango in the province are produced more than 60% of the provincial production, as shown in the following table:

**Production of Perennial Crops in the Study Area**

	<b>Province</b>	<b>Study Area</b>	<b>Proportion</b>	<b>Production Districts</b>
Coffee	250 ton	240 ton	96%	Phu Cat
Cashew	1,020 ton	630 ton	61%	Phu Cat, Phu My, Hoai An
Coconuts	66,300 ton	21,200 ton	32%	Hoai Nhon, Phu My, Hoai An
Pineapple	1,930 ton	660 ton	34%	Hoai An, An Lao, Vinh Thanh
Banana	6,070 ton	2,650 ton	44%	Hoai An, Hoai Nhon, An Lao
Mango	1,430 ton	970 ton	68%	Phu Cat, Tuy Phuoc, An, Lao

Source: Estimation based on the Statistical Yearbook 2001, Binh Dinh Province and districts.

**2.4 Livestock**

Number of livestock in the province for the period of three years during 1999 to 2001 is shown in Table B.13, and summarized in the following table:

**Livestock Production in the Province**

	(unit: head)			
<b>Livestock</b>	<b>1995</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Buffaloes	18,500	19,500	18,600	20,700
- Plough buffaloes	12,500	12,800	11,800	12,400
Cattle	230,300	239,500	238,800	192,500
- Plough cattle	91,800	79,500	79,000	63,100
- Other cattle	138,500	160,000	159,800	129,400
Pig	340,000	393,100	411,100	545,200
- Pork	284,700	324,400	337,600	466,600
Poultry	2,229,800	3,282,100	3,462,100	3,515,700

Source: Statistical Yearbook 2001, Binh Dinh Province.

Number of cattle has been decreasing, due to decrease of working cattle since mechanization of farming work has been expanded, particularly for land preparation. The provincial policy focuses to sift the cattle raising from plough purpose to meat and dairy production, and, new breed has been introduced to produce beef. This will change the structure of cattle breeding in the province. Pig and poultry have been increasing rapidly for income increase of farm household. The number of livestock in the study area is estimated below:

### Livestock Production in the Province

Livestock	(unit: head)			
	1995	1999	2000	2001
Buffaloes	9,900	9,500	9,500	12,200
- Plough buffaloes	7,100	5,800	5,600	6,900
Cattle	194,300	201,800	201,400	162,200
- Plough cattle	85,100	72,300	71,700	57,000
- Other cattle	109,200	129,500	129,700	105,200
Pig	234,733	270,800	284,000	369,300
- Pork	193,900	218,900	228,800	305,400

Source: Estimated based on the Statistical Yearbook 2001, Binh Dinh Province.

## 2.5 Fishery

Total fishery production has been increasing by 40% from 59,800 ton in 1995 to 84,600 in 2001, as shown in Table B.14 and summarized below:

### Fishery Production in the Province

Mode of Production	(unit: head)			
	1995	1999	2000	2001
Marine Fish Catch	58,660 ton	68,840 ton	75,140 ton	81,610 ton
Freshwater Fish Catch	-	280 ton	270 ton	420 ton
Aquaculture	1,160 ton	1,800 ton	2,420 ton	2,530 ton
Total Production	59,820 ton	70,910 ton	77,830 ton	84,560 ton

Source: Statistical Yearbook 2001, Binh Dinh Province.

Aquaculture is conducted mainly in the coastal area using brackish water, mainly located in Qui Nhon city and districts of Tuy Phuoc, Phu Cat, Phu My, Hoai Nhon. Largest area of aquaculture is located in low lying lands along the Thi Nai swamp. Shrimp culture production has been expanding by 250% since 1995 owing to increase of pond area and unit production per ha, as shown in Table B.15 and summarized below:

### Aquaculture Production in the Province

Mode of Production	1995	1999	2000	2001
Fish Culture Area	1,049 ha	1,417 ha	1,193 ha	1,542 ha
Fish Culture Production	682 ton	881 ton	752 ton	746 ton
Fish Culture Yield	650 kg/ha	620 kg/ha	630 kg/ha	480 kg/ha
Shrimp Culture Area	1,424 ha	2,002 ha	2,445 ha	2,609 ha
Shrimp Culture Production	481 ton	828 ton	1,559 ton	1,682 ton
Shrimp Culture Yield	340 kg/ha	410 kg/ha	640 kg/ha	640 kg/ha

Source: Statistical Yearbook 2001, Binh Dinh Province.



### 3 PRESENT CONDITION OF IRRIGATION

#### Irrigation Areas in Report of Province

Present condition of irrigation areas has been grasped with reference mainly to “Review and Supplementary Report on Agricultural and Rural Planning for Binh Dinh Province Towards 2010, Binh Dinh People’s Committee, Department of Agriculture and Rural Development (DARD), 2002”.

The report classifies whole irrigation areas in Binh Dinh Province into three (3) major zones as follows:

- (i) Lai Giang Basin
  - a. An Lao sub-basin
  - b. Kim Son sub-basin
  - c. North in Lai Giang
  - d. South of Lai Giang River
- (ii) Tra O Swamp
- (iii) South in Binh Dinh
  - a. North of La Tinh River
  - b. South of La Tinh River – North of Kone River
  - c. Tan An – Dap Da
  - d. South of Kone River
  - e. Ha Thanh River
  - f. Van Canh
  - g. Vinh Thanh

Out of the above three (3) zones, the zone of South in Binh Dinh has been selected for arrangement of the irrigation areas as follows:

Area in Review and Supplementary Report, Province		
Areas in River Basin	Area Initially Constructed	Area Presently Irrigated
	(ha)	(ha)
a. North of La Tinh River	4,190	3,405
b. South of La Tinh River and North of Kone Rive	7,813	5,169
c. Tan An - Dap Da	14,020	12,413
d. South of Kone River	6,700	4,530
e. Ha Thanh River	960	800
f. Van Canh	469	380
g. Vinh Thanh	595	365
Total	34,747	27,062

All the major schemes registered in the official list are listed in Table B.16.

Then, the irrigation schemes located in the Study Area were selected and the irrigation areas

have been calculated.

<b>Study Area</b>		
Areas in River Basin	Area Initially Constructed	Area Presently Irrigated
	(ha)	(ha)
a. North of La Tinh River	1,614	1,614
b. South of La Tinh River and North of Kone Rive	6,714	4,331
c. Tan An - Dap Da	14,020	12,413
d. South of Kone River	6,700	4,530
e. Ha Thanh River	960	800
f. Van Canh	469	380
g. Vinh Thanh	595	365
Total	31,072	24,433

From the above data, it is known that, as for the Study Area, the area where the irrigation systems were initially constructed is 31,100 ha and the area where the irrigation systems are presently functioning is 24,400 ha. It means that the balance of 6,700 ha would be the area where the initially constructed irrigation systems have been deteriorated due to the superannuation and the water shortage and need the rehabilitation.

All the major schemes located in the Study Area are listed in Table B.17

## 4 IRRIGATION FACILITIES

Existing irrigation facilities in the Study Area are summarized as follows:

**Major Irrigation Facilities in JICA Study Area**

Areas in River Basin	Dam	Weir	Pumping Station	Irrigation System
	(nos.)	(nos.)	(nos.)	(nos.)
A. North of La Tinh River	0	2	0	2
B. South of La Tinh River and North of Kone River	9	0	3	12
C. Tan An - Dap Da	0	15	13	24
D. South of Kone River	3	1	0	4
E. Ha Thanh River	4	0	0	4
F. Van Canh	2	0	0	2
G. Vinh Thanh	1	0	0	1
<b>Total</b>	<b>19</b>	<b>18</b>	<b>16</b>	<b>49</b>

Note. Some schemes have both of weir and pumping station or two pumping stations.  
Including Van Moi temporary weir.

All the major schemes in the above respective areas are shown in Table B.18.

### 4.1 Water Source Facilities

#### (a) Irrigation dam

It has been examined through the field reconnaissance that existing dams for irrigation purpose are functioning rather well with occasional rehabilitation.

#### (b) Weir

As for the intake weirs, all the some existing weirs such as the Bay Yen Weir and the Thach De Weir have been rehabilitated. However, including those rehabilitated weirs, almost all weirs in the area are of the stop log type and they are being operated with manpower. It requires really heavy work seasonally, which are put down at the beginning of the dry season and taken off just before the flood season. In spite of such difficulty, those weirs are being well operated and maintained with effort of the authorities and persons concerned.

#### (c) Pumping station

Pumping stations are also being operated and maintained well. There are few dead pumping stations.

### 4.2 Irrigation System

#### (a) Irrigation and drainage facilities

Majority of the irrigation systems are of the dual purpose canal for irrigation and drainage. It has a difficulty in drainage for the upper-stream area because of the check-up of water level for intake in the downstream area, while it has a merit in repeating use of water. In this situation, many drainage streams do not have enough capacity in the downstream reaches. Such characteristics are remarkable in the Tan

An – Dap Da Area.

(b) Farm road facilities

As for the farm road, many communal roads are networked and used for farming operation as well as the canal inspection roads. Many inspection roads are now of the earth road without pavement.

On the other hand, it is to be noted that parts of the communal roads have been paved with concrete. Majority of the pavement is of 3.0 m width and 0.20 m thickness of concrete.

**Table B.1 Present Land Use of Binh Dinh Province**

(unit: ha)

	Province		Qui Nhon	An Lao	Hoai Nhon	Hoai An	Phu My	Vinh Thanh	Phu Cat	Tay Son	An Nhon	Tuy Phuoc	Van Canh
<b>Total Area</b>	<b>602,556</b>	<b>100.0%</b>	<b>21,644</b>	<b>69,035</b>	<b>41,295</b>	<b>74,406</b>	<b>54,943</b>	<b>70,079</b>	<b>67,849</b>	<b>70,803</b>	<b>24,217</b>	<b>28,487</b>	<b>79,797</b>
		100.0%	3.6%	11.5%	6.9%	12.3%	9.1%	11.6%	11.3%	11.8%	4.0%	4.7%	13.2%
<b>I. Agricultural Land</b>	<b>116,887</b>	<b>19.4%</b>	<b>3,286</b>	<b>3,717</b>	<b>12,161</b>	<b>11,666</b>	<b>18,460</b>	<b>4,285</b>	<b>19,190</b>	<b>14,313</b>	<b>11,983</b>	<b>11,792</b>	<b>6,034</b>
1. Annual Crops	84,639	14.0%	1,890	2,287	8,441	8,957	13,129	2,777	12,242	11,495	9,428	9,218	4,776
- Paddy & Subsidiary Crops	53,554	8.9%	1,387	1,217	5,583	4,722	8,211	858	8,993	5,771	7,666	8,141	1,005
- Slash & Burned	4,880	0.8%	57	-	-	2,850	-	102	-	1,286	-	-	585
- Other Annual Crops	26,205	4.3%	446	1,070	2,858	1,385	4,918	1,817	3,249	4,439	1,762	1,077	3,185
2. Miscellaneous Garden	15,222	2.5%	345	437	2,791	1,085	2,671	467	2,555	1,709	1,655	1,162	346
3. Perennial Crops	14,368	2.4%	286	989	706	1,614	2,214	1,038	4,202	1,109	890	411	909
4. Grassland for grazing	10	0.0%	-	-	-	4	1	-	-	-	4	-	-
5. Aquaculture	2,648	0.4%	766	4	224	5	444	3	191	1	7	1,001	2
<b>II. Forestry Land</b>	<b>193,659</b>	<b>32.1%</b>	<b>4,741</b>	<b>35,283</b>	<b>8,656</b>	<b>11,266</b>	<b>6,221</b>	<b>39,895</b>	<b>15,443</b>	<b>25,847</b>	<b>1,365</b>	<b>3,589</b>	<b>41,354</b>
1. Natural Forest	151,532	25.1%	0	33,938	1,516	7,376	2,109	39,176	10,257	20,800	566	1,983	33,811
2. Artificial Forest	42,127	7.0%	4,741	1,345	7,140	3,890	4,111	719	5,186	5,047	799	1,606	7,543
3. Nursery Area	0	0.0%	-	-	-	-	-	-	-	-	-	-	-
4. Reproductive Zoning	0	0.0%	-	-	-	-	-	-	-	-	-	-	-
<b>III. Special Use Land</b>	<b>29,369</b>	<b>4.9%</b>	<b>1,699</b>	<b>703</b>	<b>3,153</b>	<b>2,523</b>	<b>4,205</b>	<b>1,097</b>	<b>5,745</b>	<b>2,842</b>	<b>2,719</b>	<b>3,718</b>	<b>966</b>
1. Construction	2,295	0.4%	517	58	203	92	223	157	275	229	251	237	54
2. Transportation	6,938	1.2%	473	213	1,034	469	1,235	245	830	701	680	752	305
3. Irrigation & Water Facilities	9,401	1.6%	105	154	1,084	820	1,536	543	1,916	1,058	802	929	455
4. Historical & Cultural Area	82	0.0%	0	-	1	-	2	-	39	13	9	18	-
5. Military Area	3,788	0.6%	222	4	10	939	43	39	1,077	66	162	1,158	68
6. Mineral Mining	300	0.0%	3	-	2	-	-	-	296	-	-	-	-
7. Construction Material	289	0.0%	71	3	1	10	21	3	69	22	84	2	5
8. Salt Production	269	0.0%	55	-	9	-	101	-	65	-	-	39	-
9. Cemetery	5,914	1.0%	239	271	808	169	1,039	107	1,167	746	725	583	58
10. Other	93	0.0%	15	-	-	25	7	2	10	6	6	-	21
<b>IV. Residential Land</b>	<b>6,401</b>	<b>1.1%</b>	<b>752</b>	<b>141</b>	<b>866</b>	<b>561</b>	<b>757</b>	<b>166</b>	<b>872</b>	<b>676</b>	<b>721</b>	<b>720</b>	<b>169</b>
1. Urban	915	0.2%	508	-	114	17	21	-	23	50	106	78	-
2. Rural	5,486	0.9%	245	141	753	545	737	166	849	626	615	642	169
<b>V. Unused Land</b>	<b>256,240</b>	<b>42.5%</b>	<b>11,166</b>	<b>29,192</b>	<b>16,459</b>	<b>48,390</b>	<b>25,300</b>	<b>24,636</b>	<b>26,600</b>	<b>27,125</b>	<b>7,429</b>	<b>8,668</b>	<b>31,275</b>
1. Flat Area	21,807	3.6%	354	800	1,328	1,140	4,250	1,105	6,131	4,115	1,068	785	732
2. Mountainous Area	205,220	34.1%	5,798	26,985	13,500	45,951	14,937	21,654	18,222	19,114	3,991	5,177	29,890
3. Water Surface	8,271	1.4%	2,391	5	250	38	2,824	123	864	107	79	1,588	3
4. River & Stream	11,671	1.9%	312	1,402	1,381	1,133	897	1,430	999	1,670	964	833	649
5. Rocky Mountain	7,948	1.3%	1,604	-	-	-	2,392	-	384	2,065	1,320	183	-
6. Other	1,322	0.2%	707	-	-	128	-	324	-	55	7	102	-

Source: Data Set of Binh Dinh Land Use General Inventory in 2000 and Land Use Maps of Qui Nhon City and 10 Districts.

**Table B.2 Land Use by Commune of the Study Area in 2000 (1/2)**

(unit: ha)

District/ City Local Administration Unit Ward/ Subtown/ Commune	Total	Agriculture Land										Forest Land	Specialized Land	Residential Land	Unused Land
		Total of Agriculture Land	Annual Crop				Misc. garden	Perenni al crop	Grass-land	Aqua-culture					
			Total	Paddy	Slash Burn	Other									
1 Qui Nhon	21,290 100%	3,284 15%	1,888	1,385	57	446	345	285	0	766	4,686 22%	1,660 8%	742 3%	10,918 51%	
2 An Lao	26,043 100%	218 1%	113	41	0	72	12	93	0	0	19,542 75%	71 0%	3 0%	6,209 24%	
3 Hoai Nhon	- -	- -	-	-	-	-	-	-	-	-	- -	- -	- -	- -	
4 Hoai An	- -	- -	-	-	-	-	-	-	-	-	- -	- -	- -	- -	
5 Phu My	17,036 100%	7,403 43%	5,604	3,291	0	2,313	1,083	355	0	361	830 5%	1,726 10%	302 2%	6,775 40%	
6 Vinh Thanh	70,078 100%	4,284 6%	2,776	858	102	1,816	467	1,038	0	3	39,895 57%	1,097 2%	166 0%	24,636 35%	
7 Phu Cat	54,958 100%	17,187 31%	10,676	7,674	0	3,002	2,273	4,130	0	108	12,798 23%	4,962 9%	724 1%	19,287 35%	
8 Tay Son	70,804 100%	14,314 20%	11,496	5,771	1,286	4,439	1,709	1,108	0	1	25,847 37%	2,842 4%	676 1%	27,125 38%	
9 An Nhon	24,217 100%	11,984 49%	9,428	7,666	0	1,762	1,655	890	4	7	1,365 6%	2,719 11%	721 3%	7,428 31%	
10 Tuy Phuoc	28,487 100%	11,792 41%	9,218	8,141	0	1,077	1,162	411	0	1,001	3,589 13%	3,718 13%	720 3%	8,668 30%	
11 Van Canh	79,797 100%	6,033 8%	4,775	1,005	585	3,185	346	909	0	3	41,353 52%	966 1%	169 0%	31,276 39%	
<b>Total</b>	<b>392,710 100%</b>	<b>76,499 19%</b>	<b>55,974</b>	<b>35,832</b>	<b>2,030</b>	<b>18,112</b>	<b>9,052</b>	<b>9,219</b>	<b>4</b>	<b>2,250</b>	<b>149,905 38%</b>	<b>19,761 5%</b>	<b>4,223 1%</b>	<b>142,322 36%</b>	
Ha Thanh in Qui Nhon	21,290 100%	3,284 15%	1,888	1,385	57	446	345	285	0	766	4,686 22%	1,660 8%	742 3%	10,918 51%	
Ha Thanh in Tuy Phuoc	16,509 100%	4,153 25%	3,029	2,385	0	644	481	384	0	259	3,404 21%	2,071 13%	262 2%	6,619 40%	
Ha Thanh in Van Canh	28,567 100%	4,009 14%	3,300	741	463	2,096	264	444	0	1	9,182 32%	555 2%	126 0%	14,695 51%	
<b>Ha Thanh Total</b>	<b>66,366 100%</b>	<b>11,446 17%</b>	<b>8,217</b>	<b>4,511</b>	<b>520</b>	<b>3,186</b>	<b>1,090</b>	<b>1,113</b>	<b>0</b>	<b>1,026</b>	<b>17,272 26%</b>	<b>4,286 6%</b>	<b>1,130 2%</b>	<b>32,232 49%</b>	
La Tinh in Phu My	17,036 43%	7,403 43%	5,604	3,291	0	2,313	1,083	355	0	361	830 5%	1,726 10%	302 2%	6,775 40%	
La Tinh in Phu Cat	7,229 39%	2,791 39%	2,333	1,827	0	506	330	20	0	108	535 8%	481 8%	148 3%	3,274 3%	
La Tinh Total	24,265 100%	10,194 42%	7,937	5,118	0	2,819	1,413	375	0	469	1,365 6%	2,207 9%	450 2%	10,049 41%	
Kone Basin	302,079 18%	54,859 18%	39,820	26,203	1,510	12,107	6,549	7,731	4	755	131,268 44%	13,268 4%	2,643 1%	100,041 33%	
Kone Basin	301,000 100%	54,900 18%	39,800	26,200	1,500	12,100	6,600	7,700	0	800	131,300 44%	13,300 4%	2,600 1%	98,900 33%	
Ha Thanh Basin	63,000 100%	11,000 17%	8,000	4,500	500	3,000	1,000	1,000	0	1,000	16,300 26%	4,300 7%	1,100 2%	30,300 48%	
La Tinh Basin	24,200 100%	10,200 42%	7,900	5,100	0	2,800	1,400	400	0	500	1,300 5%	2,200 9%	500 2%	10,000 41%	
<b>Total of the Basin</b>	<b>388,200 100%</b>	<b>76,100 20%</b>	<b>55,700</b>	<b>35,800</b>	<b>2,000</b>	<b>17,900</b>	<b>9,000</b>	<b>9,100</b>	<b>0</b>	<b>2,300</b>	<b>148,900 38%</b>	<b>19,800 5%</b>	<b>4,200 1%</b>	<b>139,200 36%</b>	
1 Qui Nhon Tran Quang Dieu Ha Thanh	1,093 100%	378 35%	323	154	12	157	49	5	0	0	71 6%	244 22%	84 8%	316 29%	
2 Qui Nhon Bui Thi Xuan Ha Thanh	4,965 100%	733 15%	406	240	44	122	112	214	0	0	2,192 44%	174 4%	56 1%	1,810 36%	
3 Qui Nhon Dong Da Ha Thanh	625 100%	127 20%	0	0	0	0	4	0	0	123	48 8%	111 18%	68 11%	271 43%	
4 Qui Nhon Thi Nai Ha Thanh	195 100%	0 0%	0	0	0	0	0	0	0	0	0 0%	21 11%	24 12%	150 77%	
5 Qui Nhon Quang Trung Ha Thanh	775 100%	87 11%	33	29	0	4	0	4	0	50	97 13%	162 21%	60 8%	368 47%	
6 Qui Nhon Ghenh Rang Ha Thanh	2,478 100%	119 5%	64	44	0	19	9	44	0	3	580 23%	134 5%	27 1%	1,618 65%	
7 Qui Nhon Ngo May Ha Thanh	140 100%	0 0%	0	0	0	0	0	0	0	0	50 36%	33 24%	49 35%	7 5%	
8 Qui Nhon Nguyen Van Cu Ha Thanh	143 100%	0 0%	0	0	0	0	0	0	0	0	0 0%	94 65%	39 27%	11 7%	
9 Qui Nhon Tran Hung Dao Ha Thanh	47 100%	0 0%	0	0	0	0	0	0	0	0	0 0%	21 45%	20 42%	6 13%	
10 Qui Nhon Le Hong Phong Ha Thanh	105 100%	0 0%	0	0	0	0	0	0	0	0	41 39%	24 23%	29 27%	12 11%	
11 Qui Nhon Ly Thuong Kiet Ha Thanh	69 100%	0 0%	0	0	0	0	0	0	0	0	0 0%	57 83%	12 18%	0 0%	
12 Qui Nhon Tran Phu Ha Thanh	72 100%	0 0%	0	0	0	0	0	0	0	0	0 0%	41 57%	28 39%	2 3%	
13 Qui Nhon Le Loi Ha Thanh	57 100%	0 0%	0	0	0	0	0	0	0	0	0 0%	33 57%	21 37%	3 5%	
14 Qui Nhon Hai Cang Ha Thanh	981 100%	5 1%	0	0	0	0	0	0	0	5	5 1%	91 9%	31 3%	848 86%	
15 Qui Nhon Nhon Binh Ha Thanh	1,468 100%	838 57%	509	489	0	20	50	0	0	278	8 1%	126 9%	48 3%	449 31%	
16 Qui Nhon Nhon Phu Ha Thanh	1,318 100%	633 48%	437	338	1	98	68	10	0	118	56 4%	185 14%	84 6%	361 27%	
17 Qui Nhon Nhon Ly Ha Thanh	1,531 100%	0 0%	0	0	0	0	0	0	0	0	72 5%	32 2%	30 2%	1,397 91%	
18 Qui Nhon Nhon Hai Ha Thanh	1,200 100%	61 5%	23	14	0	8	0	7	0	31	135 11%	26 2%	20 2%	959 80%	
19 Qui Nhon Nhon Hoi Ha Thanh	4,028 100%	301 7%	93	77	0	16	52	0	0	157	1,331 33%	52 1%	13 0%	2,331 58%	
<b>Qui Nhon Total</b>	<b>21,290 100%</b>	<b>3,283 15%</b>	<b>1,888</b>	<b>1,385</b>	<b>57</b>	<b>446</b>	<b>345</b>	<b>285</b>	<b>0</b>	<b>766</b>	<b>4,686 22%</b>	<b>1,660 8%</b>	<b>742 3%</b>	<b>10,918 51%</b>	
5 An Lao An Toan	26,044 100%	219 1%	113	41	0	72	12	93	0	0	19,542 75%	71 0%	3 0%	6,209 24%	
<b>An Lao Total</b>	<b>26,044 100%</b>	<b>219 1%</b>	<b>113</b>	<b>41</b>	<b>0</b>	<b>72</b>	<b>12</b>	<b>93</b>	<b>0</b>	<b>0</b>	<b>19,542 75%</b>	<b>71 0%</b>	<b>3 0%</b>	<b>6,209 24%</b>	
1 Phu My Phu My La Tin	1,110 100%	567 51%	402	309	0	93	126	38	0	0	13 1%	272 24%	48 4%	211 19%	
14 Phu My My Chanh La Tin	4,619 100%	1,639 35%	1,089	646	0	443	194	38	0	317	168 4%	275 6%	71 2%	2,466 53%	
16 Phu My My Quang La Tin	2,028 100%	877 43%	622	385	0	237	137	118	0	0	288 14%	193 10%	31 2%	639 32%	
17 Phu My My Hiep La Tin	5,546 100%	2,123 38%	1,720	1,147	0	572	261	142	0	0	361 7%	634 11%	69 1%	2,359 43%	
18 Phu My My Tai La Tin	2,862 100%	1,704 60%	1,417	519	0	897	273	15	0	0	0 0%	255 9%	54 2%	848 30%	
19 Phu My My Cat La Tin	871 100%	493 57%	354	284	0	70	92	4	0	44	0 0%	97 11%	29 3%	252 29%	
<b>Phu My Total</b>	<b>17,036 100%</b>	<b>7,402 43%</b>	<b>5,604</b>	<b>3,291</b>	<b>0</b>	<b>2,313</b>	<b>1,083</b>	<b>355</b>	<b>0</b>	<b>361</b>	<b>830 5%</b>	<b>1,726 10%</b>	<b>302 2%</b>	<b>6,775 40%</b>	
1 Vinh Thanh Vinh Son	17,145 100%	1,088 6%	529	73	0	456	98	460	0	1	8,902 52%	566 3%	19 0%	6,571 38%	
2 Vinh Thanh Vinh Kim	19,326 100%	336 2%	257	8	0	248	75	5	0	0	12,934 67%	38 0%	20 0%	5,997 31%	
3 Vinh Thanh Vinh Hoa	8,244 100%	407 5%	295	10	67	217	67	45	0	0	5,399 65%	43 1%	9 0%	2,386 29%	
4 Vinh Thanh Vinh Hiep	6,437 100%	351 5%	226	155	0	71	41	82	0	2	4,467 69%	31 0%	17 0%	1,571 24%	
5 Vinh Thanh Vinh Hao	6,017 100%	312 5%	113	14	35	63	30	169	0	0	3,820 63%	63 1%	15 0%	1,806 30%	
6 Vinh Thanh Vinh Quang	6,835 100%	1,125 16%	833	253	0	580	71	220	0	1	1,588 23%	180 3%	51 1%	3,891 57%	
7 Vinh Thanh Vinh Thinh	6,075 100%	666 11%	525	344	0	181	84	57	0	0	2,785 46%	177 3%	33 1%	2,414 40%	
<b>Vinh Thanh Total</b>	<b>70,078 100%</b>	<b>4,285 6%</b>	<b>2,777</b>	<b>858</b>	<b>102</b>	<b>1,816</b>	<b>467</b>	<b>1,038</b>	<b>0</b>	<b>3</b>	<b>39,895 57%</b>	<b>1,097 2%</b>	<b>166 0%</b>	<b>24,636 35%</b>	
1 Phu Cat Ngo May Kone	755 100%	426 56%	265	169	0	96	137	24	0	0	0 0%	148 20%	33 4%	148 20%	
2 Phu Cat Cat Son Kone	11,340 100%	789 7%	301	257	0	44	109	380	0	0	6,608 58%	770 7%	31 0%	3,141 28%	
3 Phu Cat Cat Minh La Tin	2,505 100%	975 39%	707	568	0	139	150	11	0	108	49 2%	218 9%	63 3%	1,201 48%	
4 Phu Cat Cat Tai La Tin	3,870 100%	1,187 31%	1,047	692	0	356	130	10	0	0	486 13%	164 4%	52 1%	1,981 51%	
6 Phu Cat Cat Lam Kone	6,942 100%	2,370 34%	864	372	0	492	232	1,275	0	0	2,377 34%	226 3%	38 1%	1,931 28%	
7 Phu Cat Cat Hanh Kone	4,416 100%	2,063 47%	1,164	878	0	286	328	571	0	0	438 10%	486 11%	80 2%	1,350 31%	
10 Phu Cat Cat Hiep Kone	4,102 100%	2,290 56%	921	532	0	389	265	1,103	0	0	558 14%	243 6%	51 1%	960 23%	
11 Phu Cat Cat Trinh Kone	4,755 100%	1,910 40%	1,153	687	0	466	274	483	0	0	761 16%	390 8%	63 1%	1,630 34%	
12 Phu Cat Cat Nhon Kone	3,855 100%	976 25%	781	648	0	132	88	107	0	0	1,057 27%	284 7%	64 2%	1,474 38%	

**Table B.2 Land Use by Commune of the Study Area in 2000 (2/2)**

(unit: ha)

District/ City Local Administration Unit Ward/ Subtown/ Commune	Total	Agriculture Land										Forest Land	Specialized Land	Residential Land	Unused Land					
		Total of Agriculture Land		Annual Crop				Misc. garden	Perennial crop	Grassland	Aquaculture									
		Total	%	Paddy	Slash Burn	Other	%													
13 Phu Cat Cat Hung Kone	4,114	100%	675	16%	564	446	0	118	57	55	0	0	122	3%	369	9%	44	1%	2,903	71%
14 Phu Cat Cat Tuong Kone	2,914	100%	1,303	45%	1,009	707	0	301	219	75	0	0	129	4%	297	10%	62	2%	1,124	39%
15 Phu Cat Cat Tan Kone	2,802	100%	1,039	37%	803	667	0	136	199	38	0	0	138	5%	1,178	42%	61	2%	386	14%
16 Phu Cat Cat Tien Kone	1,734	100%	555	32%	520	485	0	35	35	0	0	0	75	4%	90	5%	49	3%	965	56%
17 Phu Cat Cat Thang La Tin	853	100%	629	74%	579	567	0	11	51	0	0	0	0	0%	99	12%	33	4%	92	11%
<b>Phu Cat Total</b>	<b>54,957</b>	<b>100%</b>	<b>17,187</b>	<b>31%</b>	<b>10,676</b>	<b>7,674</b>	<b>0</b>	<b>3,002</b>	<b>2,273</b>	<b>4,130</b>	<b>0</b>	<b>108</b>	<b>12,798</b>	<b>23%</b>	<b>4,962</b>	<b>9%</b>	<b>724</b>	<b>1%</b>	<b>19,287</b>	<b>35%</b>
1 Tay Son Phu Phong	379	100%	170	45%	146	103	0	43	25	0	0	0	1	0%	66	17%	50	13%	92	24%
2 Tay Son Binh Tan	11,028	100%	998	9%	603	319	0	284	192	203	0	0	4,843	44%	616	6%	35	0%	4,537	41%
3 Tay Son Tay Thuan	9,719	100%	1,351	14%	1,224	371	0	852	126	1	0	0	2,887	30%	145	1%	51	1%	5,285	54%
4 Tay Son Binh Thuan	4,084	100%	1,868	46%	1,178	600	0	578	381	309	0	0	423	10%	188	5%	37	1%	1,568	38%
5 Tay Son Tay Giang	7,352	100%	1,889	26%	1,737	352	616	769	113	39	0	0	1,686	23%	177	2%	84	1%	3,517	48%
6 Tay Son Binh Thanh	5,532	100%	1,529	28%	896	504	0	392	233	401	0	0	1,565	28%	300	5%	52	1%	2,086	38%
7 Tay Son Tay An	1,044	100%	576	55%	489	479	0	10	85	2	0	0	4	0%	138	13%	26	2%	300	29%
8 Tay Son Binh Hoa	1,380	100%	670	49%	556	496	0	60	78	36	0	0	90	6%	148	11%	47	3%	426	31%
9 Tay Son Binh Tuong	3,770	100%	1,187	31%	999	642	0	357	86	102	0	0	44	1%	220	6%	73	2%	2,245	60%
10 Tay Son Tay Vinh	706	100%	469	66%	402	331	0	71	65	2	0	0	0	0%	142	20%	34	5%	60	9%
11 Tay Son Tay Binh	723	100%	414	57%	357	285	0	72	51	6	0	0	27	4%	58	8%	28	4%	195	27%
12 Tay Son Vinh An	10,420	100%	755	7%	744	21	670	54	10	1	0	0	8,641	83%	8	0%	6	0%	1,009	10%
13 Tay Son Tay Xuan	3,854	100%	422	11%	348	256	0	92	71	3	0	0	1,517	39%	151	4%	36	1%	1,728	45%
14 Tay Son Tay Phu	5,912	100%	705	12%	629	418	0	212	71	4	0	0	2,852	48%	171	3%	44	1%	2,140	36%
15 Tay Son Binh Nghi	4,900	100%	1,309	27%	1,186	593	0	593	121	1	0	1	1,269	26%	313	6%	73	1%	1,936	40%
<b>Tay Son Total</b>	<b>70,803</b>	<b>100%</b>	<b>14,313</b>	<b>20%</b>	<b>11,495</b>	<b>5,771</b>	<b>1,286</b>	<b>4,439</b>	<b>1,709</b>	<b>1,108</b>	<b>0</b>	<b>1</b>	<b>25,847</b>	<b>37%</b>	<b>2,842</b>	<b>4%</b>	<b>676</b>	<b>1%</b>	<b>27,125</b>	<b>38%</b>
1 An Nhon Binh Dinh	612	100%	382	62%	325	292	0	33	53	4	0	0	0%	136	22%	53	9%	41	7%	
2 An Nhon Dap Da	507	100%	335	66%	262	234	0	28	70	3	0	0	0%	87	17%	53	10%	33	6%	
3 An Nhon Nhon Thanh	1,266	100%	708	56%	593	454	0	139	105	10	0	0	0%	140	11%	57	5%	361	29%	
4 An Nhon Nhon My	1,715	100%	1,079	63%	735	676	0	60	194	149	0	0	14	1%	230	13%	58	3%	334	19%
5 An Nhon Nhon Hanh	1,088	100%	877	81%	812	788	0	24	65	0	0	0	0%	140	13%	46	4%	25	2%	
6 An Nhon Nhon Phong	826	100%	635	77%	570	543	0	27	65	1	0	0	0%	117	14%	39	5%	34	4%	
7 An Nhon Nhon Hau	1,225	100%	788	64%	590	409	0	181	176	21	0	0	0%	187	15%	55	5%	195	16%	
8 An Nhon Nhon An	876	100%	697	80%	608	557	0	51	89	0	0	0	0%	118	14%	40	5%	21	2%	
9 An Nhon Nhon Hung	833	100%	601	72%	505	407	0	98	95	0	0	0	0%	139	17%	42	5%	51	6%	
10 An Nhon Nhon Phuc	1,069	100%	679	64%	606	476	0	130	73	0	0	0	0%	125	12%	56	5%	208	19%	
11 An Nhon Nhon Khanh	858	100%	606	71%	523	372	0	151	74	0	4	4	0%	117	14%	37	4%	99	11%	
12 An Nhon Nhon Loc	1,227	100%	807	66%	714	635	0	79	87	6	0	0	29	2%	190	15%	42	3%	159	13%
13 An Nhon Nhon Hoa	2,783	100%	1,104	40%	904	717	0	188	165	34	0	0	50	2%	382	14%	70	3%	1,177	42%
14 An Nhon Nhon Tho	3,201	100%	1,216	38%	890	655	0	235	159	167	0	0	323	10%	185	6%	38	1%	1,439	45%
15 An Nhon Nhon Tan	6,133	100%	1,472	24%	789	452	0	337	184	496	0	3	950	15%	424	7%	34	1%	3,253	53%
<b>An Nhon Total</b>	<b>24,218</b>	<b>100%</b>	<b>11,984</b>	<b>49%</b>	<b>9,428</b>	<b>7,666</b>	<b>0</b>	<b>1,762</b>	<b>1,655</b>	<b>890</b>	<b>4</b>	<b>7</b>	<b>1,365</b>	<b>6%</b>	<b>2,719</b>	<b>11%</b>	<b>721</b>	<b>3%</b>	<b>7,428</b>	<b>31%</b>
1 Tuy Phuoc Tuy Phuoc	636	100%	398	63%	350	333	0	17	45	3	0	0	12	2%	102	16%	33	5%	91	14%
2 Tuy Phuoc Dieu Tri	547	100%	281	51%	246	217	0	28	35	0	0	0	3	1%	95	17%	45	8%	123	22%
3 Tuy Phuoc Phuoc Thang	1,379	100%	1,003	73%	902	889	0	13	50	0	0	50	0%	124	9%	37	3%	215	16%	
4 Tuy Phuoc Phuoc Hung	1,015	100%	790	78%	715	675	0	40	75	0	0	0	0%	130	13%	50	5%	45	4%	
5 Tuy Phuoc Phuoc Hoa	1,999	100%	1,048	52%	596	547	0	49	72	5	0	376	76	4%	223	11%	49	2%	603	30%
6 Tuy Phuoc Phuoc Quang	1,081	100%	788	73%	705	665	0	40	80	3	0	0	0%	190	18%	50	5%	53	5%	
7 Tuy Phuoc Phuoc Son	2,584	100%	1,682	65%	1,235	1,208	0	27	124	8	0	315	16	1%	272	11%	79	3%	535	21%
8 Tuy Phuoc Phuoc Hiep	1,571	100%	978	62%	868	710	0	158	107	3	0	0	38	2%	302	19%	66	4%	187	12%
9 Tuy Phuoc Phuoc Loc	1,165	100%	671	58%	571	510	0	61	93	6	0	0	40	3%	210	18%	48	4%	197	17%
10 Tuy Phuoc Phuoc Thuan Ha Thanh	2,163	100%	950	44%	633	619	0	14	54	3	0	259	27	1%	176	8%	52	2%	959	44%
11 Tuy Phuoc Phuoc Nghia Ha Thanh	680	100%	324	48%	279	271	0	8	43	2	0	0	17	3%	94	14%	27	4%	218	32%
12 Tuy Phuoc Phuoc An Ha Thanh	3,351	100%	1,328	40%	1,113	849	0	264	152	63	0	0	81	2%	625	19%	98	3%	1,218	36%
13 Tuy Phuoc Phuoc Thanh Ha Thanh	3,505	100%	885	25%	627	396	0	231	107	151	0	0	148	4%	870	25%	59	2%	1,543	44%
14 Tuy Phuoc Phuoc My Ha Thanh	6,810	100%	667	10%	378	251	0	127	125	164	0	0	3,131	46%	306	4%	25	0%	2,681	39%
<b>Tuy Phuoc Total</b>	<b>28,486</b>	<b>100%</b>	<b>11,792</b>	<b>41%</b>	<b>9,218</b>	<b>8,141</b>	<b>0</b>	<b>1,077</b>	<b>1,162</b>	<b>411</b>	<b>0</b>	<b>1,001</b>	<b>3,589</b>	<b>13%</b>	<b>3,718</b>	<b>13%</b>	<b>720</b>	<b>3%</b>	<b>8,668</b>	<b>30%</b>
1 Van Canh Van Canh	0		0		0															
2 Van Canh Canh Hiep	13,002	100%	1,195	9%	656	43	122	490	73	465	0	1	6,651	51%	77	1%	30	0%	5,049	39%
3 Van Canh Canh Lien	38,228	100%	830	2%	820	221	0	599	9	0	0	1	25,520	67%	334	1%	13	0%	11,532	30%
4 Van Canh Canh Vinh Ha Thanh	9,954	100%	1,555	16%	1,197	404	356	437	127	231	0	0	2,844	29%	312	3%	67	1%	5,177	52%
5 Van Canh Canh Hien Ha Thanh	3,680	100%	575	16%	329	118	29	182	41	205	0	0	1,477	40%	69	2%	15	0%	1,544	42%
6 Van Canh Canh Thuan Ha Thanh	9,711	100%	1,300	13%	1,217	164	0	1,054	73	8	0	1	3,217	33%	132	1%	35	0%	5,026	52%
7 Van Canh Canh Hoa Ha Thanh	5,223	100%	579	11%	557	55	79	424	23	0	0	0	1,644	31%	42	1%	9	0%	2,949	56%
<b>Van Canh Total</b>	<b>79,798</b>	<b>100%</b>	<b>6,034</b>	<b>8%</b>	<b>4,776</b>	<b>1,005</b>	<b>585</b>	<b>3,185</b>	<b>346</b>	<b>909</b>	<b>0</b>	<b>3</b>	<b>41,353</b>	<b>52%</b>	<b>966</b>	<b>1%</b>	<b>169</b>	<b>0%</b>	<b>31,276</b>	<b>39%</b>

Note: Local administration units in the river basin are identified based on the topographic maps (scaled at 1:25,000 and 1:50,000) and land use maps attached to the source.

- Administrative boundary Map (1:130,000)

- Topographic Maps (1:50,000 & 1:25,000)

- Land Use Maps of each District, at the following scales:

1:50,000 for 1 city of Qui Nhon

1:75,000 for 3 districts of Hoai Nhon, 09 An Nhon, 10 Tuy Phuoc

1:100,000 for 7 districts of 02 An Lao, 04 Hoai An, 05 Phu My, 06 Vinh Thanh, 07 Phu Cat, 08 Tay Son, 11 Van Canh

Source: Data Set of Binh Dinh Land Use General Inventory in 2000 and Land Use Maps of Qui Nhon City and 10 Districts.

**Table B.3 Gross Regional Domestic Product of Binh Dinh Province****(1) Gross Regional Domestic Product at Current Price**

(unit: million VND)

Economic Sector	1995		1999		2000		2001		Annual Growth Rate
1. Agriculture, Forestry & fishery	1,388,417	51.1%	1,888,927	45.2%	1,840,511	41.0%	2,007,142	40.8%	6.3%
2. Industry, Construction	406,792	15.0%	810,132	19.4%	1,036,766	23.1%	1,160,352	23.6%	19.1%
3. Others	922,455	33.9%	1,482,212	35.4%	1,614,655	35.9%	1,750,029	35.6%	11.3%
<b>Total</b>	<b>2,717,664</b>	<b>100%</b>	<b>4,181,271</b>	<b>100%</b>	<b>4,491,932</b>	<b>100%</b>	<b>4,917,523</b>	<b>100%</b>	<b>10.4%</b>

**(2) Gross Regional Domestic Product at Constant 1994 Prices**

(unit: million VND)

Economic Sector	1995		1999		2000		2001		Annual Growth Rate
1. Agriculture	928,824	38.9%	1,265,295	37.7%	1,325,594	36.2%	1,354,763	35.0%	6.5%
2. Forestry	74,031	3.1%	64,282	1.9%	70,878	1.9%	76,447	2.0%	0.5%
3. Fishery	229,495	9.6%	337,905	10.1%	345,201	9.4%	374,365	9.7%	8.5%
<b>Sub-total</b>	<b>1,232,350</b>	<b>51.6%</b>	<b>1,667,482</b>	<b>49.6%</b>	<b>1,741,673</b>	<b>47.6%</b>	<b>1,805,575</b>	<b>46.6%</b>	<b>6.6%</b>
4. Mining & Quarrying	11,146	0.5%	22,779	0.7%	28,367	0.8%	31,434	0.8%	18.9%
5. Manufacturing	133,766	5.6%	319,513	9.5%	444,694	12.1%	468,833	12.1%	23.2%
6. Electricity & Water Supply	35,424	1.5%	38,211	1.1%	42,111	1.2%	48,331	1.2%	5.3%
7. Construction	173,881	7.3%	199,291	5.9%	207,263	5.7%	228,333	5.9%	4.6%
<b>Sub-total</b>	<b>354,217</b>	<b>14.8%</b>	<b>579,794</b>	<b>17.3%</b>	<b>722,435</b>	<b>19.7%</b>	<b>776,931</b>	<b>20.1%</b>	<b>14.0%</b>
8. Wholesale & Retail, Repair	169,079	7.1%	241,732	7.2%	259,084	7.1%	277,406	7.2%	8.6%
9. Hotels & Restaurants	39,184	1.6%	50,338	1.5%	53,617	1.5%	60,137	1.6%	7.4%
10. Others	593,868	24.9%	819,994	24.4%	884,528	24.2%	953,903	24.6%	8.2%
<b>Sub-total</b>	<b>802,131</b>	<b>33.6%</b>	<b>1,112,064</b>	<b>33.1%</b>	<b>1,197,229</b>	<b>32.7%</b>	<b>1,291,446</b>	<b>33.3%</b>	<b>8.3%</b>
<b>Total</b>	<b>2,388,698</b>	<b>100%</b>	<b>3,359,340</b>	<b>100%</b>	<b>3,661,337</b>	<b>100%</b>	<b>3,873,952</b>	<b>100%</b>	<b>8.4%</b>

Source: Statistical Yearbook 2001, Binh Dinh Province.

**(2) Gross Output of Binh Dinh Province, at constant 1994 prices**

(unit: million VND)

Economic Sector	1995		1999		2000		2001		Annual Growth Rate
1. Agriculture	1,595,693	38.0%	2,032,246	33.3%	2,127,760	30.8%	2,174,572	29.6%	5.3%
2. Forestry	102,238	2.4%	91,319	1.5%	98,441	1.4%	106,120	1.4%	0.6%
3. Fishery	372,448	8.9%	565,783	9.3%	669,321	9.7%	723,536	9.9%	11.7%
<b>Sub-total</b>	<b>2,070,379</b>	<b>49.3%</b>	<b>2,689,348</b>	<b>44.1%</b>	<b>2,895,522</b>	<b>41.9%</b>	<b>3,004,228</b>	<b>40.9%</b>	<b>6.4%</b>
4. Mining & Quarrying	16,248	0.4%	44,569	0.7%	55,622	0.8%	60,152	0.8%	24.4%
5. Manufacturing	426,437	10.2%	1,001,257	16.4%	1,443,812	20.9%	1,527,861	20.8%	23.7%
6. Electricity & Water Supply	56,402	1.3%	60,960	1.0%	67,056	1.0%	76,963	1.0%	5.3%
7. Construction	578,570	13.8%	648,012	10.6%	673,932	9.7%	748,480	10.2%	4.4%
<b>Sub-total</b>	<b>1,077,657</b>	<b>25.7%</b>	<b>1,754,798</b>	<b>28.8%</b>	<b>2,240,422</b>	<b>32.4%</b>	<b>2,413,456</b>	<b>32.9%</b>	<b>14.4%</b>
8. Wholesale & Retail, Repair	260,616	6.2%	380,313	6.2%	403,132	5.8%	432,158	5.9%	8.8%
9. Hotels & Restaurants	71,878	1.7%	156,683	2.6%	170,001	2.5%	187,171	2.5%	17.3%
10. Others	718,331	17.1%	1,116,723	18.3%	1,206,695	17.4%	1,305,569	17.8%	10.5%
<b>Sub-total</b>	<b>1,050,825</b>	<b>25.0%</b>	<b>1,653,719</b>	<b>27.1%</b>	<b>1,779,828</b>	<b>25.7%</b>	<b>1,924,898</b>	<b>26.2%</b>	<b>10.6%</b>
<b>Total</b>	<b>4,198,861</b>	<b>100%</b>	<b>6,097,865</b>	<b>100%</b>	<b>6,915,772</b>	<b>100%</b>	<b>7,342,582</b>	<b>100%</b>	<b>9.8%</b>

Source: Statistical Yearbook 2001, Binh Dinh Province.



**Table B.4 Industrial Gross Output (at constant 1994 prices)**

**(1) by Economic Activities**

(unit: million VND)

Activities	1995		1999		2000		2001		Annual Growth Rate
<b>Agri-Base Industries</b>									
Manufacture, Food & Beverage	189,371	36.3%	550,625	46.0%	741,228	43.9%	741,385	41.2%	25.5%
Leather Tanning & Processing	13,071	2.5%	33,591	2.8%	48,738	2.9%	57,669	3.2%	28.1%
Wood Processing & Products	45,774	8.8%	85,249	7.1%	89,337	5.3%	103,183	5.7%	14.5%
Paper paper products	944	0.2%	9,827	0.8%	25,905	1.5%	33,068	1.8%	80.9%
Furnitures	20,147	3.9%	136,981	11.5%	256,279	15.2%	205,189	11.4%	47.2%
<b>Sub-total (agri-base)</b>	<b>269,307</b>	<b>51.7%</b>	<b>816,273</b>	<b>68.3%</b>	<b>1,161,487</b>	<b>68.8%</b>	<b>1,140,494</b>	<b>63.4%</b>	<b>27.2%</b>
<b>Other Industries</b>									
Mining of Metal Ores	1,148	0.2%	7,172	0.6%	6,590	0.4%	7,249	0.4%	36.0%
Quarrying of Stone & mining	27,292	5.2%	32,170	2.7%	41,931	2.5%	46,640	2.6%	9.3%
Manufacture, Textile	12,013	2.3%	7,843	0.7%	8,019	0.5%	10,908	0.6%	-1.6%
Manufacture, Wearing Apparel	14,125	2.7%	17,700	1.5%	20,451	1.2%	17,949	1.0%	4.1%
Publication, Printing	5,206	1.0%	14,091	1.2%	15,216	0.9%	17,374	1.0%	22.2%
Manufacture, Chemical	29,666	5.7%	42,937	3.6%	69,510	4.1%	96,713	5.4%	21.8%
Manufacture, Rubber	2,306	0.4%	785	0.1%	3,119	0.2%	10,802	0.6%	29.4%
Manufacture, Non-metallic Mineral	68,664	13.2%	83,078	6.9%	118,432	7.0%	134,374	7.5%	11.8%
Manufacture, Basic Metal	-	-	215	0.0%	667	0.0%	1,110	0.1%	127.2%
Metal Products	16,796	3.2%	23,028	1.9%	26,541	1.6%	30,762	1.7%	10.6%
Manufacture, Machinery	6,738	1.3%	3,145	0.3%	4,494	0.3%	5,325	0.3%	-3.8%
Assembl. & Repar., Vehicles	4,001	0.8%	1,689	0.1%	2,641	0.2%	4,250	0.2%	1.0%
Assembl. & Repar., Non-vehicle	6,318	1.2%	32,454	2.7%	75,238	4.5%	122,854	6.8%	64.0%
Reproduction	-	-	65	0.0%	65	0.0%	68	0.0%	2.3%
Electricity Produc. & Distrib.	53,217	10.2%	107,860	9.0%	128,017	7.6%	147,302	8.2%	18.5%
Water Supply	4,336	0.8%	5,423	0.5%	5,496	0.3%	5,962	0.3%	5.5%
<b>Sub-total (non-agri-base)</b>	<b>251,826</b>	<b>48.3%</b>	<b>379,655</b>	<b>31.7%</b>	<b>526,427</b>	<b>31.2%</b>	<b>659,642</b>	<b>36.6%</b>	<b>17.4%</b>
<b>Total</b>	<b>521,133</b>	<b>100%</b>	<b>1,195,928</b>	<b>100%</b>	<b>1,687,914</b>	<b>100%</b>	<b>1,800,136</b>	<b>100%</b>	<b>22.9%</b>

Source: Statistical Yearbook 2001, Binh Dinh Province.

**(2) by Economic Ownership**

(unit: million VND)

Economic Ownership	1995		1999		2000		2001		Annual Growth Rate
<b>Local Industry</b>									
1. State	167,879	32.2%	604,681	50.6%	798,641	47.3%	856,640	47.6%	31.2%
2. Collective	13,536	2.6%	10,185	0.9%	10,398	0.6%	8,866	0.5%	-6.8%
3. Private	5,355	1.0%	48,606	4.1%	70,910	4.2%	49,375	2.7%	44.8%
4. Mixed	4,333	0.8%	103,678	8.7%	266,765	15.8%	262,184	14.6%	98.1%
5. Household	247,862	47.6%	290,112	24.3%	319,424	18.9%	346,936	19.3%	5.8%
<b>Sub-total</b>	<b>438,965</b>	<b>84.2%</b>	<b>1,057,262</b>	<b>88.4%</b>	<b>1,466,138</b>	<b>86.9%</b>	<b>1,524,001</b>	<b>84.7%</b>	<b>23.1%</b>
<b>Central Industry</b>	<b>70,308</b>	<b>13.5%</b>	<b>129,425</b>	<b>10.8%</b>	<b>216,754</b>	<b>12.8%</b>	<b>271,184</b>	<b>15.1%</b>	<b>25.2%</b>
<b>Foreign Investment</b>	<b>11,860</b>	<b>2.3%</b>	<b>9,241</b>	<b>0.8%</b>	<b>5,022</b>	<b>0.3%</b>	<b>4,951</b>	<b>0.3%</b>	<b>-13.5%</b>
<b>Total</b>	<b>521,133</b>	<b>100%</b>	<b>1,195,928</b>	<b>100%</b>	<b>1,687,914</b>	<b>100%</b>	<b>1,800,136</b>	<b>100%</b>	<b>22.9%</b>

Source: Statistical Yearbook 2001, Binh Dinh Province.

**Table B.5 Population and Household in Urban and Rural Area**

City and District	Household						Population						Family Size		
	Total		Urban		Rural		Total		Urban		Rural		Total	Urban	Rural
01 Quy Nhon	50,939	16.1%	46,997	92.3%	3,942	7.7%	238,290	16.3%	218,484	91.7%	19,806	8.3%	4.68	4.65	5.02
	(100.0%)		(92.3%)		(7.7%)	(100.0%)		(91.7%)		(8.3%)					
02 An Lao	4,660	1.5%	-	-	4,660	100.0%	22,982	1.6%	-	-	22,982	100.0%	4.93	-	4.93
	(100.0%)		-		(100.0%)		(100.0%)		-		(100.0%)				
03 Noai Nhon	46,057	14.6%	6,602	14.3%	39,455	85.7%	209,008	14.3%	29,697	14.2%	179,311	85.8%	4.54	4.50	4.54
	(100.0%)		(14.3%)		(85.7%)	(100.0%)		(14.2%)		(85.8%)					
04 Hoai An	19,815	6.3%	1,688	8.5%	18,127	91.5%	90,993	6.2%	7,017	7.7%	83,976	92.3%	4.59	4.16	4.63
	(100.0%)		(8.5%)		(91.5%)	(100.0%)		(7.7%)		(92.3%)					
05 Phu My	37,370	11.8%	2,499	6.7%	34,871	93.3%	177,702	12.2%	11,326	6.4%	166,376	93.6%	4.76	4.53	4.77
	(100.0%)		(6.7%)		(93.3%)	(100.0%)		(6.4%)		(93.6%)					
06 Vinh Thanh	5,463	1.7%	-	-	5,463	100.0%	25,671	1.8%	-	-	25,671	100.0%	4.70	-	4.70
	(100.0%)		-		(100.0%)		(100.0%)		-		(100.0%)				
07 Phu Cat	39,688	12.5%	2,471	6.2%	37,217	93.8%	184,439	12.6%	10,672	5.8%	173,767	94.2%	4.65	4.32	4.67
	(100.0%)		(6.2%)		(93.8%)	(100.0%)		(5.8%)		(94.2%)					
08 Tay Son	28,454	9.0%	2,814	9.9%	25,640	90.1%	129,962	8.9%	12,787	9.8%	117,175	90.2%	4.57	4.54	4.57
	(100.0%)		(9.9%)		(90.1%)	(100.0%)		(9.8%)		(90.2%)					
09 An Nhon	40,533	12.8%	7,628	18.8%	32,905	81.2%	179,829	12.3%	34,646	19.3%	145,183	80.7%	4.44	4.54	4.41
	(100.0%)		(18.8%)		(81.2%)	(100.0%)		(19.3%)		(80.7%)					
10 Tuy Phuoc	38,764	12.3%	5,065	13.1%	33,699	86.9%	180,481	12.4%	23,665	13.1%	156,816	86.9%	4.66	4.67	4.65
	(100.0%)		(13.1%)		(86.9%)	(100.0%)		(13.1%)		(86.9%)					
11 Van Canh	4,654	1.5%	-	-	4,654	100.0%	21,370	1.5%	-	-	21,370	100.0%	4.59	-	4.59
	(100.0%)		-		(100.0%)		(100.0%)		-		(100.0%)				
<b>Total</b>	<b>316,397</b>	<b>100.0%</b>	<b>75,764</b>	<b>23.9%</b>	<b>240,633</b>	<b>76.1%</b>	<b>1,460,727</b>	<b>100.0%</b>	<b>348,294</b>	<b>23.8%</b>	<b>1,112,433</b>	<b>76.2%</b>	<b>4.62</b>	<b>4.60</b>	<b>4.62</b>
	(100.0%)		(23.9%)		(76.1%)	(100.0%)	(100.0%)	(23.8%)		(76.2%)					

Source: Population Census 1999, Binh Dinh Province.

**Table B.6 Employment Status by Sector in District in 1999 (Population Census 1999)**

(unit: persons)

Sector	Province Total		District										
			Quy Nhon	An Lao	Hoai Nhon	Hoai An	Phu My	Vunh Thanh	Phu Cat	Tay Son	An Nhon	Tuy Phuoc	Van Canh
A. Agriculture & Fishery	488,401	69.0%	14,844	9,584	68,103	40,145	70,104	11,119	76,172	55,090	65,510	69,279	8,451
B. Fishery	31,089	4.4%	9,556	48	10,880	82	5,405	11	2,811	25	130	2,138	3
<b>Sub-total</b>	<b>519,490</b>	<b>73.3%</b>	<b>24,400</b>	<b>9,632</b>	<b>78,983</b>	<b>40,227</b>	<b>75,509</b>	<b>11,130</b>	<b>78,983</b>	<b>55,115</b>	<b>65,640</b>	<b>71,417</b>	<b>8,454</b>
			25.6%	86.6%	76.7%	86.5%	86.9%	88.6%	85.1%	81.8%	71.6%	78.7%	83.2%
C. Industry & Mining	7,546	1.1%	2,041	25	284	16	1,887	-	1,698	66	175	1,346	8
D. Processing & Manufacturing	50,804	7.2%	18,512	221	7,131	1,657	2,248	187	3,161	4,082	8,228	5,119	258
E. Electricity & Gas	900	0.1%	622	9	40	27	30	13	12	31	60	55	1
F. Construction	17,442	2.5%	5,654	51	1,940	386	291	15	1,149	1,066	3,732	3,045	113
<b>Sub-total</b>	<b>76,692</b>	<b>10.8%</b>	<b>26,829</b>	<b>306</b>	<b>9,395</b>	<b>2,086</b>	<b>4,456</b>	<b>215</b>	<b>6,020</b>	<b>5,245</b>	<b>12,195</b>	<b>9,565</b>	<b>380</b>
			28.1%	2.8%	9.1%	4.5%	5.1%	1.7%	6.5%	7.8%	13.3%	10.5%	3.7%
G. Vehicle & Furniture	42,894	6.1%	17,101	217	7,148	1,131	2,459	191	2,539	2,392	5,916	3,529	271
H. Hotel & Restaurant	8,417	1.2%	4,099	61	1,282	161	280	23	420	448	875	698	70
I. Transportation & Storage	15,009	2.1%	7,863	74	1,765	255	733	61	596	878	1,762	882	140
J. Finance & Credit	952	0.1%	547	7	59	28	36	4	51	51	88	78	3
K. Science & Teacher	200	0.0%	81	6	8	1	2	5	6	7	44	40	-
L. Service (consulting)	947	0.1%	625	2	62	22	17	-	43	52	77	45	2
M. Government Management Services	14,808	2.1%	3,979	326	936	1,157	1,330	384	1,661	1,124	1,823	1,689	399
N. Education & Training	14,491	2.0%	3,493	313	1,735	885	1,291	366	1,688	1,233	1,729	1,499	259
O. Medical & Social Services	4,964	0.7%	2,172	93	531	236	303	78	352	324	440	360	75
P. Culture & Sport	1,064	0.2%	584	16	65	35	30	18	59	64	109	67	17
Q. Political Party & Organization	2,314	0.3%	610	46	237	109	193	59	198	181	255	365	61
T. Service for Individuals & Community	5,745	0.8%	2,987	20	668	125	218	22	238	284	655	498	30
U. Maid	233	0.0%	70	5	96	24	13	-	3	4	10	8	-
V. Activities for Organization	3	0.0%	3	-	-	-	-	-	-	-	-	-	-
Others	18	0.0%	11	-	2	-	-	-	1	1	2	1	-
<b>Sub-total</b>	<b>112,059</b>	<b>15.8%</b>	<b>44,225</b>	<b>1,186</b>	<b>14,594</b>	<b>4,169</b>	<b>6,905</b>	<b>1,211</b>	<b>7,855</b>	<b>7,043</b>	<b>13,785</b>	<b>9,759</b>	<b>1,327</b>
			46.3%	10.7%	14.2%	9.0%	7.9%	9.6%	8.5%	10.4%	15.0%	10.8%	13.1%
<b>Total</b>	<b>708,241</b>	<b>100%</b>	<b>95,454</b>	<b>11,124</b>	<b>102,972</b>	<b>46,482</b>	<b>86,870</b>	<b>12,556</b>	<b>92,858</b>	<b>67,403</b>	<b>91,620</b>	<b>90,741</b>	<b>10,161</b>
			100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Population Census 1999, Binh Dinh Province.

**Table B.7 Employment Status by Economic Entities in 1999 (Population Census 1999)**

(unit: persons)

Sector	Economic Entities															
	Province Total		Government		Collective		Private		Individuals		Mixed		Foreign		Other	
A. Agriculture & Fishery	488,401	100%	855	0.2%	452,773	92.7%	84	0.0%	34,660	7.1%	13	0.0%	11	0.0%	5	0.0%
B. Fishery	31,089	100%	163	0.5%	560	1.8%	46	0.1%	30,317	97.5%	3	0.0%	-	-	-	-
<b>Sub-total</b>	<b>519,490</b>	<b>100%</b>	<b>1,018</b>	<b>0.2%</b>	<b>453,333</b>	<b>87.3%</b>	<b>130</b>	<b>0.0%</b>	<b>64,977</b>	<b>12.5%</b>	<b>16</b>	<b>0.0%</b>	<b>11</b>	<b>0.0%</b>	<b>5</b>	<b>0.0%</b>
	73.3%		1.9%		98.0%		3.7%		35.0%		0.6%		8.3%		100.0%	
C. Industry & Mining	7,546	100%	888	11.8%	3,963	52.5%	55	0.7%	2,501	33.1%	105	1.4%	34	0.5%	-	-
D. Processing & Manufacturing	50,804	100%	7,763	15.3%	829	1.6%	2,233	4.4%	37,979	74.8%	1,935	3.8%	65	0.1%	-	-
E. Electricity & Gas	900	100%	870	96.7%	7	0.8%	-	-	21	2.3%	-	-	2	0.2%	-	-
F. Construction	17,442	100%	2,604	14.9%	36	0.2%	242	1.4%	14,232	81.6%	327	1.9%	1	0.0%	-	-
<b>Sub-total</b>	<b>76,692</b>	<b>100%</b>	<b>12,125</b>	<b>15.8%</b>	<b>4,835</b>	<b>6.3%</b>	<b>2,530</b>	<b>3.3%</b>	<b>54,733</b>	<b>71.4%</b>	<b>2,367</b>	<b>3.1%</b>	<b>102</b>	<b>0.1%</b>	<b>0</b>	<b>0.0%</b>
	10.8%		22.6%		1.0%		72.1%		29.4%		91.4%		77.3%		0.0%	
G. Vehicle & Furniture	42,894	100%	1,203	2.8%	30	0.1%	465	1.1%	41,129	95.9%	64	0.1%	3	0.0%	-	-
H. Hotel & Restaurant	8,417	100%	393	4.7%	4	0.0%	57	0.7%	7,954	94.5%	8	0.1%	1	0.0%	-	-
I. Transportation & Storage	15,009	100%	2,733	18.2%	2,614	17.4%	186	1.2%	9,369	62.4%	105	0.7%	2	0.0%	-	-
J. Finance & Credit	952	100%	828	87.0%	115	12.1%	-	-	7	0.7%	2	0.2%	-	-	-	-
K. Science & Teacher	200	100%	198	99.0%	-	-	-	-	2	1.0%	-	-	-	-	-	-
L. Service (consulting)	947	100%	425	44.9%	5	0.5%	20	2.1%	468	49.4%	27	2.9%	2	0.2%	-	-
M. Government Management Services	14,808	100%	14,793	99.9%	15	0.1%	-	-	-	-	-	-	-	-	-	-
N. Education & Training	14,491	100%	13,535	93.4%	795	5.5%	56	0.4%	103	0.7%	1	0.0%	1	0.0%	-	-
O. Medical & Social Services	4,964	100%	3,646	73.4%	71	1.4%	21	0.4%	1,222	24.6%	-	-	4	0.1%	-	-
P. Culture & Sport	1,064	100%	622	58.5%	9	0.8%	16	1.5%	417	39.2%	-	-	-	-	-	-
Q. Political Party & Organization	2,314	100%	1,766	76.3%	547	23.6%	-	-	1	0.0%	-	-	-	-	-	-
T. Service for Individuals & Community	5,745	100%	449	7.8%	28	0.5%	26	0.5%	5,241	91.2%	1	0.0%	-	-	-	-
U. Maid	233	100%	1	0.4%	1	0.4%	3	1.3%	228	97.9%	-	-	-	-	-	-
V. Activities for Organization	3	100%	-	-	-	-	-	-	-	-	-	-	3	100.0%	-	-
Others	18	100%	4	22.2%	1	5.6%	1	5.6%	9	50.0%	-	-	3	16.7%	-	-
<b>Sub-total</b>	<b>112,059</b>	<b>100%</b>	<b>40,596</b>	<b>36.2%</b>	<b>4,235</b>	<b>3.8%</b>	<b>851</b>	<b>0.8%</b>	<b>66,150</b>	<b>59.0%</b>	<b>208</b>	<b>0.2%</b>	<b>19</b>	<b>0.0%</b>	<b>0</b>	<b>0.0%</b>
	15.8%		75.5%		0.9%		24.2%		35.6%		8.0%		14.4%		0.0%	
<b>Total</b>	<b>708,241</b>	<b>100%</b>	<b>53,739</b>	<b>7.6%</b>	<b>462,403</b>	<b>65.3%</b>	<b>3,511</b>	<b>0.5%</b>	<b>185,860</b>	<b>26.2%</b>	<b>2,591</b>	<b>0.4%</b>	<b>132</b>	<b>0.0%</b>	<b>5</b>	<b>0.0%</b>
	100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%	

Source: Population Census 1999, Binh Dinh Province.

**Table B.8 Gross Output of Agriculture Sector in Binh Dinh Province  
(at constant 1994 price)**

(unit: million VND)

Sub-Sectors	1995	1999	2000	2001	Annual Growth Rate
<b>1. Agriculture</b>					
<b>1.1 Crop</b>	<b>997,632 56.8%</b>	<b>1,328,455 59.8%</b>	<b>1,397,287 58.6%</b>	<b>1,423,900 57.7%</b>	<b>6.1%</b>
- Cereal Grain	678,543 38.6%	854,314 38.4%	889,822 37.3%	935,313 37.9%	5.5%
- Tuber	36,711 2.1%	56,509 2.5%	55,104 2.3%	56,706 2.3%	7.5%
- Vegetables & Beans	38,409 2.2%	81,399 3.7%	93,265 3.9%	98,298 4.0%	17.0%
- Industrial Crops	124,017 7.1%	208,223 9.4%	230,446 9.7%	201,686 8.2%	8.4%
- Fruit Crops	15,881 0.9%	23,449 1.1%	24,232 1.0%	26,510 1.1%	8.9%
- Others	1,859 0.1%	3,255 0.1%	3,621 0.2%	4,414 0.2%	15.5%
- Auxiliary Cultivation	102,212 5.8%	101,306 4.6%	100,797 4.2%	100,973 4.1%	-0.2%
<b>1.2 Animal Husbandry</b>	<b>327,378 18.6%</b>	<b>369,834 16.6%</b>	<b>386,502 16.2%</b>	<b>392,963 15.9%</b>	<b>3.1%</b>
- Domestic Animal	194,719 11.1%	230,353 10.4%	239,624 10.0%	247,085 10.0%	4.0%
- Poultry	23,149 1.3%	30,180 1.4%	33,356 1.4%	33,356 1.4%	6.3%
- Other Livestock	- -	5,955 0.3%	4,528 0.2%	4,528 0.2%	-
- Non-meat Products	79,196 4.5%	76,047 3.4%	82,409 3.5%	81,409 3.3%	0.5%
- Subproducts	24,671 1.4%	25,234 1.1%	25,163 1.1%	25,163 1.0%	0.3%
- Hunt & Tame Animal	5,643 0.3%	2,065 0.1%	1,422 0.1%	1,422 0.1%	-20.5%
<b>1.3 Agriculture Services</b>	<b>21,725 1.2%</b>	<b>40,924 1.8%</b>	<b>42,674 1.8%</b>	<b>44,820 1.8%</b>	<b>12.8%</b>
<b>Sub-total</b>	<b>1,346,735 76.6%</b>	<b>1,739,213 78.3%</b>	<b>1,826,463 76.6%</b>	<b>1,861,683 75.5%</b>	<b>5.5%</b>
<b>2. Forestry</b>					
2.1 Afforestation	27,632 1.6%	17,946 0.8%	16,916 0.7%	23,777 1.0%	-2.5%
2.2 Forest Product	63,416 3.6%	58,989 2.7%	66,609 2.8%	67,603 2.7%	1.1%
2.3 Subproducts	862 0.0%	591 0.0%	652 0.0%	647 0.0%	-4.7%
2.4 Forestry Services	12,517 0.7%	15,926 0.7%	16,599 0.7%	16,602 0.7%	4.8%
<b>Sub-total</b>	<b>104,427 5.9%</b>	<b>93,452 4.2%</b>	<b>100,776 4.2%</b>	<b>108,629 4.4%</b>	<b>0.7%</b>
<b>3. Fishery</b>					
<b>3.1 Aquaculture</b>	<b>30,027 1.7%</b>	<b>56,747 2.6%</b>	<b>99,523 4.2%</b>	<b>106,860 4.3%</b>	<b>23.6%</b>
- Fish Aquaculture	4,900 0.3%	7,049 0.3%	6,010 0.3%	5,970 0.2%	3.3%
- Shrimp Aquaculture	25,127 1.4%	49,698 2.2%	93,513 3.9%	100,890 4.1%	26.1%
<b>3.2 Catch</b>	<b>276,677 15.7%</b>	<b>331,624 14.9%</b>	<b>354,738 14.9%</b>	<b>383,368 15.5%</b>	<b>5.6%</b>
- Fish Catch	273,549 15.6%	320,285 14.4%	339,081 14.2%	367,529 14.9%	5.0%
- Shrimp Catch	3,128 0.2%	11,339 0.5%	15,657 0.7%	15,839 0.6%	31.0%
<b>3.3 Fishery Services</b>	<b>- 0.0%</b>	<b>1,329 0.1%</b>	<b>4,436 0.2%</b>	<b>6,305 0.3%</b>	<b>-</b>
<b>Sub-total</b>	<b>306,704 17.4%</b>	<b>389,700 17.5%</b>	<b>458,697 19.2%</b>	<b>496,533 20.1%</b>	<b>8.4%</b>
<b>Total</b>	<b>1,757,866 100%</b>	<b>2,222,365 100%</b>	<b>2,385,936 100%</b>	<b>2,466,845 100%</b>	<b>5.8%</b>

Source: Statistical Yearbook 2001, Binh Dinh Province.

**Table B.9 Cropped Area, Unit Yield and Production of Paddy by Season**

(Whole Province)

	Total			Winter-Spring			Summer-Autumn			Winter		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
1995 Year	118,419	3.40	402,300	44,959	3.89	174,890	35,305	3.76	132,786	38,155	2.48	94,624
1996 Year	124,024	3.54	439,100	45,873	3.83	175,467	38,432	3.98	152,809	39,719	2.79	110,824
1997 Year	122,002	3.67	447,462	45,842	4.47	205,069	38,151	3.83	146,241	38,009	2.53	96,153
1998 Year	120,346	3.61	434,241	45,773	4.10	187,775	35,639	3.64	129,774	38,934	3.00	116,692
1999 Year	126,137	4.00	504,670	46,146	4.65	214,636	39,954	4.19	167,378	40,037	3.06	122,656
2000 Year	126,873	4.12	522,977	46,523	4.68	217,519	40,888	4.26	174,165	39,462	3.33	131,293
2001 Year	128,768	4.24	546,588	47,310	4.81	227,692	40,988	4.31	176,648	40,470	3.51	142,248
Average 1999 -2001, 3 years	127,300	4.12	524,900	46,700	4.71	220,100	40,600	4.25	172,700	40,000	3.30	132,100

Source: Statistical Yearbook 2001, Binh Dinh Province

(by District)

District or City	duration	Total			Winter-Spring			Summer-Autumn			Winter		
		Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
Quy Nhon	1999-2001	2,740	4.08	11,170	1,130	4.39	4,960	1,070	4.06	4,340	540	3.44	1,860
An Lao	2001	2,550	3.34	8,510	1,160	3.29	3,820	920	3.45	3,170	470	3.23	1,520
Hoai An	2001	12,410	4.12	51,100	4,660	4.10	19,110	4,020	4.39	17,630	3,740	3.83	14,320
Hoai Nhon	2001	15,320	4.09	62,620	5,410	4.43	23,960	4,920	4.06	19,960	4,990	3.75	18,700
Phu My	2001	18,180	3.93	71,440	6,440	4.33	27,900	5,020	4.47	22,420	6,720	3.14	21,120
Phu Cat	1999-2001	19,030	3.88	73,890	7,450	4.41	32,880	5,590	4.32	24,160	5,990	2.81	16,850
Vinh Thanh	2000-2001	1,880	3.57	6,720	630	4.19	2,640	490	3.96	1,940	750	2.85	2,140
Tay Son	1999-2001	13,390	4.29	57,490	4,570	4.86	22,210	3,890	4.49	17,470	4,930	3.61	17,820
An Nhon	1999-2001	20,980	4.49	94,110	7,340	5.26	38,600	7,090	4.33	30,690	6,540	3.80	24,820
Tuy Phuoc	1999-2001	19,750	4.74	93,630	7,640	5.74	43,840	7,560	4.21	31,800	4,550	3.95	17,990
Van Canh	1999-2001	1,840	2.16	3,980	540	3.19	1,720	260	3.00	780	1,040	1.42	1,480
Total/ Average		128,100	4.17	534,700	47,000	4.71	221,600	40,800	4.27	174,400	40,300	3.44	138,600

Source: Statistical Yearbook 2001, Binh Dinh Province and Districts.

**Table B.10 Cropped Area, Unit Yield and Production of Other Annual Crops (1/2)**

Production by Year

Year	Other Food Crops									Vegetable & Others					
	Maize			Cassava			Sweet Potatoes			Others			Vegetables		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
1995 Year	1,123	3.12	3,500	10,592	5.69	60,229	1,250	4.61	5,759	1,133	-	-	4,019	9.19	36,954
1996 Year	1,237	3.20	3,960	10,530	5.96	62,808	1,476	4.57	6,742	953	-	-	4,229	12.00	50,748
1997 Year	1,651	3.74	6,176	10,756	7.56	81,345	1,345	4.55	6,121	902	-	-	5,053	11.08	56,006
1998 Year	1,302	3.08	4,016	10,916	8.84	96,459	1,252	4.71	5,893	938	-	-	6,984	10.63	74,217
1999 Year	1,857	3.43	6,372	10,520	9.54	100,381	1,135	4.68	5,309	812	-	-	7,872	10.16	79,997
2000 Year	2,840	3.34	9,479	10,076	9.75	98,270	1,185	4.79	5,679	452	-	-	8,975	10.17	91,261
2001 Year	3,702	3.59	13,294	10,146	10.19	103,387	855	4.83	4,129	413	-	-	9,405	10.20	95,939
Average 1999 to 2001	2,800	3.46	9,700	10,200	9.87	100,700	1,100	4.55	5,000	600	-	-	8,800	10.13	89,100

2001 Year by District, City

City/District	Other Food Crops									Vegetable & Others					
	Maize			Cassava			Sweet Potatoes			Others			Vegetables		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
Quy Nhon	-	-	-	110	7.16	788	42	4.50	189	27	-	-	897	12.81	11,487
An Lao	209	2.97	621	240	9.83	2,358	45	3.84	173	-	-	-	83	7.64	634
Hoai An	518	3.99	2,067	810	9.71	7,869	156	4.50	702	-	-	-	633	7.64	4,836
Hoai Nhon	279	3.72	1,037	2,027	10.66	21,612	143	4.60	658	115	-	-	532	10.32	5,492
Phu My	386	4.08	1,573	1,756	10.65	18,701	150	4.00	600	216	-	-	2,622	11.12	29,157
Phu Cat	514	3.53	1,812	2,215	10.99	24,340	230	6.00	1,380	-	-	-	607	10.08	6,120
Vinh Thanh	199	2.21	439	400	10.05	4,020	28	5.07	142	19	-	-	116	8.64	1,002
Tay Son	467	4.16	1,941	1,250	10.68	13,348	15	3.67	55	28	-	-	1,301	8.80	11,453
An Nhon	685	3.83	2,625	20	4.10	82	-	-	-	-	-	-	859	10.88	9,345
Tuy Phuoc	319	3.44	1,096	270	8.76	2,365	-	-	-	8	-	-	1,544	9.67	14,936
Van Canh	126	0.66	83	1,048	7.54	7,904	46	5.00	230	-	-	-	211	7.00	1,477
Total	3,702	3.59	13,294	10,146	10.19	103,387	855	4.83	4,129	413	0.00	0	9,405	10.20	95,939

**Table B.10 Cropped Area, Unit Yield and Production of Other Annual Crops (2/2)**

Production by Year

Year	Industrial Crops														
	Groundnuts			Soyabeans			Sesame			Sugarcane			Tobacco		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
1995 Year	8,683	1.08	9,396	1,270	1.15	1,458	737	0.29	215	5,374	33.48	179,904	305	1.51	460
1996 Year	7,113	1.10	7,815	1,035	1.27	1,314	844	0.41	345	6,420	35.25	226,279	232	1.44	334
1997 Year	7,656	1.23	9,418	1,146	1.45	1,658	769	0.42	320	6,655	38.91	258,921	265	1.26	334
1998 Year	9,860	1.44	14,207	2,854	1.71	4,870	808	0.43	345	7,507	39.23	294,472	338	1.28	434
1999 Year	8,348	1.48	12,371	2,156	1.27	2,731	860	0.43	367	8,342	42.70	356,214	247	1.45	357
2000 Year	8,328	1.48	12,343	1,582	1.40	2,209	1,114	0.32	356	10,023	45.33	454,329	127	1.51	192
2001 Year	8,083	1.54	12,415	1,983	1.59	3,150	1,151	0.36	411	6,592	42.78	282,010	200	1.71	342
Average 1999 to 2001	8,300	1.49	12,400	1,900	1.42	2,700	1,000	0.40	400	8,300	43.88	364,200	200	1.50	300

2001 Year by District, City

City/District	Industrial Crops														
	Peanuts			Soyabeans			Sesame			Sugarcane			Tobacco		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
Quy Nhon	107	1.51	162	-	-	-	-	-	-	107	34.07	3,646	-	-	-
An Lao	245	1.00	244	55	0.84	46	29	0.31	9	8	35.00	280	-	-	-
Hoai An	473	0.96	455	132	0.82	108	2	0.50	1	82	41.68	3,418	-	-	-
Hoai Nhon	440	1.34	589	1	1.00	1	-	-	-	289	47.19	13,639	12	2.00	24
Phu My	2,478	1.65	4,083	7	1.57	11	714	0.40	285	932	38.10	35,509	17	1.59	27
Phu Cat	1,612	1.65	2,663	17	1.41	24	280	0.20	56	873	40.92	35,721	51	1.80	92
Vinh Thanh	406	1.27	514	65	1.28	83	-	-	-	546	47.80	26,099	15	0.87	13
Tay Son	714	1.69	1,206	247	1.80	445	17	0.59	10	2,091	45.00	94,095	103	1.80	185
An Nhon	688	1.81	1,246	1,099	1.79	1,969	46	0.41	19	269	49.70	13,369	-	-	-
Tuy Phuoc	578	1.60	927	360	1.29	463	43	0.58	25	78	38.00	2,964	-	-	-
Van Canh	342	0.95	326	-	-	-	20	0.30	6	1,317	40.45	53,270	2	0.50	1
Total	8,083	1.54	12,415	1,983	1.59	3,150	1,151	0.36	411	6,592	42.78	282,010	200	1.71	342

**Table B.11 Cropped Area, Unit Yield and Production of Perennial Crops**

Production by Year

Year	Tea			Pepper			Coffee			Cashew			Coconut		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
1995 Year	223.2	1.16	259.4	57.6	0.42	24.0	365.6	0.48	173.8	5,657	0.12	671.6	13,184	3.32	43,723
1996 Year	241.5	1.28	309.9	60.3	0.53	31.8	506.0	0.36	181.6	7,855	0.08	621.1	13,205	3.80	50,240
1997 Year	241.5	1.35	327.2	60.3	0.53	31.8	549.6	0.34	186.8	8,529	0.08	687.0	13,240	4.61	61,016
1998 Year	241.6	1.91	461.6	78.9	0.32	25.5	530.6	0.35	186.8	8,984	0.09	807.9	13,256	4.77	63,205
1999 Year	241.6	2.17	525.0	107.1	0.29	30.7	605.6	0.40	239.8	10,553	0.08	891.7	13,033	4.95	64,567
2000 Year	132.6	2.21	293.0	161.5	0.21	34.3	570.6	0.50	285.3	11,018	0.09	1,043.9	13,033	5.26	68,540
2001 Year	132.2	2.22	293.5	188.2	0.21	38.9	570.6	0.45	257.3	12,547	0.10	1,317.0	13,035	5.28	68,762
Average 1998 to 2001	187.0	2.10	393.3	133.9	0.24	32.4	569.4	0.43	242.3	10,776	0.09	1,015	13,089	5.06	66,269

2001 Year by District, City

City/District	Tea			Pepper			Coffee			Cashew			Coconut		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
Quy Nhon	-	-	-	4.0	0.10	0.4	-	-	-	108	0.27	29	188	4.91	924
An Lao	8.0	1.63	13.0	22.5	0.09	2.0	2.0	0.25	0.5	702	0.05	36	336	5.68	1,910
Hoai An	46.0	2.00	92.0	142.0	0.23	32.5	3.6	0.50	1.8	2,080	0.06	135	1,890	6.39	12,076
Hoai Nhon	2.5	1.80	4.5	2.5	0.40	1.0	-	-	-	1,100	0.19	210	4,425	5.38	23,817
Phu My	1.2	1.42	1.7	7.2	0.25	1.8	-	-	-	2,116	0.07	153	3,097	4.05	12,540
Phu Cat	73.0	0.03	2.0	-	-	-	-	-	-	2,426	0.08	183	1,779	6.14	10,925
Vinh Thanh	-	-	180.3	9.0	0.13	1.2	565.0	0.45	255.0	1,150	0.15	176	130	7.15	930
Tay Son	-	-	-	-	-	-	-	-	-	1,248	0.13	156	344	4.94	1,700
An Nhon	-	-	-	-	-	-	-	-	-	400	0.15	60	316	3.99	1,260
Tuy Phuoc	-	-	-	-	-	-	-	-	-	352	0.19	66	310	3.80	1,179
Van Canh	-	-	-	1.0	-	-	-	-	-	865	0.13	113	220	6.82	1,501
Total	130.7	2.25	293.5	188.2	0.21	38.9	570.6	0.45	257.3	12,547	0.10	1,317	13,035	5.28	68,762

Production by Year

Year	Orange			Pineapple			Banana			Mango			Others		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
1995 Year	186.0	2.57	478.0	506.2	2.98	1,509.0	1,134.0	2.75	3,122.3	369.4	2.21	816.0	971.2	0.00	-
1996 Year	194.2	2.61	507.4	447.8	3.57	1,598.6	1,285.2	3.03	3,888.0	507.7	1.61	817.0	590.5	0.00	-
1997 Year	194.7	3.24	630.9	487.3	3.56	1,733.0	1,402.0	3.70	5,184.6	571.8	1.80	1,029.0	789.5	0.00	-
1998 Year	208.7	3.27	683.4	515.8	3.80	1,959.2	1,429.0	4.00	5,715.0	869.0	1.32	1,147.2	718.2	0.00	-
1999 Year	207.5	3.43	711.5	534.8	3.78	2,022.2	1,443.0	4.21	6,074.0	971.0	1.42	1,378.7	703.3	0.00	-
2000 Year	211.0	3.46	730.0	499.8	4.09	2,045.4	1,447.0	4.29	6,205.0	1,019.9	1.43	1,456.3	753.8	0.00	-
2001 Year	241.4	3.42	826.0	432.8	3.93	1,700.4	1,459.0	4.30	6,269.0	1,039.7	1.68	1,748.1	893.3	0.00	-
Average 1998 to 2001	217.2	3.40	737.7	495.8	3.90	1,931.8	1,444.5	4.20	6,065.8	974.9	1.47	1,432.6	767.2	-	-

2001 Year by District, City

City/District	Orange			Pineapple			Banana			Mango			Others		
	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton	Area ha	Yield ton/ha	Prod. ton
Quy Nhon	2.8	2.61	7.3	9.0	4.20	37.8	68.0	3.53	240.0	38.4	3.20	123.0	141.5	0.00	-
An Lao	24.0	3.50	84.0	95.0	3.94	374.0	155.0	3.93	609.0	141.9	1.48	210.0	184.8	0.00	-
Hoai An	33.8	3.76	127.0	160.0	3.47	555.0	465.0	4.24	1,970.0	76.0	1.79	136.0	326.0	0.00	-
Hoai Nhon	100.0	4.50	450.0	35.0	4.60	161.0	182.0	4.75	864.0	50.0	2.40	120.0	33.0	0.00	-
Phu My	3.0	3.00	9.0	4.8	5.00	24.0	30.0	4.97	149.0	56.0	2.86	160.0	37.5	0.00	-
Phu Cat	1.2	4.00	4.8	13.0	5.00	65.0	15.0	4.47	67.0	224.0	0.31	70.4	3.0	0.00	-
Vinh Thanh	19.6	2.22	43.5	64.0	4.59	294.0	120.0	4.46	535.0	129.8	0.59	76.7	17.5	0.00	-
Tay Son	9.0	2.53	22.8	8.0	3.33	26.6	100.0	4.70	470.0	83.0	2.17	180.0	54.0	0.00	-
An Nhon	6.0	1.60	9.6	1.0	4.00	4.0	104.0	4.50	468.0	55.6	2.70	150.0	13.0	0.00	-
Tuy Phuoc	32.0	1.25	40.0	28.0	3.54	99.0	133.0	4.62	615.0	155.0	2.94	456.0	34.0	0.00	-
Van Canh	10.0	2.80	28.0	15.0	4.00	60.0	87.0	3.24	282.0	30.0	2.20	66.0	49.0	0.00	-
Total	241.4	3.42	826.0	432.8	3.93	1,700.4	1,459.0	4.30	6,269.0	1,039.7	1.68	1,748.1	893.3	-	-



**Table B.12 Paddy Production in the Kone River Basin (Average in 1999 to 2001) (1/2)**

District/ City	Ward/ Subtown/ Commune	Average of 3 Years (1999 to 2001)											
		Total			Winter-Spring			Sum-Aut			Third crop		
		Area ha	Prod. ton	Yield ton/ha	Area ha	Prod. ton	Yield ton/ha	Area ha	Prod. ton	Yield ton/ha	Area ha	Prod. ton	Yield ton/ha
1 Qui Nhon		2,747	11,180	4.07	1,132	4,964	4.39	1,068	4,342	4.07	547	1,874	3.42
2 An Lao		39	112	2.85	0	0	-	37	107	2.88	2	5	2.33
3 Hoai Nhon		-	-	-	-	-	-	-	-	-	-	-	-
4 Hoai An		-	-	-	-	-	-	-	-	-	-	-	-
5 Phu My		7,880	31,900	4.05	2,776	12,039	4.34	2,193	9,948	4.54	2,911	9,913	3.40
6 Vinh Thanh		1,878	6,496	3.46	634	2,418	3.81	494	1,935	3.91	750	2,143	2.86
7 Phu Cat		16,315	63,378	3.88	6,313	27,978	4.43	4,678	20,377	4.36	5,324	15,023	2.82
8 Tay Son		13,387	57,487	4.29	4,573	22,202	4.86	3,887	17,436	4.49	4,927	17,848	3.62
9 An Nhon		20,983	94,103	4.48	7,344	38,597	5.26	7,094	30,688	4.33	6,545	24,818	3.79
10 Tuy Phuoc		19,745	92,725	4.70	7,637	43,844	5.74	7,560	31,804	4.21	4,548	17,077	3.75
11 Van Canh		1,835	3,983	2.17	538	1,716	3.19	261	783	3.00	1,036	1,485	1.43
Total of Data		84,810	361,364	4.26	30,946	153,758	4.97	27,274	117,421	4.31	26,591	90,186	3.39
Whole Province		127,259	524,745	4.12	46,660	219,949	4.71	40,610	172,730	4.25	39,990	132,066	3.30
1 Qui Nhon	Tran Quang Dieu	301	1,130	3.75	127	507	3.99	101	382	3.79	73	241	3.29
2 Qui Nhon	Bui Thi Xuan	332	1,207	3.64	114	444	3.90	143	523	3.67	76	240	3.18
3 Qui Nhon	Dong Da	0	0	-	-	-	-	-	-	-	-	-	-
4 Qui Nhon	Thi Nai	0	0	-	-	-	-	-	-	-	-	-	-
5 Qui Nhon	Quang Trung	34	111	3.29	20	74	3.67	13	36	2.73	-	-	-
6 Qui Nhon	Ghenh Rang	53	161	3.02	30	102	3.36	10	32	3.10	13	27	2.12
7 Qui Nhon	Ngo May	0	0	-	-	-	-	-	-	-	-	-	-
8 Qui Nhon	Nguyen Van Cu	0	0	-	-	-	-	-	-	-	-	-	-
9 Qui Nhon	Tran Hung Dao	0	0	-	-	-	-	-	-	-	-	-	-
10 Qui Nhon	Le Hong Phong	0	0	-	-	-	-	-	-	-	-	-	-
11 Qui Nhon	Ly Thuong Kiet	0	0	-	-	-	-	-	-	-	-	-	-
12 Qui Nhon	Tran Phu	0	0	-	-	-	-	-	-	-	-	-	-
13 Qui Nhon	Le Loi	0	0	-	-	-	-	-	-	-	-	-	-
14 Qui Nhon	Hai Cang	0	0	-	-	-	-	-	-	-	-	-	-
15 Qui Nhon	Nhon Binh	1,013	4,540	4.48	473	2,234	4.72	449	1,965	4.38	91	340	3.74
16 Qui Nhon	Nhon Phu	879	3,640	4.14	315	1,438	4.57	298	1,245	4.17	265	957	3.61
17 Qui Nhon	Nhon Ly	0	0	-	-	-	-	-	-	-	-	-	-
18 Qui Nhon	Nhon Hai	0	0	-	-	-	-	-	-	-	-	-	-
19 Qui Nhon	Nhon Hoi	135	392	2.90	53	165	3.14	53	159	2.98	29	68	2.32
Total of Qui Nhon City		2,747	11,180	4.07	1,132	4,964	4.39	1,068	4,342	4.07	547	1,874	3.42
5 An Lao	An Toan	39	112	2.85	-	-	-	37	107	2.88	2	5	2.33
Total of An Lao District		39	112	2.85	0	0	-	37	107	2.88	2	5	2.33
1 Phu My	Phu My	843	3,469	4.11	272	1,197	4.41	270	1,230	4.55	301	1,041	3.46
14 Phu My	My Chanh	1,404	5,389	3.84	588	2,462	4.19	315	1,395	4.43	502	1,531	3.05
16 Phu My	My Quang	886	3,573	4.03	273	1,184	4.33	241	1,088	4.52	372	1,301	3.50
17 Phu My	My Hiep	2,712	11,235	4.14	943	4,169	4.42	805	3,665	4.55	964	3,402	3.53
18 Phu My	My Tai	1,199	4,431	3.69	421	1,722	4.09	285	1,173	4.12	493	1,537	3.11
19 Phu My	My Cat	835	3,804	4.56	278	1,306	4.70	279	1,398	5.02	278	1,101	3.95
Total of Phu My District		7,880	31,900	4.05	2,776	12,039	4.34	2,193	9,948	4.54	2,911	9,913	3.40
1 Vinh Thanh	Vinh Son	178	502	2.82	93	296	3.20	28	83	3.00	58	123	2.12
2 Vinh Thanh	Vinh Kim	21	60	2.83	8	25	3.00	10	28	2.94	3	7	2.09
3 Vinh Thanh	Vinh Hoa	26	70	2.70	10	29	2.90	8	23	3.00	9	19	2.19
4 Vinh Thanh	Vinh Hiep	306	1,097	3.58	95	366	3.85	95	394	4.15	116	337	2.90
5 Vinh Thanh	Vinh Hao	76	259	3.41	23	84	3.66	25	95	3.80	28	80	2.86
6 Vinh Thanh	Vinh Quang	434	1,325	3.06	117	425	3.65	81	305	3.76	236	596	2.52
7 Vinh Thanh	Vinh Thinh	838	3,182	3.80	289	1,193	4.14	249	1,008	4.05	300	982	3.27
Total of Vinh Thanh District		1,878	6,496	3.46	634	2,418	3.81	494	1,935	3.91	750	2,143	2.86
1 Phu Cat	Ngo May	317	681	2.14	103	270	2.63	35	87	2.51	180	323	1.80
2 Phu Cat	Cat Son	567	1,888	3.33	202	813	4.03	121	511	4.23	245	564	2.30
3 Phu Cat	Cat Minh	1,557	6,697	4.30	555	2,490	4.48	483	2,030	4.20	518	2,177	4.20
4 Phu Cat	Cat Tai	1,819	7,219	3.97	651	2,791	4.29	509	2,201	4.33	660	2,228	3.38
6 Phu Cat	Cat Lam	652	1,869	2.87	213	812	3.81	123	395	3.20	315	662	2.10
7 Phu Cat	Cat Hanh	2,298	9,268	4.03	777	3,510	4.52	654	2,815	4.30	866	2,943	3.40
10 Phu Cat	Cat Hiep	600	1,205	2.01	114	305	2.67	70	151	2.16	416	749	1.80
11 Phu Cat	Cat Trinh	1,250	3,750	3.00	453	1,676	3.70	150	555	3.71	648	1,519	2.34
12 Phu Cat	Cat Nhon	1,540	6,444	4.18	630	2,985	4.74	521	2,206	4.24	389	1,253	3.22
13 Phu Cat	Cat Hung	950	4,202	4.42	435	2,095	4.82	330	1,503	4.56	185	604	3.26
14 Phu Cat	Cat Tuong	1,511	5,559	3.68	683	2,982	4.37	433	1,792	4.14	394	784	1.99
15 Phu Cat	Cat Tan	1,190	3,850	3.24	476	1,827	3.83	257	943	3.68	457	1,080	2.36
16 Phu Cat	Cat Tien	891	4,550	5.11	460	2,454	5.33	430	2,093	4.86	1	3	4.00
17 Phu Cat	Cat Thang	1,173	6,198	5.29	560	2,967	5.30	563	3,095	5.50	50	136	2.71

**Table B.12 Paddy Production in the Kone River Basin (Average in 1999 to 2001) (2/2)**

District/ City	Ward/ Subtown/ Commune	Average of 3 Years (1999 to 2001)											
		Total			Winter-Spring			Sum-Aut			Third crop		
		Area	Prod.	Yield	Area	Prod.	Yield	Area	Prod.	Yield	Area	Prod.	Yield
<b>Total of Phu Cat District</b>		16,315	63,378	3.88	6,313	27,978	4.43	4,678	20,377	4.36	5,324	15,023	2.82
1 Tay Son	Phu Phong	663	2,477	3.73	309	930	3.00	172	780	4.53	182	767	4.21
2 Tay Son	Binh Tan	730	2,973	4.07	234	1,052	4.50	240	947	3.94	256	974	3.81
3 Tay Son	Tay Thuan	544	1,913	3.52	162	721	4.44	73	285	3.88	308	907	2.94
4 Tay Son	Binh Thuan	829	2,325	2.81	209	828	3.96	123	448	3.65	497	1,049	2.11
5 Tay Son	Tay Giang	675	2,610	3.87	264	1,226	4.65	136	586	4.32	275	799	2.90
6 Tay Son	Binh Thanh	1,184	5,326	4.50	387	1,847	4.77	395	1,841	4.66	402	1,638	4.08
7 Tay Son	Tay An	1,111	5,170	4.66	426	2,136	5.02	337	1,558	4.63	348	1,477	4.24
8 Tay Son	Binh Hoa	1,472	7,383	5.02	491	2,709	5.52	491	2,435	4.96	491	2,239	4.56
9 Tay Son	Binh Tuong	1,067	4,041	3.79	389	1,791	4.60	227	982	4.33	451	1,268	2.81
10 Tay Son	Tay Vinh	1,056	4,781	4.53	345	1,785	5.17	344	1,601	4.66	367	1,395	3.80
11 Tay Son	Tay Binh	840	3,680	4.38	284	1,412	4.97	260	1,192	4.59	296	1,076	3.63
12 Tay Son	Vinh An	64	175	2.73	31	96	3.11	16	45	2.90	18	35	1.94
13 Tay Son	Tay Xuan	683	3,178	4.65	215	1,144	5.32	239	1,073	4.50	229	961	4.19
14 Tay Son	Tay Phu	957	4,218	4.41	348	1,634	4.70	299	1,335	4.46	310	1,249	4.03
15 Tay Son	Binh Nghi	1,512	7,236	4.78	478	2,892	6.05	538	2,330	4.33	497	2,015	4.06
<b>Total of Tay Son District</b>		13,387	57,487	4.29	4,573	22,202	4.86	3,887	17,436	4.49	4,927	17,848	3.62
1 An Nhon	Binh Dinh	807	4,126	5.11	278	1,706	6.13	269	1,321	4.90	259	1,099	4.24
2 An Nhon	Dap Da	455	2,738	6.02	227	1,473	6.48	222	1,243	5.60	6	23	4.10
3 An Nhon	Nhon Thanh	1,157	5,128	4.43	442	2,228	5.04	422	1,802	4.27	293	1,098	3.75
4 An Nhon	Nhon My	1,919	8,677	4.52	667	3,525	5.28	591	2,554	4.32	661	2,598	3.93
5 An Nhon	Nhon Hanh	2,224	10,507	4.72	795	4,644	5.84	772	3,289	4.26	657	2,574	3.92
6 An Nhon	Nhon Phong	1,275	6,311	4.95	514	2,904	5.65	457	2,098	4.59	303	1,309	4.32
7 An Nhon	Nhon Hau	1,068	4,729	4.43	370	1,981	5.35	347	1,513	4.36	351	1,235	3.52
8 An Nhon	Nhon An	1,591	7,601	4.78	550	3,140	5.71	508	2,291	4.51	533	2,170	4.07
9 An Nhon	Nhon Hung	1,189	5,298	4.46	400	2,180	5.46	391	1,664	4.26	398	1,454	3.65
10 An Nhon	Nhon Phuc	1,420	6,518	4.59	475	2,522	5.31	472	2,102	4.46	473	1,894	4.00
11 An Nhon	Nhon Khanh	1,128	5,138	4.55	377	2,055	5.46	370	1,568	4.24	382	1,514	3.97
12 An Nhon	Nhon Loc	1,798	7,299	4.06	602	2,731	4.54	602	2,431	4.04	594	2,137	3.60
13 An Nhon	Nhon Hoa	2,103	9,317	4.43	716	3,646	5.10	698	3,064	4.39	690	2,607	3.78
14 An Nhon	Nhon Tho	1,740	7,378	4.24	550	2,553	4.64	606	2,625	4.33	583	2,200	3.77
15 An Nhon	Nhon Tan	1,111	3,338	3.00	381	1,309	3.44	368	1,124	3.06	363	906	2.50
<b>Total of An Nhon District</b>		20,983	94,103	4.48	7,344	38,597	5.26	7,094	30,688	4.33	6,545	24,818	3.79
1 Tuy Phuoc	Tuy Phuoc	891	3,970	4.46	309	1,708	5.53	326	1,291	3.97	257	971	3.78
2 Tuy Phuoc	Dieu Tri	595	2,776	4.67	219	1,248	5.70	219	920	4.20	157	608	3.88
3 Tuy Phuoc	Phuoc Thang	1,824	9,390	5.15	850	5,186	6.10	826	3,657	4.43	148	546	3.68
4 Tuy Phuoc	Phuoc Hung	2,010	9,732	4.84	677	4,127	6.10	675	3,058	4.53	658	2,547	3.87
5 Tuy Phuoc	Phuoc Hoa	1,110	5,394	4.86	525	3,046	5.80	527	2,143	4.07	57	205	3.58
6 Tuy Phuoc	Phuoc Quang	1,831	8,843	4.83	664	3,940	5.93	665	2,925	4.40	502	1,978	3.94
7 Tuy Phuoc	Phuoc Son	2,883	14,580	5.06	1,179	7,312	6.20	1,227	5,481	4.47	477	1,787	3.75
8 Tuy Phuoc	Phuoc Hiep	1,997	9,259	4.64	699	4,055	5.80	678	2,847	4.20	620	2,357	3.80
9 Tuy Phuoc	Phuoc Loc	1,501	6,800	4.53	499	2,810	5.63	502	2,059	4.10	499	1,931	3.87
10 Tuy Phuoc	Phuoc Thuan	1,440	6,718	4.67	587	3,424	5.83	586	2,384	4.07	267	910	3.41
11 Tuy Phuoc	Phuoc Nghia	725	3,395	4.68	281	1,620	5.77	280	1,149	4.10	164	626	3.82
12 Tuy Phuoc	Phuoc An	1,850	7,938	4.29	715	3,573	5.00	686	2,656	3.87	449	1,709	3.80
13 Tuy Phuoc	Phuoc Thanh	715	2,591	3.62	268	1,134	4.23	224	771	3.43	223	687	3.08
14 Tuy Phuoc	Phuoc My	374	1,337	3.57	165	660	4.00	140	461	3.30	70	217	3.11
<b>Total of Tuy Phuoc District</b>		19,745	92,725	4.70	7,637	43,844	5.74	7,560	31,804	4.21	4,548	17,077	3.75
1 Van Canh	Van Canh	0	0	-	-	-	-	-	-	-	-	-	-
2 Van Canh	Canh Hiep	171	364	2.13	41	134	3.28	28	77	2.77	102	153	1.50
3 Van Canh	Canh Lien	277	664	2.40	171	466	2.72	79	163	2.07	27	35	1.30
4 Van Canh	Canh Vinh	706	1,854	2.63	235	830	3.53	115	427	3.72	356	596	1.67
5 Van Canh	Canh Hien	122	304	2.48	45	156	3.47	24	77	3.19	53	71	1.33
6 Van Canh	Canh Thuan	385	574	1.49	26	85	3.26	13	37	2.83	346	452	1.31
7 Van Canh	Canh Hoa	175	224	1.28	20	45	2.23	3	2	0.63	152	178	1.17
<b>Total of Van Canh District</b>		1,835	3,983	2.17	538	1,716	3.19	261	783	3.00	1,036	1,485	1.43

Source: Data Set of Binh Dinh Land Use General Inventory in 2000, Land Office of Binh Dinh Province.

**Table B.13 Livestock in the Province**

**(1) Buffalo**

(unit: head)

City/District	1995		1999		2000		2001		Average '99 - '01	
	Total	Plough	Total	Plough	Total	Plough	Total	Plough	Total	Plough
Quy Nhon	250	110	230	105	220	103	158	76	200	90
An Lao	995	483	1,333	662	1,293	631	1,944	948	1,520	750
Hoai An	2,954	1,592	2,899	1,681	2,410	1,350	1,984	879	2,430	1,300
Hoai Nhon	4,679	3,379	5,717	4,642	5,341	4,250	4,631	3,684	5,230	4,190
Phu My	2,884	1,916	2,909	1,541	3,083	1,633	4,710	2,494	3,570	1,890
Phu Cat	2,948	2,534	2,193	1,294	2,192	1,268	3,662	2,145	2,680	1,570
Vinh Thanh	628	138	846	318	844	312	712	263	800	300
Tay Son	312	330	420	154	373	136	689	251	490	180
An Nhon	1,246	952	1,702	1,403	1,565	1,158	1,251	946	1,510	1,170
Tuy Phuoc	1,498	1,098	1,157	926	1,186	930	902	707	1,080	850
Van Canh	86	0	78	26	80	26	76	25	80	30
Total	18,480	12,532	19,484	12,752	18,587	11,797	20,719	12,418	19,590	12,320
Growth rate	-	-	1.3%	0.4%	-4.6%	-7.5%	11.5%	5.3%	-	-
River Basin (Proportion)	9,850 53%	7,080 56%	9,540 49%	5,770 45%	9,540 51%	5,570 47%	12,160 59%	6,910 56%	10,410 53%	6,080 49%

**(2) Cattle**

(unit: head)

	1995		1999		2000		2001		2001	
	Total	Plough	Total	Plough	Total	Plough	Total	Plough	Total	Plough
Quy Nhon	5,910	1,962	6,691	2,006	6,155	1,741	5,404	1,528	6,100	1,800
An Lao	3,687	1,569	4,113	1,634	3,958	1,583	4,523	1,808	4,200	1,700
Hoai An	12,738	2,178	13,189	1,714	13,157	1,850	8,170	1,148	11,500	1,600
Hoai Nhon	19,603	3,018	20,333	3,798	20,374	3,798	17,559	3,173	19,400	3,600
Phu My	40,657	20,415	46,511	18,139	47,972	18,683	40,415	15,041	45,000	17,300
Phu Cat	41,530	22,500	42,762	22,664	44,900	23,097	37,052	18,729	41,600	21,500
Vinh Thanh	10,665	3,631	13,027	3,968	11,128	3,338	9,226	2,767	11,100	3,400
Tay Son	40,640	14,095	39,535	9,529	40,682	9,531	30,986	7,160	37,100	8,700
An Nhon	27,899	10,046	23,373	7,013	22,436	7,013	18,002	5,527	21,300	6,500
Tuy Phuoc	16,380	6,102	17,438	5,562	16,235	5,015	13,104	4,017	15,600	4,900
Van Canh	10,590	6,300	12,500	3,438	11,850	3,318	8,034	2,249	10,800	3,000
Total	230,299	91,816	239,472	79,465	238,847	78,967	192,475	63,147	223,700	74,000
Growth rate	-	-	1.0%	-3.5%	-0.3%	-0.6%	-19.4%	-20.0%	-	-
River Basin (Proportion)	194,300 84%	85,100 93%	201,800 84%	72,300 91%	201,400 84%	71,700 91%	162,200 84%	57,000 90%	188,600 84%	67,100 91%

**(3) Pig**

(unit: head)

	1995		1999		2000		2001		2001	
	Total	Pork	Total	Pork	Total	Pork	Total	Pork	Total	Pork
Quy Nhon	19,314	17,796	23,340	22,043	22,290	21,040	22,643	21,393	22,800	21,500
An Lao	9,284	8,177	13,711	11,429	14,259	11,658	9,983	8,147	12,700	10,400
Hoai An	35,678	30,512	42,209	36,871	44,657	38,498	61,964	52,163	49,600	42,500
Hoai Nhon	60,259	52,111	66,322	57,193	69,240	58,622	103,948	100,884	79,800	72,200
Phu My	44,696	35,390	49,404	38,150	49,997	38,612	61,175	47,276	53,500	41,300
Phu Cat	45,731	37,959	47,703	42,400	50,996	45,221	73,621	65,347	57,400	51,000
Vinh Thanh	9,261	8,580	12,880	12,063	15,963	14,950	12,619	11,032	13,800	12,700
Tay Son	36,654	31,782	45,219	37,569	48,022	39,790	61,802	56,526	51,700	44,600
An Nhon	36,340	27,557	42,066	28,749	45,589	31,473	75,557	58,580	54,400	39,600
Tuy Phuoc	35,667	28,196	40,130	28,495	41,086	29,378	56,821	40,590	46,000	32,800
Van Canh	7,070	6,649	10,105	9,430	9,040	8,384	5,018	4,643	8,100	7,500
Total	339,954	284,709	393,089	324,392	411,139	337,626	545,151	466,581	449,800	376,100
Growth rate	-	-	3.7%	3.3%	4.6%	4.1%	32.6%	38.2%	-	-
River Basin (Proportion)	234,700 69%	193,900 68%	270,800 69%	218,900 67%	283,000 69%	228,800 68%	369,300 68%	305,400 65%	307,700 68%	251,000 67%

Source: Statistical Yearbook 2001, Binh Dinh Province.

**Table B.14 Fishery Statistics in the Province**

**(1) Fishery Production**

		1995	1999	2000	2001
Marine Catch	Fish	53,502 ton	57,860 ton	61,300 ton	66,250 ton
	Shrimp	180 ton	562 ton	778 ton	788 ton
	Others	4,977 ton	10,416 ton	13,062 ton	14,576 ton
	Total	58,659 ton	68,838 ton	75,140 ton	81,614 ton
Fresh Water Catch	Fish	-	257 ton	241 ton	237 ton
	Shrimp	-	12 ton	12 ton	10 ton
	Others	-	9 ton	13 ton	176 ton
	Total	-	278 ton	266 ton	423 ton
Aquaculture	Fish	682 ton	881 ton	752 ton	746 ton
	Shrimp	481 ton	828 ton	1,559 ton	1,682 ton
	Others	0 ton	88 ton	108 ton	99 ton
	Total	1,163 ton	1,797 ton	2,419 ton	2,527 ton
Grand Total	Fish	54,184 ton	58,998 ton	62,293 ton	67,233 ton
	Shrimp	661 ton	1,402 ton	2,349 ton	2,480 ton
	Others	4,977 ton	10,513 ton	13,183 ton	14,851 ton
	Total	59,822 ton	70,913 ton	77,825 ton	84,564 ton

**(2) Aquaculture Activities**

		1995	1999	2000	2001
Aquaculture Area	Fish	1,049 ha	1,417 ha	1,193 ha	1,542 ha
	Shrimp	1,424 ha	2,002 ha	2,443 ha	2,609 ha
	Others	0 ha	16 ha	0 ha	10 ha
	Breeding race	0 ha	57 ha	59 ha	22 ha
	Sub-Total	2,473 ha	3,492 ha	3,695 ha	4,183 ha
Cageculture	Household	52	18	13	21
	Number of Cage	76	23	13	66
	Surface Area	342 sq. m	153 sq. m	98 sq. m	561 sq. m

**(3) Fishery Activities**

		1995	1999	2000	2001
Number of Labour (persons)		N.I	34,352	35,369	40,848
Fishing Gear (pieces)		N.I	6,104	6,450	7,204
Number of Boat	Quantity	N.I	4,934	5,163	5,742
	Capacity (CV)	N.I	146,478	190,503	220,220
Number of Non-Motor Boat		N.I	981	1,150	1,275

Note; N.I: No Information available

**(4) Aquatic Race Product**

		1995	1999	2000	2001
Race fish (million)		3.2 milli.	5.0 milli.	6.7 milli.	7.0 milli.
Breeder shrimp					
Small breeder shrimp		0.0 milli.	20.0 milli.	592.6 milli.	441.2 milli.
Breeder shrimp		30.9 milli.	130.5 milli.	533.5 milli.	325.0 milli.
Total		30.9 milli.	150.5 milli.	1,126.1 milli.	766.2 milli.

Source: Statistical Yearbook, Binh Dinh Province 2001.

**Table B.15 Fishery Production Indicators in the Province**

**(1) Aquaculture**

		Unit	1995	1999	2000	2001
<b>Fish</b>	Area	ha	1,049	1,417	1,193	1,542
	Production	ton	682	881	752	746
	Value	milli. VND	4,900	7,049	6,010	5,970
	Unit Yield	kg/ha	650	620	630	480
	Price	VND/kg	7,200	8,000	8,000	8,000
	Value per ha	milli. VND/ha	4.67	4.97	5.04	3.87
	<b>Shrimp</b>	Area	ha	1,424	2,002	2,443
Production		ton	481	828	1,559	1,682
Value		milli. VND	25,127	49,690	93,513	100,890
Unit Yield		kg/ha	340	410	640	640
Price		VND/kg	52,200	60,000	60,000	60,000
Value per ha		milli. VND/ha	17.65	24.82	38.28	38.67
<b>Others</b>		Area	ha	0	73	59
	Production	ton	0	88	108	99
	Value	milli. VND	327	922	1,142	1,039
	Unit Yield	kg/ha	-	1,210	1,830	3,090
	Price	VND/kg	-	10,500	10,600	10,500
	Value per ha	milli. VND/ha	-	12.63	19.36	32.47
	<b>Total</b>	Area	ha	2,473	3,492	3,695
Production		ton	1,163	1,797	2,419	2,527
Value		milli. VND	30,354	57,661	100,665	107,899
Unit Yield		kg/ha	470	510	650	600
Price		VND/kg	26,100	32,100	41,600	42,700
Value per ha		milli. VND/ha	12.27	16.51	27.24	25.79

Source: Estimation based on the Statistical Yearbook 2001, Binh Dinh Province.

**(2) Fish Catch**

		Unit	1995	1999	2000	2001
<b>Fish</b>	Production	ton	53,502	58,117	61,541	66,487
	Value	milli. VND	273,549	320,285	339,081	367,529
	Price	VND/kg	5,100	5,500	5,500	5,500
<b>Shrimp</b>	Production	ton	180	574	790	798
	Value	milli. VND	3,128	11,339	15,657	15,839
	Price	VND/kg	17,400	19,800	19,800	19,800
<b>Others</b>	Production	ton	4,977	10,425	13,075	14,752
	Value	milli. VND	74,867	153,793	183,994	198,497
	Price	VND/kg	15,000	14,800	14,100	13,500
<b>Total</b>	Production	ton	58,659	69,116	75,406	82,037
	Value	milli. VND	351,544	485,417	538,732	581,865
	Price	VND/kg	6,000	7,000	7,100	7,100

Source: Estimation based on the Statistical Yearbook 2001, Binh Dinh Province.

**Table B.16 Existing Irrigation Schemes In Review and Supplementary Report  
on Rural & Agricultural Development , Province (1/2)**

No.	Name of Irrigation Scheme		Name of River Basin	Constructed Irrigation Area by DARD (Net)	Actual Irrigation Area by DARD (Net)	Remark
<b>A North of La Tinh River basin</b>						
1	Cay Gay Left	W	La Tinh	1,162	1,162	CgaiL(56%)
2	Cay Ke Left	W	La Tinh	331	331	CkeL (41%)
3	Cay Ke Right North	W	La Tinh	121	121	CkeRN (15%)
4	<del>Diem Tieu</del>	R	La Tinh	300	260	DieT
5	Hoi Khanh	R	La Tinh	250	250	HoiK
6	Trinh Van	R	La Tinh	150	120	TriV
7	Chi Hoa	R	La Tinh	62	50	ChiH
8	Dap Cue	R	La Tinh	214	173	DapC
9	Hoa Nghia	R	La Tinh	64	52	HoaN
10	Ho Tranh	R	La Tinh	15	12	HoT
11	Nha Ho	R	La Tinh	6	5	NhaH
12	Choi Hien	R	La Tinh	47	38	ChoH
13	Hoc Man	R	La Tinh	81	66	HocM
14	My Khanh	R	La Tinh	17	14	MyK
15	Nui Giau	R	La Tinh	28	23	NuiG
16	Hoc Dau	R	La Tinh	26	21	HocD
17	Lac Son 1	R	La Tinh	43	35	LacS1
18	Lac Son 2	R	La Tinh	36	29	LacS2
19	Chanh Thuan	R	La Tinh	38	31	ChaT
20	Minor Schemes		La Tinh	1199	612	MSA
<b>Sub-total 1</b>				<b>4,190</b>	<b>3,405</b>	
<b>B South of La Tinh River Basin and North of Kone River Basin</b>						
1	Hoi Son Upstream	R	La Tinh	118	118	HSup
2	Cay Gai Right	W	La Tinh	913	913	CgaiR (44%)
3	Cay Ke Right South	W	La Tinh	355	355	CkeRS (44%)
4	Thuan Ninh	R	Kone	1,060	1,060	ThuN
5	My Thuan	R	Kone	350	350	MyT
6	Tuong Son	R	Kone	336	336	Tson
7	Suoi Chay	R	Kone	250	250	SuoC
8	Hon Ga	R	Kone	150	120	HonG
9	Thi Lua	P	Kone	206	226	ThiL
10	Dai Binh	P	Kone	40	40	DaiB
11	Ngai Chanh	P	Kone	62	55	NgaC
12	Chanh Nhon	R	Kone	60	60	CNh
13	Dai An	R	Kone	65	65	DaiA
14	Cua Khau	R	Kone	65	65	CuaK
15	Suoi Tre	R	La Tinh	150	140	SuoT
16	<del>Thach Ban</del>	R	La Tinh	40	28	ThaB
17	<del>Tam Son</del>	R	La Tinh	47	47	TamS
18	<del>D Lang</del>	R	La Tinh	44	30	Dlan
19	Chanh Hung	R	La Tinh	263	250	ChaH
20	<del>Cay Cam(Thich)</del>	R	La Tinh	84	80	CayT
21	<del>Cay Da</del>	R	La Tinh	84	80	CayD
22	<del>Tan Thang</del>	R	La Tinh	42	40	TanT
23	<del>Tan Thang 1</del>	R	La Tinh	15	13	TanT1
24	<del>Hoc Cho</del>	R	La Tinh	21	13	HocC
25	<del>Bo Se</del>	R	La Tinh	68	40	BoS
26	<del>Minor schemes not included</del>		La Tinh	241	77	MSBO
27	Minor Schemes			2,684	318	MSB
<b>Sub-total 2</b>				<b>7,813</b>	<b>5,169</b>	

Note: W: Weir, R: Reservoir, P: Pumping Station,

~~Diem Tieu~~ : Schemes crossed out with line are located outside of JICA Study Area.

**Table B.16 Existing Irrigation Schemes In Review and Supplementary Report  
on Rural & Agricultural Development , Province (2/2)**

No.	Name of Irrigation Scheme		Name of River Basin	Constructed Irrigation Area by DARD (Net)	Actual Irrigation Area by DARD (Net)	Remark
<b>C Tan An - Dap Da</b>						
1	Thanh Hoa	W	Kone	4,120	4,055	ThanH
2	Thach De	W	Kone	1,300	1,247	ThaD
3	Thuan Hat	W	Kone	187	166	ThuaH
4	Thap Mao	W	Kone	1,800	1,782	ThaM
5	Lao Tam	W	Kone	702	688	LaoT
6	Nha Phu	W	Kone	300	300	NhaP
7	Ha Bac	W	Kone	300	300	HaB
8	Bo Ngo	W	Kone	588	523	BoN
9	Bay Yen	P	Kone	247	220	BaY
10	Binh Thanh	P	Kone	170	170	BinT
11	Dap Cat	W	Kone	295	263	DapC
12	Van Kham	W	Kone	385	343	VanK
13	Van Moi	W	Kone	235	209	VanM
14	Nhon Phong (Ban Nui)	W	Kone	695	619	NhoP
15	Da Den	W	Kone	358	319	DaD
16	Ben Tranh	P	Kone	42	37	BenT
17	Thanh Danh	P	Kone	49	44	ThaD
18	Ben Go	P	Kone	0	0	BenG
19	Thach De	P	Kone	67	60	ThaD
20	An Loi	P	Kone	43	38	AnL
21	Trung Ly	P	Kone	15	13	TruL
22	An Hoa	P	Kone	34	30	AnH
23	An Thuan I+II	P	Kone	101	90	AnT
24	Long Quang	P	Kone	80	70	LonQ
25	Minor Schemes		Kone	1,907	827	MSC
<b>Sub-total 3</b>				<b>14,020</b>	<b>12,413</b>	
<b>D South of Kone River Basin</b>						
1	Loc (Kien) Giang	W	Kone	600	583	LocG
2	Nui Mot	R	Kone	2,920	2,920	NuiM
3	Thu Thien	R	Kone	150	120	ThuT
4	Lo Mon	R	Kone	74	50	LoM
5	Minor Schemes		Kone	2,956	857	MSD
<b>Sub-total 4</b>				<b>6,700</b>	<b>4,530</b>	
<b>E Downstream Reaches of Ha Thanh River Basin</b>						
1	Long My 2	R	Ha Thanh	110	110	LonM
2	Hoc (Cay) Thich	R	Ha Thanh	96	80	CayT
3	Hoc (Ho) Cay Da	R	Ha Thanh	96	80	CayD
4	Hoc (Cay) Ke	R	Ha Thanh	30	25	CayK
5	Minor Schemes		Ha Thanh	628	505	MSE
<b>Sub-total 5</b>				<b>960</b>	<b>800</b>	
<b>F Van Canh Region</b>						
1	Ba thien	R	Ha Thanh	62	50	BaTh
2	Suoi Nhien	R	Ha Thanh	40	40	SuoT
3	Minor Schemes		Ha Thanh	367	290	MSF
<b>Sub-total 6</b>				<b>469</b>	<b>380</b>	
<b>G Vinh Thanh Region</b>						
1	Hon Lap	R	Kone	250	210	HonL
2	Minor Schemes		Kone	345	155	MSG
<b>Sub-total 7</b>				<b>595</b>	<b>365</b>	
<b>Total (1~7)</b>				<b>34,747</b>	<b>27,062</b>	

Note: W: Weir, R: Reservoir, P: Pumping Station,

**Table B.17 Existing Irrigation Schemes in JICA Study Area (1/2)**

No.	Name of Irrigation Scheme		Name of River Basin	Constructed Irrigation Area by DARD (Net)	Actual Irrigation Area by DARD (Net)	Remark
<b>A North of La Tinh River basin</b>						
1	Cay Gay Left	W	La Tinh	1,162	1,162	CgaiL(56%)
2	Cay Ke Left	W	La Tinh	331	331	CkeL(41%)
3	Cay Ke Right North	W	La Tinh	121	121	CkeRN(15%)
<b>Sub-total 1</b>				<b>1,614</b>	<b>1,614</b>	
<b>B South of La Tinh River Basin and North of Kone River Basin</b>						
1	Hoi Son Upstream	R	La Tinh	118	118	HSup
2	Cay Gai Right	W	La Tinh	913	913	CgaiR(44%)
3	Cay Ke Right South	W	La Tinh	355	355	CkeRS(44%)
4	Thuan Ninh	R	Kone	1,060	1,060	ThuN
5	My Thuan	R	Kone	350	350	MyT
6	Tuong Son	R	Kone	336	336	Tson
7	Suoi Chay	R	Kone	250	250	SuoC
8	Hon Ga	R	Kone	150	120	HonG
9	Chanh Nhon	R	Kone	60	60	CNh
10	Dai An	R	Kone	65	65	DaiA
11	Cua Khau	R	Kone	65	65	CuaK
12	Dai Binh	P	Kone	45	40	DaiB
13	Thi Lua	P	Kone	226	206	ThiL
14	Ngai Chanh	P	Kone	60	53	NgaC
15	Minor Schemes			2,661	340	MSB
<b>Sub-total 2</b>				<b>6,714</b>	<b>4,331</b>	
<b>C Tan An - Dap Da</b>						
1	Thanh Hoa	W	Kone	4,120	4,055	ThanH
2	Thach De	W	Kone	1,300	1,247	ThaD
3	Thuan Hat	W	Kone	187	166	ThuaH
4	Thap Mao	W	Kone	1,800	1,782	ThaM
5	Lao Tam	W	Kone	702	688	LaoT
6	Nha Phu	W	Kone	300	300	NhaP
7	Ha Bac	W	Kone	300	300	HaB
8	Bo Ngo	W	Kone	588	523	BoN
9	Bay Yen	P	Kone	247	220	BaY
10	Binh Thanh	P	Kone	170	170	BinT
11	Dap Cat	W	Kone	295	263	DapC
12	Van Kham	W	Kone	385	343	VanK
13	Van Moi	W	Kone	235	209	VanM
14	Nhon Phong (Ban Nui)	W	Kone	695	619	NhoP
15	Da Den	W	Kone	358	319	DaD
16	Ben Tranh	P	Kone	42	37	BenT
17	Thanh Danh	P	Kone	49	44	ThaD
18	Ben Go	P	Kone	0	0	BenG
19	Thach De	P	Kone	67	60	ThaD
20	An Loi	P	Kone	43	38	AnL
21	Trung Ly	P	Kone	15	13	TruL
22	An Hoa	P	Kone	34	30	AnH
23	An Thuan I+II	2P	Kone	101	90	AnT
24	Long Quang	P	Kone	80	70	LonQ
25	Minor Schemes		Kone	1,907	827	MSC
<b>Sub-total 3</b>				<b>14,020</b>	<b>12,413</b>	

Note: W: Weir, R: Reservoir, P: Pumping Station.



**Table B.17 Existing Irrigation Schemes in JICA Study Area (2/2)**

No.	Name of Irrigation Scheme		Name of River Basin	Constructed Irrigation Area by DARD (Net)	Actual Irrigation Area by DARD (Net)	Remark
<b>D South of Kone River Basin</b>						
1	Loc (Kien) Giang	W	Kone	600	583	LocG
2	Nui Mot	R	Kone	2,920	2,920	NuiM
3	Thu Thien	R	Kone	150	120	ThuT
4	Lo Mon	R	Kone	74	50	LoM
5	Minor Schemes		Kone	2,956	857	MSD
<b>Sub-total 4</b>				<b>6,700</b>	<b>4,530</b>	
<b>E Downstream Reaches of Ha Thanh River Basin</b>						
1	Long My 2	R	Ha Thanh	110	110	LonM
2	Hoc (Cay) Thich	R	Ha Thanh	96	80	CayT
3	Hoc (Ho) Cay Da	R	Ha Thanh	96	80	CayD
4	Hoc (Cay) Ke	R	Ha Thanh	30	25	CayK
5	Minor Schemes		Ha Thanh	628	505	MSE
<b>Sub-total 5</b>				<b>960</b>	<b>800</b>	
<b>F Van Canh Region</b>						
1	Ba thien	R	Ha Thanh	62	50	BaTh
2	Suoi Nhien	R	Ha Thanh	40	40	SuoT
3	Minor Schemes		Ha Thanh	367	290	MSF
<b>Sub-total 6</b>				<b>469</b>	<b>380</b>	
<b>G Vinh Thanh Region</b>						
1	Hon Lap	R	Kone	250	210	HonL
2	Minor Schemes		Kone	345	155	MSG
<b>Sub-total 7</b>				<b>595</b>	<b>365</b>	
<b>Total (1~7)</b>				<b>31,072</b>	<b>24,433</b>	

Note: W: Weir, R: Reservoir, P: Pumping Station.

**Table B.18 Major Irrigation Facilities in JICA Study Area**

No.	Irrigation Scheme	River Basin	Type of Works			Code
			(Reservoir)	(Weir)	(Pumping St.)	
<b>A</b>	<b>North of La Tinh River basin</b>		<b>0</b>	<b>2</b>	<b>0</b>	
1	Cay Gai	La Tinh		W		CgaiL
2	Cay Ke	La Tinh		W		CkeL
<b>B</b>	<b>South of La Tinh River Basin and North of Kone River</b>		<b>9</b>	<b>0</b>	<b>3</b>	
3	Hoi Son Upstream	La Tinh	R			HSup
4	Thuan Ninh	Kone	R			ThuN
5	My Thuan	Kone	R			MyT
6	Tuong Son	Kone	R			Tson
7	Suoi Chay	Kone	R			SuoC
8	Hon Ga	Kone	R			HonG
9	Chanh Nhon	Kone	R			CNh
10	Dai An	Kone	R			DaiA
11	Cua Khau	Kone	R			CuaK
12	Dai Binh	Kone			P	
13	Thi Lua	Kone			P	ThiL
14	Ngai Chanh	Kone			P	NgaC
<b>C</b>	<b>Tan An - Dap Da</b>		<b>0</b>	<b>15</b>	<b>13</b>	
15	Thanh Hoa I	Kone		W		ThanhI
16	Thanh Hoa II (water level regulation only)	Kone		W		ThanhII
17	Thach De	Kone		W	P	ThaD
18	Thuan Hat	Kone		W		ThuaH
19	Thap Mao	Kone		W		ThaM
20	Lao Tam	Kone		W		LaoT
21	Nha Phu	Kone		W		NhaP
22	Ha Bac	Kone		W		HaB
23	Bo Ngo	Kone		W		BoN
24	Bay Yen	Kone		W	P	BaY
25	Binh Thanh	Kone			P	BinT
26	Dap Cat	Kone		W		DapC
27	Van Kham	Kone		W		VanK
28	Van Moi	Kone		Wtemp		VanM
29	Nhon Phong (Ban Nui)	Kone		W		NhoP
30	Da Den	Kone		W		DaD
31	Dai Binh	Kone			P	DaiB
32	Ben Tranh	Kone			P	BenT
33	Thanh Danh	Kone			P	ThaD
34	Ben Go	Kone			P	BenG
35	An Loi	Kone			P	AnL
36	Trung Ly	Kone			P	TruL
37	An Hoa	Kone			P	AnH
38	An Thuan I+II	Kone			2P	AnT
39	Long Quang	Kone			P	LonQ
<b>D</b>	<b>South of Kone River Basin</b>		<b>3</b>	<b>1</b>	<b>0</b>	
40	Loc (Kien) Giang	Kone		W		LocG
41	Nui Mot	Kone	R			NuiM
42	Lo Mon	Kone	R			LoM
43	Thu Thien	Kone	R			ThuT
<b>E</b>	<b>Downstream Reaches of Ha Thanh River Basin</b>		<b>4</b>	<b>0</b>	<b>0</b>	
44	Long My 2	Ha Thanh	R			LonM
45	Hoc (Cay) Thich	Ha Thanh	R			CayT
46	Hoc (Ho) Cay Da	Ha Thanh	R			CayD
47	Hoc (Cay) Ke	Ha Thanh	R			CayK
<b>F</b>	<b>Van Canh Region</b>		<b>2</b>	<b>0</b>	<b>0</b>	
48	Ba thien	Ha Thanh	R			BaTh
49	Suoi Nhen	Ha Thanh	R			SuoT
<b>G</b>	<b>Vinh Thanh Region</b>		<b>1</b>	<b>0</b>	<b>0</b>	
50	Hon Lap	Kone	R			HonL
			<b>19</b>	<b>18</b>	<b>16</b>	
<b>Total Irrigation Works as of 2001</b>			→			<b>53</b>

Note. D: Dam, W: Weir (Wtemp: Temporary weir), P: Pumping Station (booster pump in the canal work is not counted).