

Appendix N

Economic and Financial Evaluation

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Appendix N Economic and Financial Evaluation

1 EVALUATION FOR THE BASIN MANAGEMENT PLAN

1.1 Economic Evaluation

(1) Introduction

Economic evaluation is conducted for the water resources development and management measures for the Kone River Basin. The objective of the economic evaluation is to analyze the feasibility of the measures from the viewpoint of national economy. The measures are analyzed by quantitative method by cost-benefit analysis deriving such indices as EIRR, B/C ratio, and NPV, which are commonly used for economic analyses of the same types of development projects. The economic analysis has been examined for 26 alternatives including without dam alternative. The following direct benefits were taken into consideration for the economic analysis of the alternatives:

- Incremental agricultural benefit including crop, livestock, and aquaculture,
- Hydropower generation,
- Domestic and industrial water supply, and
- Flood damage mitigation

(2) Results of Economic Analysis

Based on the estimated benefits and costs of the alternatives, economic viability was examined by cost-benefit analysis applying the discounted cash flow method. Features of the alternatives and results of economic analysis are shown in Table N.1. Almost all the alternatives except "without dam alternatives" indicated sufficient economic efficiency with EIRR of more than 14%. Among the alternatives, I-1.3B indicated the largest Net Present Value (NPV) of US\$92.4 million and can be evaluated as the most effective scheme from the economical point of view. Economic benefits of the alternative are summarized below:

Annual Economic Benefit of Alternative I-1.3B

Benefit item	Qty	US\$ m
Agriculture incl. livestock and aquaculture	54,500ha	23.59
Hydropower generation	37.8GWh	1.89
Domestic and industrial water supply (2020)	448,000m ³ /day	37.52
Flood damage mitigation	5districts	13.39
Total		76.38

The results of the economic analysis of the alternative is as shown blow:

Results of Economic Analysis of Alternative I-1.3B

Alternative	EIRR (%)	B/C Ratio	NPV (US\$ m)
I-1.3B	15.1	1.52	92.4

Note: B/C and NPV are calculated with a discount rate of 10%.

Sensitivity analysis has been examined for the alternative I-1.3B in several cases of increase in costs and decrease in benefits. The results of the analysis are shown below:

Sensitivity Analysis for Alternative I-1.3B

Case	EIRR (%)	B/C ratio	NPV (US\$ m)
a) Base estimate	15.1	1.52	92.4
b) Cost increase of 10%	13.8	1.38	74.6
c) Cost increase of 20%	12.7	1.27	56.7
d) Benefit decrease of 10%	13.7	1.37	65.3
e) Benefit decrease of 20%	12.2	1.21	38.2
f) Combination of c) and e)	10.1	1.01	2.6

The alternative indicated sufficient economic efficiency even under the conditions of cost increase by 20% and benefit decrease by 20%. From the results, the project is considered viable from the economic viewpoint.

(3) Methodology of Economic Analysis

(A) Basic Conditions of Economic Analysis

The economic analysis has been conducted based on the following basic conditions:

a) Price Level and Exchange Rate

The analysis is made at the price level of December 2001 and applied foreign exchange rate is one U.S. dollar equivalent to VND15,068 and 100 Japanese Yen equivalent to VND12,212.

b) Project Life

The project life depends on the insurability of the facilities. The proposed dam is designed to be used for 100 years but the project live of more than 50 years does not give significant difference in results of economic analysis. Therefore, the project life of 50 years after construction of all the facilities is assumed for the economic analysis. Average lifetime of the electrical and mechanical facilities related to the projects is assumed 25 years after installation. As for domestic and industrial water supply facilities, average lifetime of 30 years is assumed. Replacement costs cover the cost for replacement of such facilities after the lifetime within project life. The residual value of the facilities at the end of project life was neglected since it does not give

significant effect for the results of the analysis.

c) Discount Rate

A discount rate of 10% is applied. The rate has been adopted for the similar studies in Vietnam.

d) Standard Conversion Factor (SCF)

The standard conversion factor (SCF) of 0.9 with reference to recent similar studies is applied to adjust the effects of trade distortion, foreign exchange premiums, the local costs for non-traded goods and services.

e) Transfer Payment

From the viewpoint of national economy, the transfer payment such as taxes, duty, subsidy and interest is merely a domestic monetary movement without direct productivity. Therefore, it is excluded from the costs of goods and services.

f) Economic Prices of Agricultural Outputs and Inputs

The prices of agricultural outputs are considered dividing into traded items and non-traded items. For traded items like paddy, maize, groundnuts, soybeans, tobacco, and sugarcane, the economic value is estimated from the border parity price. Agricultural inputs such as agrochemical and fertilizer, their economic value are estimated from import parity prices. For non-traded items, the economic value is estimated from domestic market price adjusted by SCF. Calculation of economic farm gate prices of agricultural products and inputs is presented in Tables N.2 and N.3.

g) Economic Price of Electricity

The economic price of electricity is assumed at 5 US Cents/kWh, which is generally used as a price of electricity in economic analyses.

h) Economic Price of Domestic and Industrial Water Supply

The economic price of domestic and industrial water is assumed at VND1,800/m³ and VND3,150/m³, respectively, estimated from typical tariff adjusted by SCF. The study team tried to hear people's willingness to pay (WTP) through interview survey in the project areas. However, people generally do not have idea to pay money for domestic water even though they are not satisfied with the quantity and quality of current water sources (mainly from wells). Therefore, the typical water tariff was used for value of water, since the tariff of water is at least accepted by the current users. Furthermore, average monthly cost based on the tariff is estimated to be less than 5% of monthly income of average household.

i) Economic Project Cost

The economic project cost has been estimated from the financial project cost adjusting by SCF after deducting the direct transfer payment.

j) Operation and Maintenance Cost

The following annual operation and maintenance costs are assumed:

- Civil construction including dam and irrigation facilities: 0.5% of construction cost
- Mechanical and electrical facilities including irrigation and hydropower facility: 1.5% of facility cost
- Domestic and industrial water supply: 5% of the capital cost

k) Replacement Cost

The following replacement costs are assumed for replacement of facilities at their lifetime:

Lifetime of Mechanical and Electrical Facilities	
Items	Replacement
- Mechanical and electrical facility for dam and hydropower generation	after 25 years
- Pumps and gates for irrigation	after 25 years
- Water supply facilities	after 30 years

(B) Project Benefits

a) Incremental Agricultural Benefit

According to the agronomic study using model crops and cropping patterns based on the characteristics of the project area, after implementation of the projects, improvement in crop yields and production of higher value crops are expected. The incremental net income has been estimated as agricultural benefit of the project.

Table N.4 shows economic crop budget under without-project condition. The economic crop budget under with-project condition is presented in Table N.5 and the incremental net income per hectare is estimated as shown in Table N.6. The incremental benefit has been estimated by the unit incremental net income multiplied by irrigation development areas as shown in Table N.7.

Productions of livestock such as cattle, buffalo, pig, goat and poultry are also expected to increase by using the irrigation water for animal husbandry. Table N.8 shows estimation of livestock benefit.

Production increase of shrimps is expected by supplying fresh water for aquaculture in the brackish water areas. The benefit of aquaculture has been estimated as shown in

Table N.9.

Annual benefit of agriculture including livestock and aquaculture is presented in Table N.10.

b) Hydropower Generation Benefit

Electricity production in Vietnam by 2001 was 389kWh per head, about half the level of Indonesia and one-fifth of that of Thailand. Although electricity output rose by nearly 60% between 1997 and 2001, it has had difficulty in keeping up with demand.

The government has a master plan to increase power generation double by 2010 and five times from present level by 2020. Especially the government gives priority to develop hydropower plants, which bring about combined benefits such as flood control, water supply, irrigation, and power generation. The plan also mentions that exchange of electricity with neighboring countries will be necessary in order to meet power demand in each region and whole country.

The economic price of electricity is assumed at US 5 Cents/kWh, which is generally used as a price of electricity in economic analyses. Annual mean energy produced by the projects is calculated as shown below:

Economic Benefits of Power Generation by Alternative		
Alternative	Power generation (GWh/year)	Economic benefit (US\$million/year)
I-1.1A, I-1.1B, II-1.1A, and II-1.1B	36.5	1.82
I-1.2A, I-1.2B, II-1.2A, and II-1.2B	42.0	2.10
I-1.3A, I-1.3B, II-1.3A, and II-1.3B	37.8	1.89
I-1.4A, I-1.4B, II-1.4A, and II-1.4B	44.6	2.23
I-1.5A, I-1.5B, II-1.5A, and II-1.5B	37.2	1.89
I-1.6A, I-1.6B, II-1.6A, and II-1.6B	44.7	2.23
I-2 and II-2 (without dam)	-	-

c) Water Supply Benefit

Forecast of domestic water demand for the Kone River basin was made by the Study Team based on population projection in the river basin. The industrial water demand was forecasted dividing into the rural industrial demand and the demand for industrial zone based on previous study and a plan of the Department of Industry of the Province. Furthermore, future water demand for pulp mill in the project area is also taken into account.

Future Water Demand and Economic Benefit							
Year	<u>Domestic Water Supply</u>			<u>Industrial Water Supply</u>			Total
	Urban center	Rural area	Sub-total	Industrial zone	Rural industry	Sub-total	
1. Water demand (MCM/year)							
2010	11.31	4.63	15.94	41.70	12.13	53.83	69.77
2012	13.86	5.73	19.59	54.69	20.36	75.05	94.64
2020	24.08	10.09	34.17	106.62	53.31	159.93	194.10
2. Economic benefit (US\$ million/year)							
2010	1.35	0.55	1.90	8.71	2.54	11.25	13.15
2012	1.66	0.68	2.34	11.43	4.26	15.69	18.03
2020	2.88	1.21	4.08	22.28	11.15	33.43	37.51

Future demand increase of domestic water supply in the Kone River Basin has been estimated at 19.59 million m³/year in the year 2012, when the water supply service will be started, 34.17 million m³/year in 2020. On the other hand, the future demand increase of industrial water supply in the Kone River Basin has been estimated at 75.05 million m³/year in the year 2012 and 159.93 million m³/year in 2020 as discussed in Chapter 9. The economic value of water is assumed at VND1,800/m³ for domestic water and VND3,150/m³ for industrial water. Therefore, annual benefits of the water supply are estimated as shown in the table above:

With implementation of the project, 476 thousand of urban population and 818 thousand of rural population will be supplied potable water.

d) Flood Control Benefit

Flood Conditions

Kone River Basin suffers from flood damage almost every year. Especially in the downstream areas from Thi Nai Swamp to 3.5km upstream side, the ground elevation is one meter or less and flood inundation occurs every year in the rainy season. Kone River Delta from that point up to Binh Thanh, where Dap Da River and Tan An River separate, suffers from inundation every two or three years. Middle stream area from Binh Thanh to Tay Son Town suffers from flood damage every five years. Furthermore, Vinh Thanh area located just downstream of the proposed Dinh Binh Reservoir site also suffers from flood damage when big floods occur. Flood prone area of the Kone River Basin is shown in Figure N.1.

The flood, which caused the most serious damage in this decade, is that in 1999 as is the case with the other central provinces. The flood was evaluated as the magnitude between 5-year and 10-year return period (20-10% occurrence probability) in the Kone River Basin from the rainfall analysis. Results of flood damage survey in the districts in the Kone River Basin obtained from the provincial DARD is shown in Table N.11 and summarized below:

Summary of Flood Damage in Kone River Basin in 1999

Item	Qty	Unit	Damage (VND million)
1. Human life			-
- Dead	37	persons	
- Injured & sick	265	persons	
- Household needs assistance	7,930	households	
2. Houses	19,796	houses	15,960
3. Agriculture, aquaculture and grain & seed	6,059	ha	38,862
4. Irrigation system			16,711
5. Transport system	263,453	m	11,847
6. School and hospital			472
7. Electricity & telephone system			26
Total			83,877

Note: The damages in Phu Cat, An Nhon, Tuy Phuoc, Tay Son, Vinh Thanh are included.

Alternatives to be studied

In the Kone River Basin, floods are classified into four types; minor flood, early flood, major flood, and late flood. Characteristics of each flood are as summarized below:

Characteristics of Floods in Kone River Basin

Kind of Floods	Timing	Characteristics
Minor flood	May - Jun.	Generally, magnitude of flood is not serious.
Early flood	Jul. - Aug.	The flood causes damages for both general assets, crop production, and infrastructure.
Major flood	Sep. - Nov.	The flood occurs almost every year and causes damages for both general assets and infrastructure. Crop damage is not very significant, since farmers do not cultivate in this season for avoiding possible damage.
Late flood	Dec.	The flood cause relatively large damages for both general assets, crop production, and infrastructure.

Flood control measures aim to improve river channels in the Kone River Delta in order to flow floodwater safely up to the magnitude of 20-year late flood (5% occurrence probability). Moreover, the measures should prevent dike break up to the magnitude of 10-year major flood (10% occurrence probability) by discharging floodwater from side overflow spillways to be constructed along the dike in downstream areas.

In order to find the optimum flood control measures, economic analyses are conducted for the following alternatives.

Alternatives for Flood Control

Alternative	Effective storage of dam (MCM)	Flood control capacity of dam (MCM)	Sea Dike Spillway	Other	
1.1A	209.9	221.7	Existing sea dyke spillway	Excavation, construction and improvement of embankment, side overflow spillway, sluice gates for all the alternatives	
1.2A	209.9	121.2			- ditto -
1.3A	279.5	292.8			- ditto -
1.4A	279.5	192.8			- ditto -
1.5A	360.2	375.5			- ditto -
1.6A	360.2	275.5			- ditto -
1.1B	209.9	221.7	New sea dike spillway		
1.2B	209.9	121.2			- ditto -
1.3B	279.5	292.8			- ditto -
1.4B	279.5	192.8			- ditto -
1.5B	360.2	375.5			- ditto -
1.6B	360.2	275.5			- ditto -
2B	without dam	without dam	- ditto -		

Out of these alternatives, actual estimation of flood mitigation benefit is conducted for seven alternatives of 1.1A, 1.3A, 1.5A, 1.1B, 1.3B, 1.5B, and 2B. Then, the flood control benefits of the remaining alternatives are estimated by interpolation or extrapolation.

Estimation of Flood Damage Mitigation Benefit

Flood damage mitigation benefits of the project have been estimated by the procedure discussed below.

- 1) Estimation of probable flood damage in the flood protection area, Kone River Delta and midstream areas (from Tay Son to Binh Thanh), has been conducted by dividing the flood prone area into 226 blocks (141 blocks in the delta and 85 blocks in midstream areas, each block is 1 km²). Average ground elevation of farmland taken from topographic maps of 1/25,000 and 1/50,000 is adapted to each block. The block division is shown in Figure N.2.
- 2) Each block is adapted to a commune and average household density and average farmland area of the commune is set for each block.
- 3) Based on flood simulation analysis, average inundation depth over the blocks has been obtained. The depth, however, is an average over a block and actual inundated depth is supposed to vary depending on the topography of the area. Therefore, inclination is assumed for each block with the following height. The height was assumed based on point elevations shown on the topographic maps of 1/25,000 and 1/50,000.

Assumed Land Inclination

	Housing Areas	Farmland
Kone River Delta	2/1,000	1/1,000
Midstream areas	3/1,000	1/1,000

- 4) From the results of site reconnaissance, the average floor elevation of houses is assumed 1.3m higher than ground level.
- 5) Damage rate due to flood inundation has been assumed as shown below based on the flood damage survey in 1999 obtained from DARD and the results of hearing from inhabitants in the field.

Flood Damage Rates

Item	Inundation depth (m)	Damage rates (%)
House	less than 1	2.5
	1 - 1.99	50
	2 or more	100
Farmland	less than 1.5	30
	1.5 or more	100

- 6) Unit prices of houses and agricultural assets are taken from the flood damage survey in 1999.
- 7) The damages due to sedimentation of farmlands, damages to irrigation facilities, aquaculture, school, medical facilities, power supply, and communication facilities are estimated by ratio to housing or agricultural damages based on the actual flood damage in 1999.

Estimation of Other Damages

Damaged Item	Applied ratio
a) Sedimentation on farmland	130% of crop damage
b) Irrigation facilities	120% of crop damage
c) Aquaculture	40% of crop damage
d) Infrastructure (school, hospital, electric and communication facilities)	70% of housing damage

Note: The ratios are based on actual damage occurred in Kone River basin in 1999.

- 8) Flood condition of upstream reaches in Vinh Thanh District will be improved since the flood peak discharge is regulated by the proposed Dinh Binh Reservoir. Such effect is assumed at 7% of the flood control benefit of the delta and midstream areas based on the actual flood damage record in 1999.
- 9) It will be easily understood that the flood damage potential will increase in the future due to population growth and socioeconomic development in the area. The population in the river basin is assumed to increase 1.09% per year based on the provincial plan.

In the future, assets and fortune will be amassed in the basin according to socioeconomic development. Its speed is assumed a half of economic development. The rate of 4.75%/year is assumed for housing and 2.45%/year is assumed for agricultural assets.

- 10) Probable flood damage has been estimated from the damageable property in inundated area multiplied by the damage rate corresponding to inundation condition under various magnitudes of flood events with occurrence probabilities of 50%, 20%, 10%, 5%, 2%, and 1%. The probable flood damages against both present assets and projected future assets in the year 2020 have been estimated based on the damageable properties discussed above. Tables N.12 and N.13 are the example of estimation of probable flood damage by the blocks in Kone River delta and midstream areas, respectively. The example is under without project condition at 20-year late flood (5% occurrence probability) for present asset. In the same way, other cases under different magnitude of flood have under with and without project conditions been calculated. The results of the estimation are shown in Table N.14. Flood damage - probability curve under without project condition is shown in Figure N.3.
- 11) Annual mean flood damage is estimated as accumulation of flood damage segments derived from various magnitude of probable flood damage multiplied by the corresponding probability of occurrence, from non-damageable flood up to design probable flood. Difference of the annual mean flood damage between those with and without project is counted as annual flood reduction benefit. Calculation of annual mean flood damage by alternative is presented in Table N.15 and summary of flood mitigation benefit by alternative is shown in Table N.16.
- 12) Based on the results above, the flood control benefits of the remaining alternatives have been estimated by interpolation and extrapolation. The flood control benefits of all the alternatives are presented below:

Flood Control Benefit by Alternative			
Alternative	FC Vol. of Dam (MCM)	Flood Control Benefit (US\$ m)	
		2001	2020
1.1A	221.7	4.70	11.36
1.2A	121.2	3.31	7.94
1.3A	292.8	5.38	13.25
1.4A	192.8	4.39	10.64
1.5A	375.5	5.92	14.41
1.6A	275.5	5.21	12.71
1.1B	221.7	4.84	11.75
1.2B	121.2	3.57	8.66
1.3B	292.8	5.44	13.39
1.4B	192.8	4.55	11.08
1.5B	375.5	5.95	14.49
1.6B	275.5	5.30	12.94
2B	Without dam	0.73	1.48

13) With implementation of the "with dam alternatives", flood condition in 30 communes of five districts will be improved and 260,000 people will be directly benefit by the project.

All the benefits by the alternatives, incremental agricultural production, hydropower, domestic and industrial water supply, and flood damage mitigation, are summarized in Table N.17.

e) Other Intangible Benefits

Other than benefits discussed above, various effects are expected by the implementation of the projects as listed below:

- Contribution to national food security,
- Reduction of food import and saving foreign exchange holdings,
- Improvement of self-sufficiency and nutritional level of rural farmers,
- To narrow the earnings differentials among regions,
- Convenience of rural population by improvement of access roads to the dam sites and the roads may reduce the cost of moving produce from the farm to the consumer,
- Improvement of public health and quality-of-life by supplying better quality water including decrease of water-related disease,
- To ease the water carrying works,
- Groundwater recharge, and
- Stabilization of rural farmers' livelihood and prevention of influx of rural population into urban areas.

The benefits listed above are very valuable, they are nevertheless virtually impossible to value satisfactory in monetary terms.

f) Indirect Benefit

During construction period, the construction works may fuel various demand for other industries. Meanwhile, after construction works, incremental agricultural production will also arouse various demands for many different industries such as chemical industries, transport services, trade services, etc. Flood control effect may prevent inundation of highway or railway and paralysis of economic activity may be prevented or mitigated. Such ripple effects must be enormous. However, such benefits are also very hard to value in money terms.

g) Creation of New Job Opportunity

During construction period, the construction works will create the following new job opportunity for skilled and unskilled labors:

Creation of New Job Opportunity	
Project Component	New job opportunity (Man-days)
1) Dinh Binh Reservoir Project	700,000
2) Irrigation & Drainage Improvement Project	3,100,000
3) Flood Control Project	800,000
4) Water Supply Project	800,000
Total	5,400,000

(C) Economic Project Cost

The economic project cost has been estimated from the financial project cost adjusting by SCF after deducting the direct transfer payment.

Annual project costs of the alternatives have also been prepared based on envisaged implementation schedule until the target year 2020.

The financial and economic project costs of the optimum alternative, I-1.3B are presented in Table N.18 and its annual project costs are shown in Table N.19.

(D) Cost-Benefit Analysis

Based on the benefits and costs discussed above, economic viabilities of the projects are examined by cost-benefit analysis. The results of the economic analysis of the alternatives are summarized in Subsection 1.1 (1) and Table N.1. The cash flow of the optimum alternative is presented in Table N.20.

1.2 Financial Evaluation

The financial evaluation has been conducted for the optimum alternative I-1.3B.

The financial feasibility of the projects is evaluated by examining the repayment capability of the capital cost for the projects. A financial cash flow statement for the proposed

development plan using the anticipated project revenue and costs requirement is prepared based on the following assumptions:

(1) Price Escalation

Since the future price escalation is uncertain and results of the analysis so much vary depending on the assumed price escalation, a constant price as of 2001 has been applied for this financial analysis.

(2) Condition of Foreign Loan

In the examination of repayment capability, it is assumed that the capital required for the project implementation will be arranged under the following conditions:

- 85% of the capital costs are financed by bilateral or international institution as far as the costs are eligible items. The non-eligible items are costs for land acquisition, house compensation, administration, and any types of taxes and duties.
- The assumed condition of finance is with an interest rate of 1.8% per annum for a repayment period of 30 years including a grace period of 10 years.
- The balance of the capital cost is financed by the budget allocation of the Government without interest and repayment.

(3) O & M Cost

The following annual operation and maintenance costs are assumed:

- Civil construction including dam, flood control and irrigation facilities: 0.5% of construction cost
- Mechanical and electrical facilities for dam, hydropower, and irrigation facilities: 1.5% of facility cost
- Domestic and industrial water supply: 5% of the construction cost

(4) Replacement Cost

The following replacement costs are assumed for replacement of facilities after their lifetimes:

Lifetime of Mechanical and Electrical Facilities	
Items	Replacement
- Mechanical and electrical facility for dam and hydropower generation	after 25 years
- Pumps and gates for irrigation	after 25 years
- Wooden gate for flood control	after 10 years
- Mechanical gate for flood control	after 25 years
- Water supply facilities	after 30 years

(5) Irrigation Fee

Weighted average amount of the latest tariff in Binh Dinh Province, VND274,488/ha/crop,

has been used for financial analysis. The total improvement area is 90,200ha (by two and/or three crops), and the total irrigation fee is estimated to be VND24.8 billion (equivalent to US\$1.64 million) per year.

Since a part of irrigation facilities will be completed in 2008, the water charge is assumed to be collected from that year and to be increase according to progress of the irrigation improvement works as shown below.

Estimation of Future Irrigation Water Charge

Year / Progress of agricultural improvement according to improvement of irrigation facilities	Irrigation water charge (US\$ million)
Estimated irrigation fee in 2001 constant price for 90,200ha	1.64
In 2008 / 9%	0.15
In 2009 / 25%	0.41
In 2010 / 45%	0.74
In 2011 / 56%	0.92
In 2012 / 85%	1.39
In 2013 / 93%	1.53
In 2014 / 96%	1.57
In 2015 / 97%	1.59
In 2016 / 98%	1.61
In 2017 / 98%	1.61
In 2028 / 99%	1.62
In 2019 / 100%	1.64
:	:

(6) Electric Charge

Annual mean energy production by the project is calculated at 37.84GWh. EVN's electric charge for domestic firm is 5.2 US Cents/kWh at present. The future electric charge to be produced by the project is estimated as follows:

Estimation of Future Electricity Charge

Year	
Average annual power generation (GWh)	37.84
Estimated revenue from electric charge (US\$ m)	
- In 2012	1.97
- In 2013	1.97
- In 2014	1.97
:	:
- In 2020	1.97
:	:

(7) Domestic and Industrial Water Charge

As discussed in Subsection 16.3.1 (2), the future demand increase of domestic and industrial water in the Kone River Basin has been estimated by the study team. The present tariff of water supply is assumed at VND2,000/m³ for domestic use and VND3,500/m³ for industrial use. The future revenue from the water supply is estimated as shown below:

Estimation of Future Irrigation Water Charge

Year	Domestic water		Industrial water	
	Demand (MCM)	Revenue (US\$ m)	Demand (MCM)	Revenue (US\$ m)
2010	15.94	1.90	53.83	11.25
2015	25.05	2.99	106.88	22.34
2020	34.16	4.08	159.93	33.43

(8) Conclusion of Financial Analysis

The financial cash flow statement of the project based on the above basic conditions is shown in Table N.21. From the financial cash flow statement, the following matters became evident:

- Irrigation fee can fully cover O & M cost of irrigation as well as that of dam,
- The revenue from power generation and domestic & industrial water supply can fully cover their O & M costs,
- Especially, the current tariff of industrial water supply brings large profits and adjustment of the tariff will be necessary in the future,
- For repayment of the loan capital, interest payment, and replacement of major mechanical & electrical facilities, government financial support will be necessary.

If a soft loan is available, implementation of the project will be financially possible.

2 EVALUATION FOR THE PRIORITY PROJECTS

2.1 Economic Evaluation

2.1.1 Introduction

Economic analysis has been conducted for the priority projects selected from the alternatives examined in the master plan study. Feature of the priority project is summarized below:

Feature of Priority Project	
Item	Feature
1. Dinh Binh Dam	
1) Dam crest elevation	100.3 m
2) Effective storage volume	279.5 MCM
3) Flood control volume	292.8 MCM
4) Hydropower generation	37.8 GWh/year
5) Appurtenant facilities	
2. Irrigation and Drainage Development	
1) Van Phong Weir	
2) New development and rehabilitation of irrigation facilities	37,400 ha
3) Appurtenant facilities	
3. Flood Control for Kone River Delta	
1) Improvement of dyke system and side overflow spillways	To flow 5% late flood safely and to keep safety of dike system against 10% major flood in combination with flood control effect of the dam.
2) Improvement and new construction of sluice gates	
3) Improvement and new construction of sea dyke spillways	
4) Appurtenant facilities	

Methodology applied for the economic analysis of the project is basically the same as that applied in the master plan study. The following direct benefits were taken into consideration for the economic analysis:

- Incremental agricultural benefit including crop, livestock, and aquaculture,
- Hydropower generation, and
- Flood damage mitigation

Based on the estimated benefits and costs of the project, economic viability was examined by cost-benefit analysis applying the discounted cash flow method.

2.1.2 Results of Economic Analysis

Economic benefit of the project is estimated as summarized below:

Annual Economic Benefit of Priority Project		
Benefit item	Qty	US\$ million
Agriculture incl. livestock and aquaculture	37,400ha	17.12
Hydropower generation	37.8GWh	1.89
Flood damage mitigation	5Districts	13.39
Total		32.40

Financial project cost has been converted into economic price by applying SCF (0.9). The

financial and economic project costs are summarized below:

Financial and Economic Project Costs (2001 Constant Price)

	Cost (US\$ million)					Total
	Constr.	Resettlmt	E/S	Admin.	Phys. conti	
Financial Cost						
1. Dinh Binh reservoir	50.62	8.94	5.06	1.79	6.21	72.62
2. Flood control facil.	46.45	1.83	4.65	1.45	5.44	59.81
3. Irrigation & drainage	71.32	5.26	7.13	2.30	8.60	94.62
Total	168.40	16.03	16.84	5.53	20.25	227.04
Economic Cost						
1. Dinh Binh reservoir	45.56	8.04	4.56	1.61	5.59	65.35
2. Flood control facil.	41.81	1.65	4.18	1.30	4.89	53.83
3. Irrigation & drainage	64.19	4.74	6.42	2.07	7.74	85.15
Total	151.56	14.43	15.16	4.98	18.22	204.34

Remarks: Const.: construction, E/S: engineering services, Admin: administration,
Phys. conti: physical contingency

Based on the economic benefits and costs discussed above, economic viability of the project has been examined by cost-benefit analysis. The results of the economic analysis are summarized below and the economic cash flow of the priority project is presented in Table N.38.

Results of Economic Analysis of Priority Project

	EIRR (%)	B/C Ratio	NPV (US\$ m)
Priority Project	12.0	1.23	22.6

Note: B/C and NPV are calculated with a discount rate of 10%.

The project has sufficient economic efficiency with EIRR of 12.0%, NPV of US\$22.6 million.

Sensitivity analysis has been examined for the priority project in several cases of increase in costs and decrease in benefits. The results of the analysis are shown below:

Sensitivity Analysis for Priority Project

Case	EIRR (%)	B/C ratio	NPV (US\$ m)
a) Base estimate	12.0	1.23	22.6
b) Cost increase of 10%	11.1	1.12	12.8
c) Cost increase of 15%	10.6	1.07	8.0
d) Cost increase of 20%	10.2	1.03	3.1
e) Benefit decrease of 10%	11.0	1.11	10.6
f) Benefit decrease of 15%	10.4	1.05	4.6
g) Benefit decrease of 20%	9.9	0.99	-1.4
h) Combination of d) and g)	8.3	0.82	-21.0

The project indicated sufficient economic viability with EIRR of more than 10% even under the conditions of cost increase of 20% or benefit decrease of 15%. In the cases of benefit decrease of 20% or worse, EIRR drops below 10% and NPV becomes negative. However,

the project has not only tangible direct benefits but also many intangible benefits as discussed later on. Therefore, the project is considered viable from the economic point of view.

2.1.3 Procedure of Economic Analysis

(1) Basic Conditions of Economic Analysis

The economic analysis has been conducted based on the following basic conditions:

a) Price Level and Exchange Rate

The analysis is made at the price level of December 2001 and applied foreign exchange rate is one U.S. dollar equivalent to VND15,068 and 100 Japanese Yen equivalent to VND12,212.

b) Project Life

The project life depends on the insurability of the facilities. The proposed dam is designed to be used for 100 years but the project live of more than 50 years does not give significant difference in results of economic analysis. Therefore, the project life of 50 years after construction of all the facilities is assumed for the economic analysis. Average lifetime of the electrical and mechanical facilities related to the projects is assumed 25 years after installation. Replacement costs cover the cost for replacement of such facilities after the lifetime within project life. The residual value of the facilities at the end of project life was neglected since it does not give significant effect for the results of the analysis.

c) Discount Rate

A discount rate of 10% is applied. The rate has been adopted for the similar studies in Vietnam.

d) Standard Conversion Factor (SCF)

The standard conversion factor (SCF) of 0.9 with reference to recent similar studies is applied to adjust the effects of trade distortion, foreign exchange premiums, the local costs for non-traded goods and services.

e) Transfer Payment

From the viewpoint of national economy, the transfer payment such as taxes, duty, subsidy and interest is merely a domestic monetary movement without direct productivity. Therefore, it is excluded from the costs of goods and services.

f) Economic Prices of Agricultural Outputs and Inputs

The prices of agricultural outputs are considered dividing into traded items and

non-traded items. For traded items like paddy, maize, groundnuts, soybeans, tobacco, and sugarcane, the economic value is estimated from the border parity price. Agricultural inputs such as agrochemical and fertilizer, their economic value are estimated from import parity prices. For non-traded items, the economic value is estimated from domestic market price adjusted by SCF. Calculation of economic farm gate prices of agricultural products and inputs is presented in Tables N.22 and N.23.

g) Economic Price of Electricity

The economic price of electricity is assumed at 5 US Cents/kWh, which is generally used as a price of electricity in economic analyses.

h) Economic Project Cost

The economic project cost has been estimated from the financial project cost adjusting by SCF after deducting the direct transfer payment.

i) Operation and Maintenance Cost

The following annual operation and maintenance costs are assumed:

- Civil construction including dam and irrigation facilities: 0.5% of construction cost
- Mechanical and electrical facilities including irrigation and hydropower facility: 1.5% of facility cost

j) Replacement Cost

The following replacement costs are assumed for replacement of facilities at their lifetime:

Lifetime of Mechanical and Electrical Facilities

Items	Replacement
- Mechanical and electrical facility for dam and hydropower generation	after 25 years
- Pumps and gates for irrigation	after 25

(2) Project Benefits

(A) Incremental Agricultural Benefit

According to the agronomic study using model crops and cropping patterns based on the characteristics of the project area, after implementation of the projects, improvement in crop yields and production of higher value crops are expected. The incremental net income has been estimated as agricultural benefit of the project.

Table N.24 shows economic crop budget under without-project condition. The economic crop budget under with-project condition is presented in Table N.25 and the

incremental net income per hectare is estimated as shown in Table N.26. The incremental benefit has been estimated by the unit incremental net income multiplied by irrigation development areas as shown in Table N.27.

Productions of livestock such as cattle, buffalo, pig, goat and poultry are also expected to increase by using the irrigation water for animal husbandry. Table N.28 shows estimation of livestock benefit.

Production increase of shrimps is expected by supplying fresh water for aquaculture in the brackish water areas. The benefit of aquaculture has been estimated as shown in Table N.29.

Annual benefit of agriculture including livestock and aquaculture is presented in Table N.30.

(B) Hydropower Generation Benefit

The economic price of electricity is assumed at US 5 Cents/kWh, which is generally used as a price of electricity in economic analyses. Annual mean energy produced by the projects is calculated at 37.8 GWh/year and annual economic benefit is US\$1.89 million.

(C) Flood Control Benefit

The project aims to improve river channels in the Kone River Delta in order to flow floodwater safely up to the magnitude of 20-year late flood (5% occurrence probability). Moreover, the project should prevent dike break up to the magnitude of 10-year major flood (10% occurrence probability) by discharging floodwater from side overflow spillways to be constructed along the dike in downstream areas. The project also has effect to mitigate flood damage in the midstream areas such as Tay Son and Vinh Thanh since flood peak discharge is regulated by the Dinh Binh Reservoir. Flood prone area of the Kone River Basin is presented in Figure N.1.

Flood control benefit of the project has been estimated by the same manner as the master plan study.

Estimation of Flood Damage Mitigation Benefit

Flood damage mitigation benefits of the project have been estimated by the procedure discussed below.

- 1) Estimation of probable flood damage in the flood protection area, Kone River Delta and midstream areas (from Tay Son to Binh Thanh), has been conducted by dividing the flood prone area into 226 blocks (141 blocks in the delta and 85 blocks in midstream areas, each block is 1 km²). Average ground elevation of

farmland taken from topographic maps of 1/25,000 and 1/50,000 is adapted to each block. The block division is shown in Figure N.2.

- 2) Each block is adapted to a commune and average household density and average farmland area of the commune is set for each block.
- 3) Based on flood simulation analysis, average inundation depth over the blocks has been obtained. The depth, however, is an average over a block and actual inundated depth is supposed to vary depending on the topography of the area. Therefore, inclination is assumed for each block with the following height. The height was assumed based on point elevations shown on the topographic maps of 1/25,000 and 1/50,000.

Assumed Land Inclination

	Housing Areas	Farmland
Kone River Delta	2/1,000	1/1,000
Midstream areas	3/1,000	1/1,000

- 4) From the results of site reconnaissance, the average floor elevation of houses is assumed 1.3m higher than ground level.
- 5) Damage rate due to flood inundation has been assumed as shown below based on the flood damage survey in 1999 obtained from DARD and the results of hearing from inhabitants in the field.

Flood Damage Rates

Item	Inundation depth (m)	Damage rates (%)
House	less than 1	2.5
	1 - 1.99	50
	2 or more	100
Farmland	less than 1.5	30
	1.5 or more	100

- 6) Unit prices of houses and agricultural assets are taken from the flood damage survey in 1999.
- 7) The damages due to sedimentation of farmlands, damages to irrigation facilities, aquaculture, school, medical facilities, power supply, and communication facilities are estimated by ratio to housing or agricultural damages based on the actual flood damage in 1999.

Estimation of Other Damages

Damaged Item	Applied ratio
a) Sedimentation on farmland	130% of crop damage
b) Irrigation facilities	120% of crop damage
c) Aquaculture	40% of crop damage
d) Infrastructure (school, hospital, electric and communication facilities)	70% of housing damage

Note: The ratios are based on actual damage occurred in Kone River basin in 1999.

8) Flood condition of upstream reaches in Vinh Thanh District will be improved since the flood peak discharge is regulated by the proposed Dinh Binh Reservoir. Such effect is assumed at 7% of the flood control benefit of the delta and midstream areas based on the actual flood damage record in 1999.

9) It will be easily understood that the flood damage potential will increase in the future due to population growth and socioeconomic development in the area. The population in the river basin is assumed to increase 1.09% per year based on the provincial plan.

In the future, assets and fortune will be amassed in the basin according to socioeconomic development. Its speed is assumed a half of economic development. The rate of 4.75%/year is assumed for housing and 2.45%/year is assumed for agricultural assets.

10) Probable flood damage has been estimated from the damageable property in inundated area multiplied by the damage rate corresponding to inundation condition under various magnitudes of flood events with occurrence probabilities of 50%, 20%, 10%, 5%, 2%, and 1%. The probable flood damages against both present assets and projected future assets in the year 2020 have been estimated based on the damageable properties discussed above. Tables N.31 and N.32 are the example of estimation of probable flood damage by the blocks in Kone River delta and midstream areas, respectively. The example is under without project condition at 20-year late flood (5% occurrence probability) for present asset. In the same way, other cases under different magnitude of flood have under with and without project conditions been calculated. The results of the estimation are shown in Table N.33. Flood damage - probability curve under without project condition is shown in Figure N.3.

11) Annual mean flood damage is estimated as accumulation of flood damage segments derived from various magnitude of probable flood damage multiplied by the corresponding probability of occurrence, from non-damageable flood up to design probable flood. Difference of the annual mean flood damage between those with and without project is counted as annual flood reduction benefit.

Calculation of annual mean flood damage by the project is presented in Table N.34 and the flood mitigation benefit by the project is summarized below:

Flood Control Benefit of Project				
Item	2001		2020	
	Without project	With project	Without project	With project
I. Downstream areas	3.77	0.83	8.15	1.68
I-1 Major flood	3.02	0.76	6.83	1.56
I-2 Early flood	0.04	-	0.06	-
I-3 Late flood	0.71	0.07	1.26	0.12
II. Midstream areas	2.97	0.83	8.14	2.10
II-1 Major flood	2.61	0.71	7.21	1.83
II-2 Late flood	0.36	0.12	0.93	0.27
Sub-total (I+II)	6.74	1.66	16.29	3.78
Damages in upstream (7%)	0.47	0.12	1.14	0.26
Total probable damage	7.21	1.78	17.43	4.04
Flood mitigation benefit		5.44		13.39

With implementation of the project, flood condition in 30 communes of five districts will be improved and 260,000 people will be directly benefit by the project.

All the benefits by the project, incremental agricultural production, hydropower, and flood damage mitigation, are summarized below:

Economic Benefit of Project (2020, US\$ million)			
Irrigation & drainage	Hydropower	Flood Control	Total
17.12	1.89	13.39	32.40

(D) Other Intangible Benefits

Other than benefits discussed above, various effects are expected by the implementation of the projects as listed below:

- Contribution to national food security,
- Reduction of food import and saving foreign exchange holdings,
- Improvement of self-sufficiency and nutritional level of rural farmers,
- To narrow the earnings differentials among regions,
- Convenience of rural population by improvement of access roads to the dam sites and the roads may reduce the cost of moving produce from the farm to the consumer,
- Improvement of living environment by flood mitigation and improvement of public health and quality-of-life including decrease of water-related disease,
- Groundwater recharge, and
- Stabilization of rural farmers' livelihood and prevention of influx of rural

population into urban areas.

The benefits listed above are very valuable, they are nevertheless virtually impossible to value satisfactory in monetary terms.

(E) Indirect Benefit

During construction period, the construction works may fuel various demand for other industries. Meanwhile, after construction works, incremental agricultural production will also arouse various demands for many different industries such as chemical industries, transport services, trade services, etc. Flood control effect may prevent inundation of highway or railway and paralysis of economic activity may be prevented or mitigated. Such ripple effects must be enormous. However, such benefits are also very hard to value in money terms.

(F) Creation of New Job Opportunity

During construction period, the construction works will create the following new job opportunity for skilled and unskilled labors:

Creation of New Job Opportunity	
Project Component	New job opportunity (Man-days)
1) Dinh Binh Reservoir Project	700,000
2) Irrigation & Drainage Improvement Project	1,960,000
3) Flood Control Project	800,000
Total	3,460,000

(3) Economic Project Cost

The economic project cost has been estimated from the financial project cost adjusting by SCF after deducting the direct transfer payment.

Annual project costs of the project have also been prepared based on envisaged implementation schedule until the target year 2020.

The financial and economic project costs of the project are presented in Table N.35 and its annual project costs are shown in Table N.36.

(4) Cost-Benefit Analysis

Based on the benefits and costs discussed above, economic viabilities of the projects are examined by cost-benefit analysis. The results of the economic analysis are summarized in Subsection 6.1.2. The economic cash flow of the project is presented in Table N.37.

2.2 Financial Evaluation

2.2.1 Financial Evaluation of Project

(1) Basic Conditions of Financial Evaluation

The financial evaluation has also been conducted for the priority project by the same manner as the master plan study. The financial feasibility of the projects is evaluated by examining the repayment capability of the capital cost for the projects. A financial cash flow statement for the project using the anticipated project revenue and costs requirement is prepared based on the following assumptions:

(A) Price Escalation

Since the future price escalation is uncertain and results of the analysis so much vary depending on the assumed price escalation, a constant price as of 2001 has been applied for this financial analysis.

(B) Condition of Foreign Loan

In the examination of repayment capability, it is assumed that the capital required for the project implementation will be arranged under the following conditions:

- 85% of the capital costs are financed by bilateral or international institution as far as the costs are eligible items. The non-eligible items are costs for land acquisition, house compensation, administration, and any types of taxes and duties.
- The assumed condition of finance is with an interest rate of 1.8% per annum for a repayment period of 30 years including a grace period of 10 years.
- The balance of the capital cost is financed by the budget allocation of the Government without interest and repayment.

(C) O & M Cost

The following annual operation and maintenance costs are assumed:

- Civil construction including dam, flood control and irrigation facilities: 0.5% of construction cost
- Mechanical and electrical facilities for dam, hydropower, and irrigation facilities: 1.5% of facility cost

(D) Replacement Cost

The following replacement costs are assumed for replacement of facilities after their lifetimes:

Lifetime of Mechanical and Electrical Facilities

Items	Replacement
- Mechanical and electrical facility for dam and hydropower generation	after 25 years
- Pumps and gates for irrigation	after 25 years
- Wooden gate for flood control	after 10 years
- Mechanical gate for flood control	after 25 years

(E) Irrigation Fee

Weighted average amount of the latest tariff in Binh Dinh Province, VND276,864/ha/crop, has been used for financial analysis. The total improvement area is 60,800ha (by two and/or three crops), and the total irrigation fee is estimated to be VND16.8 billion (equivalent to US\$1.12 million) per year.

Since a part of irrigation facilities will be completed in 2008, the water charge is assumed to be collected from that year and to be increase according to progress of the irrigation improvement works as shown below.

Estimation of Future Irrigation Water Charge

Year / Progress of agricultural improvement according to improvement of irrigation facilities	Irrigation water charge (US\$ million)
Estimated irrigation fee in 2001 constant price for 60,800ha	1.12
In 2008 / 3%	0.03
In 2009 / 12%	0.13
In 2010 / 27%	0.30
In 2011 / 38%	0.43
In 2012 / 84%	0.94
In 2013 / 96%	1.08
In 2014 / 100%	1.12
:	:

(F) Electric Charge

Annual mean energy production by the project is calculated at 37.84GWh. EVN's electric charge for domestic firm is 5.2 US Cents/kWh at present. The future electric charge to be produced by the project is estimated as follows:

Estimation of Future Electricity Charge

Year	
Average annual power generation (GWh)	37.84
Estimated revenue from electric charge (US\$ m)	
- In 2012	1.97
- In 2013	1.97
- In 2014	1.97
:	:
- In 2020	1.97
:	:

(2) Conclusion of Financial Evaluation

The financial cash flow statement of the project based on the above basic conditions is

shown in Table N.38. From the financial cash flow statement, the following matters became evident:

- Irrigation fee can fully cover O & M cost of irrigation as well as that of dam,
- The revenue from hydropower generation can fully cover its O & M cost and generate profits, and
- For repayment of the loan capital, interest payment, and replacement of major mechanical facilities after their lifetime, government subsidy will be necessary.

If a soft loan is available, implementation of the project is financially possible.

2.2.2 Farm Household Economy Analysis

Increase in crop production under the project will improve farmers' economy in future. In order to determine this effect, farm household budget is analyzed for the typical farm size based on the financial crop budgets as shown in Table N.39 for without-project condition and Table N.40 for with-project condition.

Typical farm size is assumed based on the sample household survey conducted in 1999 during the previous studies, covering 313 households in 9 communes of the project area. The result of this survey is examined, and adjusted by employing the latest statistical data and result of the field interviews to farmers.

The typical farm size is assumed for each land position and its cropping pattern, namely; higher land for cropping pattern A, middle land for cropping Pattern B, and lower land for cropping pattern C, as outlined below.

Change in Farm Household			
(Unit: 1,000 VND)			
Land Position	Higher Land	Middle Land	Lower Land
Cropping Pattern	A	B	C
Average Farm Size	0.33 ha	0.30 ha	0.25 ha
Average Family Size	5.5 persons	5.2 persons	5.9 persons
District	Tay Son, Phu Cat, Vinh Thanh,	An Nhon, Tuy Phuoc, Phu Cat, Qui Nhon	Tuy Phuoc, An Nhon, Phu Cat, Qui Nhon

Note: Average farm size includes the areas for paddy, other annual crop, perennial crops and miscellaneous garden.

Source: Feasibility Study on Binh Dinh Multipurpose Water Resources Project, April 2000.

Farm income from crop production is estimated based on the cropping pattern in each land position. Income from livestock and off-farm work is assumed to be same as the present. However, it is noted that the estimation is not precise but indicative, due to the limitation of data in the sample household survey. The farm household budget is presented in Table N.41 and is summarized below:

Farm Household Budget under Without-Project Condition

(Unit: 1,000 VND)

Land Position	Higher Land	Middle Land	Lower Land
1. Income	9,290	7,860	9,580
Farm Income - Crop	2,610	3,240	3,120
- Livestock	2,590	1,550	3,050
Off-Farm Income	4,090	3,070	3,410
2. Expenditure	3,270	3,320	3,870
Production Cost	1,740	1,790	2,340
Living Expenses	1,530	1,530	1,530
3. Net Reserve & Other Expenses	6,020	4,540	5,710

Source: Feasibility Study on Binh Dinh Multipurpose Water Resources Project, April 2000.

Under the without-project condition, proportion of crop income is 28% to 41% against total income depending on the cropping pattern and farm size. This proportion is low due to the small farm size, and not sufficient to sustain farm household family. The present interview survey to farmers indicated that many farm households have such other income as livestock, casual worker, shops, in order to supplement their income.

Balance between income and expenditure seems large in each case, and may contain not only reserves but also other expenses not specified in the original information. The farm household budget under with-project condition shown in Table N.41 is summarized below;

Farm Household Budget under With-Project Condition

(Unit: 1,000 VND)

Land Position	Higher Land	Middle Land	Lower Land
1. Income	12,660	10,000	10,310
Farm Income - Crop	5,980	5,380	3,850
- Livestock	2,590	1,550	3,050
Off-Farm Income	4,090	3,070	3,410
2. Expenditure	3,830	3,320	3,870
Production Cost	2,295	2,510	2,520
Living Expenses	1,530	1,530	1,530
3. Net Reserve & Other Expenses	8,830	5,970	6,260
Increment in Net Reserve & Other Expenses	2,210	880	560
	36.7%	19.3%	9.8%
Increase of Income from Crop Production (proportion to without-project condition)	3,370	2,140	730
	129%	66%	23%

Source: Feasibility Study on Binh Dinh Multipurpose Water Resources Project, April 2000.

After implementation of the project, income from crop production will increase by 23% to 129%, then, total income will increase by 8% to 36%. Finally, the balance between income and expenditure will expand 10% to 37%. This will substantially improve farm household economy, subsequently improve farmers' living standard.

This analysis is made based on the present land holding size and the current situation of other income of farm household. If the farm size expands in future, the project effect on farm income will be larger and bring more incentive to farmers for crop production. In this regard, leasing or rental system of land to expand farm size will create favorable situation for farm economy and project.

2.2.3 Procedure of Project Financing

Typical financing procedure of water resources development and management projects is presented hereunder based on information from Central Project Office (CPO), MARD.

(1) General Procedure until Loan Agreement

All the projects are classified into three levels based on the cost estimate of pre-feasibility study as shown below:

	Project Cost	Necessary Approval
Level A	More than VND400 billion	Provincial people's committee,
Level B	VND20 billion - VND400 billion	related ministry, and
Level C	Less than VND20 billion	government office

The proposed projects should be included in the development plan of the related province. After approval of the results of the pre-feasibility study, a feasibility study is carried out by local consultants and/or technical assistance of international agencies.

After pre-feasibility study or feasibility study, if the project is decided to be carried out by ODA loan, negotiation for loan will be conducted by the representatives from the State Bank, related ministries, Government Office, Ministry of Planning and Investment (MPI), Ministry of Finance, Presidential Office, and a donor agency. The results of negotiation are subject to approval of Prime Minister. If the results are approved by Prime Minister, a loan agreement is concluded between State Bank and the donor agency.

(2) Implementation, Operation and Maintenance of Projects

(A) Implementing Agencies

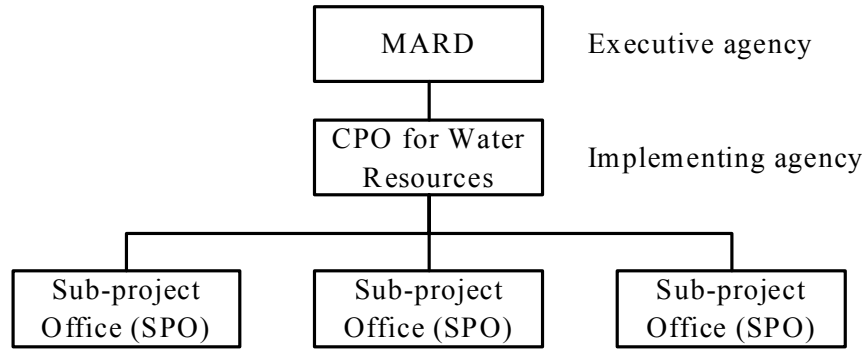
- Executive agency: Ministries (MARD)
- Implementing agencies: Central Project Office (CPO)

There are CPOs under MARD for the following three sectors:

- Water Resources
- Agriculture
- Forestry

Each CPO is further divided into Sub-project Offices (SPOs) or Provincial Project Management Board (PPMB) attached to provincial/regional administration.

Water resources development and management projects are usually implemented by the following organization:



Organization for Project Implementation

(B) Operation and Maintenance

At the completion of the project, the constructed facilities are transferred from SPO or PPMB to Irrigation Management Company (or Water Resources Management Company). The company is responsible for operation and maintenance of the facilities such as dam and irrigation.

Domestic and industrial water supply facilities in are operated and maintained by water supply companies, while hydropower station and appurtenant facilities are operated and maintained by a regional branch office of Vietnam Electricity Company.

(3) Project Cost Allocation

(A) Capital Cost

Project costs usually consist of the following items:

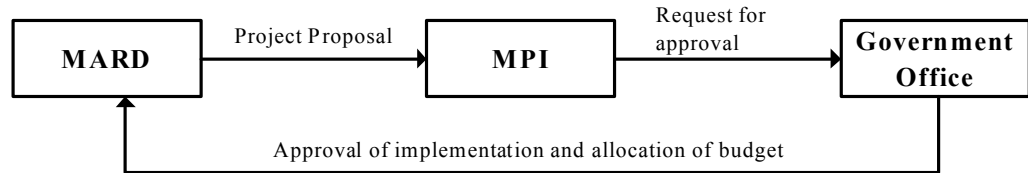
- A. Civil construction cost
- B. Equipment cost
- C. Other costs (normaly, 25%-30% of the total project cost)
 - a) Resettlement cost
 - b) Administration cost
 - c) Detaild design and construction supervision
- D. Price and Physical Contingency (normaly, 10% of the total project cost)

In case of ODA loan projects, the loan usually covers the following proportion of the project cost:

Coverage Rates of Loan

Cost Item	Loan Coverage
1. Construction cost	83% - 91%
2. Cost of equipment	
- Domestic procurement	75%
- Foreign procurement	100%
3. Resettlement cost and taxes	All covered by domestic funds

In the case of water resources development projects, project proposal including request for project budget are prepared by MARD and submitted to MPI. If the proposal is approved by MPI, it is subject to the Government Office for approval. After the approval of the Government Office, the project budget is allocated to MARD.



Procedure for Approval of Project Implementation

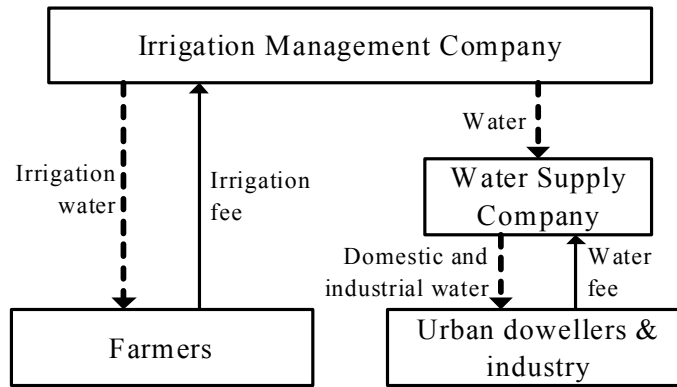
As for resettlement cost, basically the budget should be prepared by the provincial government. However, if the province can not afford to prepare the budget, State Government takes over the cost.

In the case of multipurpose dam project, the cost for domestic and industrial water supply facilities and hydropower facilities should be separated from dam and irrigation facilities. Such costs should be prepared separately by water supply company and electricity company, respectively.

(B) Operation and Maintenance Cost

Almost all operation and maintenance costs are borne by Irrigation Management Company. The company collect irrigation fee for operation and maintenance of the facilities from farmers. Minor repair works are also covered by the collected irrigation fee. However, if a serious damage occurs and/or relatively large rehabilitation or upgrading works are necessary , the cost is funded by the Provincial Government and/or State Government upon request of the company.

Water Supply Company operates and maintains water supply facilities by collected domestic and industrial water charge. The company does not necessary to pay any cost to Irrigation Management Company under the present system.



Flow of Water Supply and Water Fee

2.2.4 Operation and Maintenance of Water Management Facilities in Binh Dinh Province

Operation and maintenance of water management facilities in Binh Dinh Province are conducted by the following chain of responsibility:

Responsibility of O & M in Binh Dinh Province

Facilities related to water management	Institution
1. Dike along main rivers and tributaries	Flood Control and Dike Management Department, DARD
2. Domestic water supply	Urban area: Binh Dinh Water Supply Company Rural area: Cooperative
3. Hydropower station and appurtenant	Vietnam Electricity Company Branch Office No.3
4. Large reservoirs, irrigation weirs & canal	Irrigation Management Company

Other than responsibilities mentioned above, basically, all the regional cooperatives and farmers groups have a responsibility to maintain and repair dikes in the respective regions. However, when relatively large-scale rehabilitation is necessary, Flood Control and Dike Management Department of DARD is responsible for the rehabilitation works.

Currently, Irrigation Management Company of Binh Dinh Province is managing 6 large-scale reservoirs, which irrigate 6,500 ha of farmlands, 22 weirs for irrigation of 12,400ha, and 550km of irrigation canals. The company collects VND10,227 million as irrigation fee from the beneficial farmers in 2002. The amount is from the following crops:

Cultivation Area Managed by Irrigation Management Company

Crop	Area (ha)
Winter - Spring Paddy	19,323
Summer-Autumn Paddy	20,826
Winter Paddy	12,259

Cost composition of the Irrigation Management Company of Binh Dinh Province is as

summarized below:

Cost Distribution of Irrigation Management Company

Item	%
1. Salary for staff	22.42
2. O & M of dam	0.78
3. Electricity	0.78
4. Repair	22.88
- Canal O & M	(40%)
- Reservoir & weir O & M	(60%)
5. Management fee of 5 companies	9.38
6. Cost for training & technology	1.17
7. Other expenditure	35.69

The company is carrying out upgrading works of irrigation canals (concrete lining works) for improvement of irrigation efficiency by the Provincial funds of VND10 billion/year other than VND10 billion of the collected irrigation fee.

Moreover, the company is conducting upgrading works for six reservoirs by the state budget of VND15 - 30 billion/year but this budget is allocated only for this purposes and is not regular budget.

The irrigation charge is decided by the Provincial People's Committee and the tariff is revised every two years. The tariff is basically depending on the price of rice. The latest irrigation fee decided by the Provincial People's Committee in April 2001 is presented in Table N.42. Administrative structure of Binh Dinh Irrigation Management Company is shown in Figure N.4.

2.2.5 External Debt and Outstanding

Vietnam had been classified as a heavily indebted poor country by World Bank according to economic condition of income and indebtedness. At the end of 2000, the total external debt was US\$12.8 billion, equivalent to 40.8% of the gross national income. Out of this, US\$11.5 billion was the long-term debt and almost all of it is public and publicly guaranteed debt.

External Debt and Outstanding (Unit: US\$ million)

	1995	1996	1997	1998	1999	2000
Total external debt	25,427	26,257	21,780	22,502	23,260	12,787
Long-term debt	21,777	21,964	18,986	19,918	20,529	11,546
Total debt service	364	393	913	1,094	1,410	1,303
Principal	225	200	589	665	1,047	954
Interest	139	193	324	429	363	349
Gross national income (GNI)	19,819	22,997	27,609	27,184	28,682	31,344
Exports of goods & services	7,441	10,214	11,819	12,101	14,152	17,299
Ratios (%)						
Total external debt/GNI	128.3	114.2	78.9	82.8	81.1	40.8
Debt-service ratio	4.9	3.8	7.7	9.0	10.0	7.5

Source: Global Development Finance 2002, World Bank

Total debt service aggregated to US\$1.3 billion in 2000. After the write-offs and rescheduling of recent years, the debt-service ratio (DSR), a kind of country risk assessment factors, became 7.5%, which is already manageable level of indebtedness.

Table N.1 Results of Economic Analysis of Alternatives

(1/4)

Alternative	Feature of Alternative	EIRR	B/C	NPV (US\$ m)	W/S requirement
I.	Including La Tinh River Basin				
I-1	With Dam				
A	Without New Sea Dyke Spillway				
I-1.1A	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 36.5 GWh/year, - Flood control capacity of dam: 221.7 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	15.1%	1.52	90.1	Not satisfy
I-1.2A	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 42.0 GWh/year, - Flood control capacity of dam: 121.2 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.6%	1.46	80.2	Not satisfy
I-1.3A	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 37.8 GWh/year, - Flood control capacity of dam: 292.8 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	15.0%	1.51	91.9	Satisfy
I-1.4A	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 44.6 GWh/year, - Flood control capacity of dam: 192.8 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.7%	1.48	84.9	Satisfy
I-1.5A	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 37.2 GWh/year, - Flood control capacity of dam: 375.5 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	14.8%	1.50	91.3	Satisfy
I-1.6A	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 44.7 GWh/year, - Flood control capacity of dam: 275.5 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, and - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	14.6%	1.48	87.1	Satisfy
B	With New Sea Dyke Spillway				
I-1.1B	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 36.5 GWh/year, - Flood control capacity of dam: 221.7 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	15.2%	1.52	91.2	Not satisfy
I-1.2B	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 42.0 GWh/year, - Flood control capacity of dam: 121.2 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.7%	1.47	82.4	Not satisfy

Table N.1 Results of Economic Analysis of Alternatives

(2/4)

Alternative	Feature of Alternative	EIRR	B/C	NPV (US\$ m)	W/S requirement
I-1.3B	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 37.8 GWh/year, - Flood control capacity of dam: 292.8 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	15.1%	1.52	92.4	Satisfy
I-1.4B	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 44.6 GWh/year, - Flood control capacity of dam: 192.8 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.8%	1.48	86.3	Satisfy
I-1.5B	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 37.2 GWh/year, - Flood control capacity of dam: 375.5 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	14.9%	1.50	91.7	Satisfy
I-1.6B	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 44.7 GWh/year, - Flood control capacity of dam: 275.5 MCM, - Irrigation: 54,500 ha with livestock, aquaculture, and - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	14.7%	1.48	88.0	Satisfy
I-2	Without Dam				
I-2	- Domestic and industrial water supply: 448,000m ³ /day (2020) and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood.	Negative	0.11	-1,114.7	Satisfy for domestic & industrial water supply
II.	Excluding La Tinh River Basin				
II-1	With Dam				
A	Without New Sea Dyke Spillway				
II-1.1A	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 36.5 GWh/year, - Flood control capacity of dam: 221.7 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	14.9%	1.50	83.6	Not satisfy
II-1.2A	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 42.0 GWh/year, - Flood control capacity of dam: 121.2 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.4%	1.44	73.7	Not satisfy
II-1.3A	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 37.8 GWh/year, - Flood control capacity of dam: 292.8 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	14.8%	1.49	85.4	Satisfy

Table N.1 Results of Economic Analysis of Alternatives

(3/4)

Alternative	Feature of Alternative	EIRR	B/C	NPV (US\$ m)	W/S requirement
II-1.4A	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 44.6 GWh/year, - Flood control capacity of dam: 192.8 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.5%	1.45	78.4	Satisfy
II-1.5A	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 37.2 GWh/year, - Flood control capacity of dam: 375.5 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	14.6%	1.48	84.8	Satisfy
II-1.6A	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 44.7 GWh/year, - Flood control capacity of dam: 275.5 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, and - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	14.4%	1.45	80.7	Satisfy
B	With New Sea Dyke Spillway				
II-1.1B	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 36.5 GWh/year, - Flood control capacity of dam: 221.7 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	15.0%	1.50	84.8	Not satisfy
II-1.2B	- Effective storage of dam: 209.9 MCM, - Hydropower generation: 42.0 GWh/year, - Flood control capacity of dam: 121.2 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.5%	1.45	75.9	Not satisfy
II-1.3B	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 37.8 GWh/year, - Flood control capacity of dam: 292.8 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	14.9%	1.50	85.9	Satisfy
II-1.4B	- Effective storage of dam: 279.5 MCM, - Hydropower generation: 44.6 GWh/year, - Flood control capacity of dam: 192.8 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood even with flood control effect of dam	14.6%	1.46	79.8	Satisfy
II-1.5B	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 37.2 GWh/year, - Flood control capacity of dam: 375.5 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, - Domestic and industrial water supply: 448,000m3/day (2020), and - River improvement to discharge 5% late flood safely and to keep safety of dike up to 10 % major flood by side overflow spillway in combination with flood control effect of the dam.	14.7%	1.48	85.2	Satisfy

Table N.1 Results of Economic Analysis of Alternatives

(4/4)

Alternative	Feature of Alternative	EIRR	B/C	NPV (US\$ m)	W/S requirement
II-1.6B	- Effective storage of dam: 360.2 MCM, - Hydropower generation: 44.7 GWh/year, - Flood control capacity of dam: 275.5 MCM, - Irrigation: 48,200 ha with livestock, aquaculture, and - Domestic and industrial water supply: 448,000m ³ /day (2020), and - River improvement to discharge 5% late flood safely, but can not keep safety of dike up to 10 % major flood even with flood control effect of dam.	14.5%	1.46	81.5	Satisfy
II-2	Without Dam				
II-2	- Domestic and industrial water supply: 448,000m ³ /day (2020) and - River improvement with side overflow spillway, but safety level is lower than 5% late flood and can not keep safety of dike up to 10 % major flood.	Negative	0.11	-1,114.7	Satisfy for domestic & industrial water supply

Note: Applied discount rate for calculation of B/C ratio and NPV: 10%
NPV: Net Present Value

Table N.2 Economic Farmgate Price of Products and Inputs (1/3)

Commodity and Operation	Unit	Price per Unit	Remarks
(*1)			
I. Paddy/Rice (Export Parity)			
1. CIF Bangkok	ton	\$164.8	White rice (Thai), 5% broken, milled.
2. Quality adjustment	ton	\$156.6	Adjusted to 95% of CIF Bangkok (*2).
3. Freight and insurance	- ton	\$20.0	
4. FOB Da Nang	ton	\$136.6	
Expressed in VND		ton	Exchange rate: US\$1.0 = VND15,068
5. Transport & handling	- ton	D193,200	Between Qui Nhon and Da Nang (300 km)
6. Ex-mill price at Binh Dinh	ton	D1,865,100	
7. Conversion to paddy	ton	D1,212,300	Recovery rate: 65%.
8. Value of by-product	+ ton	D576,000	Rice husk & bran for animal feed, equivalent to maize.
9. Milling Charges	- ton	D24,200	2% of paddy value at ex-mill price (item 7).
10. Mill gate price	ton	D1,764,100	
10. Transport to rice mill	- ton	D14,000	Transport cost within the area (20 km).
11. Economic farm gate price	ton	D1,750,100	
Expressed per kg	kg	D1,750	
II. Maize (Import Parity)			
1. FOB US Gulf ports	ton	\$79.3	No.2, yellow.
2. Quality adjustment	ton	\$51.5	Ajusted to 65% of FOB US (*3).
3. Freight and insurance	+ ton	\$43.0	
4. CIF Da Nang	ton	\$94.5	
Expressed in VND		ton	Exchange rate: US\$1.0 = VND15,068
5. Transport & handling cost	+ ton	D193,200	Between Qui Nhon and Da Nang (300 km)
6. Wholesale price	ton	D1,617,100	at Qui Nhon
7. Inland transportation	- ton	D14,000	Transport cost within the area (20 km).
8. Economic farm gate price	ton	D1,603,100	
Expressed per kg	kg	D1,600	Competition with imported animal feed.
III. Groundnuts (Export Parity)			
1. CIF North Europe	ton	\$534.0	Groundnuts oil, Rotterdam.
2. Quality Adjustment	ton	\$507.3	Ajusted to 95% of FOB North Europe (*4).
3. Freight and insurance	- ton	\$45.0	
4. FOB Da Nang	ton	\$462.3	
Expressed in VND		ton	Exchange rate: US\$1.0 = VND15,068
5. Handling cost	- ton	D58,200	at Da Nang
6. Ex-mill price at Ho Chi Minh	ton	D6,907,700	
7. Equivalent to groundnuts	ton	D2,763,100	Recovery rate: 40%.
8. Processing cost	- ton	D138,200	5% of raw nuts value at ex-mill price (item 5).
9. Value of by-product (feed)	+ ton	D665,300	Meal for anima feed, maize equivalent.
10. Mill gate price	ton	D3,290,200	at Da Nang
11. Inland transport	- ton	D193,200	Between Site and Da Nang (300 km)
12. Economic farm gate price	ton	D3,097,000	
Expressed per kg	kg	D3,100	

Note: *1: International market price in 2015 deflated to 2001 constant price by the manufacturing unit value, quoted from the Appendix 2: Grobal Commodity Price Prospects of "Global Economic Prospects and the Developing Countries, 2002".

*2: Adjustment estimated based on the past export record of Vietnam, taking into account the price differences among 5%, 25% & 35% in Bangkok market.

*3: Ajustment estimated based on import substitution for animal feed.

*4: Ajustment assumed groundnut oil export quality.

Table N.2 Economic Farmgate Price of Products and Inputs (2/3)

Commodity and Operation	Unit	Price per Unit	Remarks
(*1)			
IV. Soybeans (Import Parity)			
1. FOB North Europe	ton	\$164.8	based on CIF at Rotterdam from US
2. Quality Adjustment	ton	\$164.8	No adjustment applied
3. Freight and insurance	+ ton	\$45.0	
4. FOB Ho Chi Minh	ton	\$209.8	
Expressed in VND	ton	D3,161,300	Exchange rate: VND15,068 per \$1.0
5. Transport & handling	+ ton	D386,700	Between Qui Nhon and Ho Chi Minh (730 km)
6. Wholesale price	ton	D3,548,000	at Qui Nhon
7. Inland transport	- ton	D13,200	Between site and Qui Nhon (20 km)
8. Economic farm gate price	ton	D3,534,800	
Expressed per kg	kg	D3,530	
V. Tobacco (Export Parity)			
1. CIF North Europe	ton	\$2,105.2	
2. Quality Adjustment	ton	\$1,999.9	Ajusted to 95% of FOB North Europe
3. Freight and insurance	- ton	\$45.0	
4. FOB Ho Chi Minh	ton	\$1,954.9	
Expressed in VND	ton	D29,456,400	Exchange rate: VND15,068 per \$1.0
5. Handling cost	- ton	D58,200	at Saigon Port
6. Inland transportation	- ton	D132,000	Dong Nai to Ho Chi Minh (200 km)
7. Ex-factory price at Dong Nai	ton	D29,266,200	
Conversion to material	ton	D8,779,900	Raw tobacco leaf recovery: 21%
8. Processing cost	- ton	D2,791,100	
9. Factory gate price	ton	D5,988,800	
10. Inland transportation	- ton	D231,000	Site to Dong Nai factory (350 km)
11. Economic farm gate price	ton	D5,757,800	Price after preparation and curing
Expressed per kg	kg	D5,760	
VI. Sugarcane (Import Parity)			
1. FOB North Europe	ton	\$160.0	
2. Quality Adjustment	+ ton	\$140.0	Ajusted to 85% of FOB North Europe
3. Freight and insurance	+ ton	\$45.0	
4. CIF Da Nang	ton	\$185.0	
Expressed in VND	ton	D2,788,000	Exchange rate: VND15,068 per \$1.0
5. Handling cost	+ ton	D58,200	at Da Nang Port
6. Inland Transportation	+ ton	D148,500	Between Qui Nhon and Da Nang (330 km)
7. Wholesale Price		D2,994,700	at Qui Nhon
8. Inland Transportation	- ton	D19,800	Between Qui Nhon and Tay Son (30 km)
9. Ex-mill factory price	ton	D2,974,900	as sugar at Tay Son.
Value as sugarcane		D252,900	Recovery of sugar from sugarcane: 8.5%
10. Processing Cost	- ton	D35,400	
11. By-product (molasses 5.2%)	+ ton	D0	Molasses, baggase, filtered mud, etc.
12. Mill gate price	ton	D217,500	
13. Transport from farm to mill	- ton	D10,900	
14. Economic farm gate price	ton	D206,600	
Expressed per kg	kg	D210	

Note: *1: International market price in 2015 deflated to 2001 constant price by the manufacturing unit value, quoted from the Appendix 2: Global Commodity Price Prospects of "Global Economic Prospects and the Developing Countries, 2002".

*: Inland transportation cost VND450 / ton km for short distance, and VND660 / ton km for long distance.

Table N.2 Economic Farmgate Price of Products and Inputs (3/3)

Commodity and Operation	Unit	Price per Unit	Remarks
(*1)			
VII. DAP: diammonium phosphate (Import Parity)			
FOB US Gulf	ton	\$121.7	Bulk, spot.
Freight and insurance	+ ton	\$43.0	
CIF Da Nang	ton	\$164.7	
Expressed in VND	ton	D2,481,700	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,674,900	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,688,900	
Expressed per kg	kg	D2,690	
Effective content N	kg	D12,810	Total N: 21%, total P2O5: 53%.
Effective content P ₂ O ₅	kg	D5,080	
VIII. Potassium Chloride (Import Parity)			
FOB North America	ton	\$79.3	Standard grade, spot, Vancouver
Freight and insurance	+ ton	\$43.0	
CIF Da Nang	ton	\$122.3	
Expressed in VND	ton	D1,842,800	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,036,000	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,050,000	
Expressed per kg	kg	D2,050	
Effective content	kg	D3,730	Total K ₂ O: 55% on average (48% to 62%).
IX. TSP: triple super-phosphate (Import Parity)			
FOB US Gulf	ton	\$100.7	Bulk, spot.
Freight and insurance	+ ton	\$43.0	
CIF Da Nang	ton	\$143.7	
Expressed in VND	ton	D2,165,300	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,358,500	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,372,500	
Expressed per kg	kg	D2,370	
As effective content	kg	D5,150	Total P ₂ O ₅ : 46% on average (43% to 49%).
X. Urea (Import Parity)			
FOB Eastern Europe	ton	\$91.5	Bulk or bagged, spot.
Freight and insurance	+ ton	\$45.0	
CIF Da Nang	ton	\$136.5	
Expressed in VND	ton	D2,056,800	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,250,000	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,264,000	
Expressed per kg	kg	D2,260	
Effective content	kg	D5,380	Total N: 42%.

Note: *1: International market price in 2015 deflated to the 2001 constant price by the manufacturing unit value, quoted from the Appendix 2: Global Commodity Price Prospects of "Global Economic Prospects and the Developing Countries, 2002".

Table N.3 List of Financial and Economic Price of Products and Inputs

	Unit	Financial *1	Economic *2	Remarks
1. Agricultural Products				
1.1 Paddy	VND/kg	1,500 - 1,800	1,750	*3: Export parity
1.2 Maize	VND/kg	1,330	1,600	*3: Import parity
1.3 Groundnuts	VND/kg	4,260	3,100	*3: Export parity
1.4 Soybeans	VND/kg	4,150	3,530	*3: Import parity
1.5 Tobacco	VND/kg	7,000 - 9,000	5,760	*3: Export parity
1.6 Sugarcane *6	VND/kg	200 - 220	210	*3: Import parity
1.7 Cassava	VND/kg	230	207	*4
1.8 Pineapple	VND/kg	750	675	*4
2. Agricultural Inputs				
2.1 Farm Mannure	VND/kg	70	63	*4
2.2 Nitrogen Fertilizer	VND/kg	2,200	2,260	*4
2.3 Phosphorus Fertilizer	VND/kg	3,000	2,690	*4
2.4 Potassium Fertilizer	VND/kg	2,200	2,050	*4
DAP	VND/kg	-	2,690	*3: Import parity
DAP (N value)	VND/kg	-	12,810	*3: Import parity
DAP (P ₂ O ₅)	VND/kg	-	5,080	*3: Import parity
Potassium Chloride	VND/kg	-	2,050	*3: Import parity
Potassium Chloride (K ₂ O)	VND/kg	-	3,730	*3: Import parity
TSP	VND/kg	-	2,370	*3: Import parity
TSP (P ₂ O ₅)	VND/kg	-	5,150	*3: Import parity
Urea	VND/kg	2,200	2,260	*3: Import parity
Urea (N)	VND/kg	-	5,380	*3: Import parity
Lime	VND/kg	500	450	*4
2.5 Agro-chemicals	VND/lit.	40,000	36,000	*4
2.6 Seed & Planting Material				
- Paddy	VND/kg	2,000	1,800	*4
- Maize	VND/kg	2,500	2,300	*4
- Groundnuts	VND/kg	2,300	2,100	*4
- Soybeans	VND/kg	2,400	2,200	*4
- Tobacco	VND/kg	3,500	3,200	*4
- Sugarcane	VND/plant	500	450	*4
- Cassava	VND/plant	-	50	*4
- Pineapple	VND/plant	300	270	*4
3. Farming Operation				
3.1 Farm Labour (hired)	VND/day	15,000	13,500	*4
3.2 Machinery for Land Prepar	VND/hr.	16,700	15,000	*4

Remarks *1: Price ranges expressed at current price in early 2003.

*2: Expressed at constant 2001 prices.

*3: Economic prices at 2001 constant price are projected based on the international price forecast in 2015.

*4: Modification of the previous studies based on the field interviews

*5: Economic prices are obtained using the standard conversion factor (0.9).

*6: Average farm gate prices of the sugar mill factory at Tay Son and farm interviews.

Table N.4 Economic Crop Budget under Without-Project (1/2)

	Unit	Irrigated Winter-Spring Paddy			Irrigated Summer-Autumn Paddy			Irrigated 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,750	4,300	7,525,000	1,750	3,900	6,825,000	1,750	3,400	5,950,000
2. Production Cost				3,618,000			3,417,900			3,216,600
2.1 Labour	man day	13,500	100	1,350,000	13,500	100	1,350,000	13,500	100	1,350,000
2.2 Input				1,395,700			1,245,100			1,103,400
- Seed	kg	1,800	150	270,000	1,800	150	270,000	1,800	140	252,000
- Manure	kg	63	600	37,800	63	500	31,500	63	400	25,200
- Nitrogen	kg	2,260	170	384,200	2,260	160	361,600	2,260	150	339,000
- Phosphate	kg	2,690	130	349,700	2,690	100	269,000	2,690	80	215,200
- Potassium	kg	2,050	120	246,000	2,050	100	205,000	2,050	80	164,000
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	3	108,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	18	270,000	15,000	18	270,000
2.4 Irrigation	6%			451,500			409,500			357,000
2.5 Others	5%			150,800			143,300			136,200
3. Net Income				3,907,000			3,407,100			2,733,400

	Unit	Irrigated Maize			Irrigated Groundnuts			Irrigated Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,600	3,300	5,280,000	3,100	1,500	4,650,000	3,530	1,200	4,236,000
2. Production Cost				2,528,078			2,401,130			2,559,030
2.1 Labour	man day	13,500	70	945,000	13,500	70	945,000	13,500	80	1,080,000
2.2 Input				1,010,978			926,030			965,030
- Seed	kg	2,000	160	320,000	2,100	170	357,000	2,200	180	396,000
- Manure	kg	63	6	378	63	10	630	63	10	630
- Nitrogen	kg	2,260	140	316,400	2,260	70	158,200	2,260	70	158,200
- Phosphate	kg	2,690	80	215,200	2,690	80	215,200	2,690	80	215,200
- Potassium	kg	2,050	60	123,000	2,050	60	123,000	2,050	60	123,000
- Chemicals	lit	36,000	1	36,000	36,000	2	72,000	36,000	2	72,000
2.3 Machinery	hrs	15,000	10	150,000	15,000	10	150,000	15,000	10	150,000
2.4 Irrigation	6%			316,800			279,000			254,200
2.5 Others	5%			105,300			101,100			109,800
3. Net Income				2,751,922			2,248,870			1,676,970

	Unit	Irrigated Tobacco			Irrigated Sugarcane (average annual cost)			Price VDN	Q'ty	Amount VDN/ha
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha			
1. Gross Income	kg	5,760	1,510	8,697,600	210	49,700	10,437,000	-	-	-
2. Production Cost				5,814,230			7,136,430			
2.1 Labour	man day	13,500	250	3,375,000	13,500	220	2,970,000	-	-	-
2.2 Input				1,395,330			2,960,230			-
- Seed	kg	3,200	180	576,000	450	5,000	2,250,000	-	-	-
- Manure	kg	63	10	630	63	10	630	-	-	-
- Nitrogen	kg	2,260	180	406,800	2,260	120	271,200	-	-	-
- Phosphate	kg	2,690	10	26,900	2,690	60	161,400	-	-	-
- Potassium	kg	2,050	100	205,000	2,050	100	205,000	-	-	-
- Chemicals	lit	36,000	5	180,000	36,000	2	72,000	-	-	-
2.3 Machinery	hrs	15,000	18	270,000	15,000	18	270,000	-	-	-
2.4 Irrigation	6%			521,900			626,200			-
2.5 Others	5%			252,000			310,000			-
3. Net Income				2,883,370			3,300,570			-

Table N.4 Economic Crop Budget under Without-Project (2/2)

	Unit	Rainfed Winter-Spring Paddy			Rainfed Summer-Autumn Paddy			Rainfed 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,750	2,900	5,075,000	1,750	2,600	4,550,000	1,750	2,200	3,850,000
2. Production Cost				2,563,500			2,454,800			2,123,800
2.1 Labour	man day	13,500	85	1,147,500	13,500	80	1,080,000	13,500	75	1,012,500
2.2 Input				1,023,900			987,900			740,200
- Seed	kg	1,800	130	234,000	1,800	130	234,000	1,800	100	180,000
- Manure	kg	63	500	31,500	63	500	31,500	63	400	25,200
- Nitrogen	kg	2,260	120	271,200	2,260	120	271,200	2,260	100	226,000
- Phosphate	kg	2,690	80	215,200	2,690	80	215,200	2,690	50	134,500
- Potassium	kg	2,050	80	164,000	2,050	80	164,000	2,050	50	102,500
- Chemicals	lit	36,000	3	108,000	36,000	2	72,000	36,000	2	72,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	18	270,000	15,000	18	270,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			122,100			116,900			101,100
3. Net Income				2,511,500			2,095,200			1,726,200

	Unit	Rainfed Maize			Rainfed Groundnuts			Rainfed Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,600	1,400	2,240,000	3,100	900	2,790,000	3,530	700	2,471,000
2. Production Cost				1,400,315			1,574,252			1,819,078
2.1 Labour	man day	13,500	40	540,000	13,500	50	675,000	13,500	65	877,500
2.2 Input				643,615			674,252			704,978
- Seed	kg	2,000	140	280,000	2,100	120	252,000	2,200	150	330,000
- Manure	kg	63	5	315	63	4	252	63	6	378
- Nitrogen	kg	2,260	70	158,200	2,260	50	113,000	2,260	50	113,000
- Phosphate	kg	2,690	40	107,600	2,690	50	134,500	2,690	40	107,600
- Potassium	kg	2,050	30	61,500	2,050	50	102,500	2,050	40	82,000
- Chemicals	lit	36,000	1	36,000	36,000	2	72,000	36,000	2	72,000
2.3 Machinery	hrs	15,000	10	150,000	15,000	10	150,000	15,000	10	150,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			66,700			75,000			86,600
3. Net Income				839,685			1,215,748			651,922

	Unit	Rainfed Tobacco			Irrigated Sugarcane (average annual cost)			Rainfed Cassava		
		Price (VDN)	Q'ty	Amount (VDN/ha)	Price (VDN)	Q'ty	Amount (VDN/ha)	Price (VDN)	Q'ty	Amount (VDN/ha)
1. Gross Income	kg	5,760	980	5,644,800	210	34,070	7,154,700	207	6,500	1,345,500
2. Production Cost				3,869,404			5,446,530			1,137,430
2.1 Labour	man day	13,500	180	2,430,000	13,500	170	2,295,000	15,000	35	525,000
2.2 Input				1,030,104			2,622,130			483,230
- Seed	kg	3,200	150	480,000	450	4,500	2,025,000	50	7,500	375,000
- Manure	kg	63	8	504	63	10	630	63	10	630
- Nitrogen	kg	2,260	120	271,200	2,260	100	226,000	2,260	0	0
- Phosphate	kg	2,690	10	26,900	2,690	50	134,500	2,690	40	107,600
- Potassium	kg	2,050	70	143,500	2,050	80	164,000	2,050	0	0
- Chemicals	lit	36,000	3	108,000	36,000	2	72,000	36,000	0	0
2.3 Machinery	hrs	15,000	15	225,000	15,000	18	270,000	15,000	5	75,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			184,300			259,400			54,200
3. Net Income				1,775,396			1,708,170			208,070

Table N.5 Economic Crop Budget under With-Project

	Unit	Irrigated Winter-Spring Paddy			Irrigated Summer-Autumn Paddy			Irrigated 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,750	5,000	8,750,000	1,750	4,700	8,225,000	1,750	4,300	7,525,000
2. Production Cost				3,721,800			3,640,600			3,540,000
2.1 Labour	man day	13,500	100	1,350,000	13,500	100	1,350,000	13,500	100	1,350,000
2.2 Input				1,424,600			1,377,200			1,321,400
- Seed	kg	1,800	150	270,000	1,800	150	270,000	1,800	150	270,000
- Manure	kg	63	700	44,100	63	700	44,100	63	600	37,800
- Nitrogen	kg	2,260	180	406,800	2,260	180	406,800	2,260	170	384,200
- Phosphate	kg	2,690	130	349,700	2,690	120	322,800	2,690	110	295,900
- Potassium	kg	2,050	120	246,000	2,050	110	225,500	2,050	110	225,500
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	3	108,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	18	270,000	15,000	18	270,000
2.4 Irrigation	6%			525,000			493,500			451,500
2.5 Others	5%			152,200			149,900			147,100
3. Net Income				5,028,200			4,584,400			3,985,000

	Unit	Irrigated Maize			Irrigated Groundnuts			Irrigated Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,600	4,500	7,200,000	3,100	2,000	6,200,000	3,530	1,800	6,354,000
2. Production Cost				2,856,678			2,563,141			2,755,330
2.1 Labour	man day	13,500	70	945,000	13,500	70	945,000	13,500	80	1,080,000
2.2 Input				1,184,178			961,841			1,001,030
- Seed	kg	2,000	160	320,000	2,100	170	357,000	2,200	180	396,000
- Manure	kg	63	6	378	63	7	441	63	10	630
- Nitrogen	kg	2,260	140	316,400	2,260	70	158,200	2,260	70	158,200
- Phosphate	kg	2,690	110	295,900	2,690	80	215,200	2,690	80	215,200
- Potassium	kg	2,050	70	143,500	2,050	60	123,000	2,050	60	123,000
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	3	108,000
2.3 Machinery	hrs	15,000	12	180,000	15,000	12	180,000	15,000	12	180,000
2.4 Irrigation	6%			432,000			372,000			381,200
2.5 Others	5%			115,500			104,300			113,100
3. Net Income				4,343,322			3,636,859			3,598,670

	Unit	Irrigated Tobacco			Irrigated Sugarcane (average annual cost)			Irrigated Pineapple (average annual cost)		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	5,760	1,700	9,792,000	210	60,000	12,600,000	675	20,000	13,500,000
2. Production Cost				5,879,830			7,611,393			7,322,900
2.1 Labour	man day	13,500	250	3,375,000	13,500	230	3,105,000	13,500	260	3,510,000
2.2 Input				1,395,330			3,138,993			3,280,600
- Seed	kg	3,200	180	576,000	450	5,000	2,250,000	50	26,000	1,300,000
- Manure	kg	63	10	630	63	11	693	63	0	0
- Nitrogen	kg	2,260	180	406,800	2,260	190	429,400	2,260	260	587,600
- Phosphate	kg	2,690	10	26,900	2,690	60	161,400	2,690	125	336,250
- Potassium	kg	2,050	100	205,000	2,050	110	225,500	2,050	375	768,750
- Chemicals	lit	36,000	5	180,000	36,000	2	72,000	36,000	8	288,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	19	285,000	15,000	10	150,000
2.4 Irrigation	6%			587,500			756,000			35,300
2.5 Others	5%			252,000			326,400			347,000
3. Net Income				3,912,170			4,988,607			6,177,100

Table N.6 Summary of Economic Crop Budget

Crops	Without Project					With Project					Increment		
	Unit Yield	Gross income	Production Cost	Net Income		Unit Yield	Gross income	Production Cost	Net Income		Unit Yield	Net Income	
	ton/ha	VND/ha	VND/ha	VND/ha	US\$/ha	ton/ha	VND/ha	VND/ha	VND/ha	US\$/ha	ton/ha	VND/ha	US\$/ha
Irrigated Crops													
1. Paddy (winter-spring)	4.30	7,525,000	3,618,000	3,907,000	259.3	5.00	8,750,000	3,721,800	5,028,200	333.7	0.70	1,121,200	74.4
2. Paddy (summer-autumn)	3.90	6,825,000	3,417,900	3,407,100	226.1	4.70	8,225,000	3,640,600	4,584,400	304.2	0.80	1,177,300	78.1
3. Paddy (3rd crop)	3.40	5,950,000	3,216,600	2,733,400	181.4	4.30	7,525,000	3,540,000	3,985,000	264.5	0.90	1,251,600	83.1
4. Maize	3.30	5,280,000	2,528,100	2,751,900	182.6	4.50	7,200,000	2,856,700	4,343,300	288.2	1.20	1,591,400	105.6
5. Groundnuts	1.50	4,650,000	2,401,100	2,248,900	149.3	2.00	6,200,000	2,563,100	3,636,900	241.4	0.50	1,388,000	92.1
6. Soybeans	1.20	4,236,000	2,559,000	1,677,000	111.3	1.80	6,354,000	2,755,300	3,598,700	238.8	0.60	1,921,700	127.5
7. Tobacco	1.51	8,697,600	5,814,200	2,883,400	191.4	1.70	9,792,000	5,879,800	3,912,200	259.6	0.19	1,028,800	68.3
8. Sugarcane	49.70	10,437,000	7,136,400	3,300,600	219.0	60.00	12,600,000	7,611,400	4,988,600	331.1	10.30	1,688,000	112.0
9. Pineapple	20.00	13,500,000	7,322,900	6,177,100	409.9	20.00	13,500,000	7,322,900	6,177,100	409.9	0.00	0	0.0
Rainfed Crops													
1. Paddy (winter-spring)	2.90	5,075,000	2,563,500	2,511,500	166.7						2.1	2,516,700	167.0
2. Paddy (summer-autumn)	2.60	4,550,000	2,454,800	2,095,200	139.0						2.1	2,489,200	165.2
3. Paddy (3rd crop)	2.20	3,850,000	2,123,800	1,726,200	114.6						2.1	2,258,800	149.9
4. Maize	1.40	2,240,000	1,400,300	839,700	55.7						3.1	3,503,600	232.5
5. Groundnuts	0.90	2,790,000	1,574,300	1,215,700	80.7						1.1	2,421,200	160.7
6. Soybeans	0.70	2,471,000	1,819,100	651,900	43.3						1.1	2,946,800	195.6
7. Tobacco	0.98	5,644,800	3,869,400	1,775,400	117.8						0.7	2,136,800	141.8
8. Sugarcane	34.07	7,154,700	5,446,500	1,708,200	113.4						25.9	3,280,400	217.7
9. Cassava	6.50	1,345,500	1,137,400	208,100	13.8						-6.5	-208,100	-13.8

Note: Exchange Rate: US\$1.00 = VND15,068

Table N.7 Incremental Benefit for M/P

	Without-Project			Year 2020 with-Project			Increment Benefit 10 ³ US\$
	Area	Net Income	Total	Area	Net Income	Total	
	ha	US\$/ha	10 ³ US\$	ha	US\$/ha	10 ³ US\$	
Irrigated Area	24,400			54,500			
1. Paddy (Winter-Spring)	24,400	259	6,327	40,700	334	13,582	-
2. Paddy (Summer-Autum)	19,800	226	4,477	27,700	304	8,428	-
3. Paddy (3rd Crop)	8,600	181	1,560	21,600	264	5,713	-
4. Maize	1,000	183	183	18,200	288	5,246	-
5. Groundnuts/ Soybeans	1,900	130	248	9,900	241	2,390	-
6. Tobacco	0	191	0	700	260	182	-
7. Sugarcane	0	219	0	5,600	331	1,854	-
8. Pineapple	0	410	0	300	410	123	-
	55,700	520	12,795	124,700	690	37,518	24,723
Rainfed Area	30,100			0			
1. Paddy (Winter-Spring)	12,200	167	2,033	-	-	-	-
2. Paddy (Summer-Autum)	-	139	0	-	-	-	-
3. Paddy (3rd Crop)	-	115	0	-	-	-	-
4. Maize	9,900	56	552	-	-	-	-
5. Groundnuts/ Soybeans	5,500	62	341	-	-	-	-
6. Tobacco	400	118	47	-	-	-	-
7. Sugarcane	5,700	113	646	-	-	-	-
8. Cassava	6,300	14	87	-	-	-	-
	40,000	120	3,706	0			-3,706
Net Total Area	54,500			54,500			
Total	95,700		16,501	124,700		37,518	21,017
	(net production value \$ per ha)		\$302.8			\$688.4	\$385.6

	Without			Year 2010 with Project			Increment Benefit 10 ³ US\$
	Area	Net Income	Total	Area	Net Income	Total	
	ha	US\$/ha	10 ³ US\$	ha	US\$/ha	10 ³ US\$	
Irrigated Area	24,400			32,800			
1. Paddy	24,400	259	6,330	24,840	334	8,290	
2. Paddy (Summer-Autum)	19,800	226	4,480	14,550	304	4,430	
3. Paddy (3rd Crop)	8,600	181	1,560	19,170	264	5,070	
4. Maize	1,000	183	180	9,100	288	2,620	
5. Groundnuts/ Soybeans	1,900	130	250	11,860	241	2,860	
6. Tobacco	0	191	0	260	260	70	
7. Sugarcane	0	219	0	260	331	90	
8. Pineapple	0	410	0	1,940	410	800	
	55,700	520	12,800	81,980	740	24,230	11,430
Rainfed Area	8,400						
1. Paddy (Winter-Spring)	3,400	167	570	0	167	0	
2. Maize	2,760	56	150	0	56	0	
3. Groundnuts/ Soybeans	1,530	62	90	0	62	0	
4. Tobacco	110	118	10	0	118	0	
5. Sugarcane	1,590	113	180	0	113	0	
6. Cassava	1,760	14	20	0	14	0	
	11,150	120	1,020	0		0	-1,020
Net Total Area	32,800			32,800			
Total	66,850		13,820	81,980		24,230	10,410
	(net production value \$ per ha)		\$421.3			\$738.7	\$317.4

Table N.8 Estimation of Livestock Benefit

	Unit	*4 2001	*5 2005	*5 2010	2020
I. Cattle, Buffalo, Pig and Goat					
1. Buffalo & Cattle					
Province	head	213,200	270,000	320,000	409,000
Proportion in the Project Area	*1	9%	10%	10%	10%
Project Area	*1 head	19,600	27,000	32,000	40,900
2. Pig					
Province	head	545,200	500,000	600,000	780,000
Proportion in the Project Area	*1	13%	15%	15%	15%
Project Area	*1 head	71,000	75,000	90,000	117,000
Cattle Equivalent	*2 head	17,000	18,000	21,600	28,100
3. Goat					
Province	head	13,300	7,500	10,000	17,000
Proportion in the Project Area	*1	7%	15%	15%	15%
Project Area	*1 head	970	1,100	1,500	2,600
Cattle Equivalent	*2 head	100	100	100	200
4. Total Cattle Equivalent					
Province	head	345,200	390,700	464,900	597,700
Project Area	*1 head	36,700	45,100	53,700	69,200
5. Production Value	*1				
Domestic	milli. VND	247,085	-	-	-
Other	milli. VND	4,528	-	-	-
Non-Meat	milli. VND	81,409	-	-	-
Other Products	milli. VND	25,163	-	-	-
Total	milli. VND	358,185	-	-	-
6. Unit Value per head	VND	1,038,000	1,038,000	1,038,000	1,038,000
7. Gross Production Value by Project	milli. VND	38,100	46,800	55,700	71,800
8. Production Cost	*3 milli. VND	31,600	38,800	46,200	59,600
9. Net Production Value	milli. VND	6,500	8,000	9,500	12,200
II. Poultry					
1. Whole Province	head	3,520,000	7,500,000	10,000,000	15,000,000
2. Proportion in the Project Area		13%	15%	15%	15%
3. Project Area	head	458,000	1,125,000	1,500,000	2,250,000
4. Production Value	milli. VND	33,400			
5. Unit Value per head	VND	9,500	9,500	9,500	9,500
6. Gross Production Value by Project	milli. VND	4,400	10,700	14,300	21,400
7. Production Cost	*3 milli. VND	3,700	9,100	12,200	18,200
8. Net Production Value	milli. VND	700	1,600	2,100	3,200
III. Incremental Benefit					
1. Total Net Production Value	milli. VND	7,200	9,600	11,600	15,400
2. Incremental Net Value	milli. VND	-	2,400	4,400	8,200
Expressed in US\$	US\$	-	159,000	292,000	544,000
3. Economic Value (90%)	US\$	-	143,000	263,000	490,000

Note *1: Water supply for livestock covering only 2 districts of Qui Nyon & Tuy Phouc.
*2: Conversion on weight basis, 150 kg for pig, 500 kg for cattle, and 45 kg for goat weight.
*3: Production cost assumed to be 83% for cattle and 85% for poultry.
*4: Number of head in 2001 by Statistical Yearbook 2001, Binh Dinh Province
*5: Number of heads in 2005 and 2010 quoted from Development Plan of Province.

Table N.9 Estimation of Aquaculture Benefit

	Unit	1995	1999	2000	2001	2005	2010	2020
I. Area under Shrimp Aquaculture								
1. Shrimp Aquaculture Area in the Whole Province	*1	ha	1,424	2,002	2,443	2,609	-	-
2. Shrimp Aquaculture Area in the Project Area	*2	ha	-	-	1,543	-	-	-
3. Proportion in the Project Area	*3	%	-	-	63%	63%	63%	63%
4. Projection in the Development Plan in the Province	*4	ha	-	-	-	-	3,045	4,019
5. Projection in the Project Area	*5	ha	-	-	-	1,600	1,900	2,500
II. Production Value								
1. Total Production Value in the Province	*1	Milli. VND	25,125	49,698	93,513	100,890		
2. Unit Production Value per ha		Milli. VND/ha	17.64	24.82	38.28	38.67	38.67	38.67
3. Production Value in the Project Area		Milli. VND	-	-	59,070	61,870	73,470	96,680
4. Production Cost		Milli. VND	-	-	-	30,930	36,730	48,330
5. Net Production Value		Milli. VND	-	-	-	30,940	36,740	48,350
III. Production Value								
1. Increment of Net Production Value from 2001		Milli. VND	-	-	-	-	5,800	17,410
2. Expressed in US\$ (US\$1 = VND15,068)		Milli. US\$					\$0.38	\$1.16
3. Economic Value (90%)		Milli. US\$					\$0.34	\$1.04

Note: *1: Statistical Yearbook 2001, Binh Dinh Province.
 *2: Feasibility Report, May 2000, HEC-1.
 *3: Same proportion is assumed in the future.
 *4: Agriculture and Rural Development Plan 2001 to 2010, DARD, Binh Dinh Province.
 *5: 2,500 ha is assumed as the maximum area.

Table N.10 Benefit accrued from Agriculture Sector in the Master Plan

(1) Irrigation Area

(unit: ha)

Construction Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
in 2007	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500
in 2008	-	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100	11,100
in 2009	-	-	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700	12,700
in 2010	-	-	-	500	500	500	500	500	500	500	500	500	500	500	500	500
in 2011	-	-	-	-	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000
in 2012	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300	300
in 2013	-	-	-	-	-	-	300	300	300	300	300	300	300	300	300	300
in 2014	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300	300
in 2015	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300	300
in 2016	-	-	-	-	-	-	-	-	-	300	300	300	300	300	300	300
in 2017	-	-	-	-	-	-	-	-	-	-	400	400	400	400	400	400
in 2018	-	-	-	-	-	-	-	-	-	-	-	400	400	400	400	400
in 2019	-	-	-	-	-	-	-	-	-	-	-	-	400	400	400	400
Accumulation	8,500	19,600	32,300	32,800	51,800	52,100	52,400	52,700	53,000	53,300	53,700	54,100	54,500	54,500	54,500	54,500

(2) Irrigation Benefit

(unit: thousand US\$)

Benefit Accrued from	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
in the year of 2008	-	2,173	2,796	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106	3,106
in the year of 2009	-	-	2,905	3,735	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150
in the year of 2010	-	-	-	3,389	4,358	4,841	4,841	4,841	4,841	4,841	4,841	4,841	4,841	4,841	4,841	4,841
in the year of 2011	-	-	-	-	105	135	150	150	150	150	150	150	150	150	150	150
in the year of 2012	-	-	-	-	-	5,323	6,981	7,604	7,604	7,604	7,604	7,604	7,604	7,604	7,604	7,604
in the year of 2013	-	-	-	-	-	-	91	117	130	130	130	130	130	130	130	130
in the year of 2014	-	-	-	-	-	-	-	91	117	130	130	130	130	130	130	130
in the year of 2015	-	-	-	-	-	-	-	-	91	117	130	130	130	130	130	130
in the year of 2016	-	-	-	-	-	-	-	-	-	91	117	130	130	130	130	130
in the year of 2017	-	-	-	-	-	-	-	-	-	-	91	117	130	130	130	130
in the year of 2018	-	-	-	-	-	-	-	-	-	-	-	121	156	173	173	173
in the year of 2019	-	-	-	-	-	-	-	-	-	-	-	-	121	156	173	173
in the year of 2020	-	-	-	-	-	-	-	-	-	-	-	-	-	187	170	170
Accumulation	0	2,173	5,701	10,230	11,719	17,555	19,319	20,059	20,189	20,319	20,449	20,609	20,778	21,017	21,017	21,017

(3) Total Benefit from Irrigation, Livestock and Aquaculture

(unit: thousand US\$)

Sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Irrigation	-	2,173	5,701	10,230	11,719	17,555	19,319	20,059	20,189	20,319	20,449	20,609	20,778	21,017	21,017	21,017
Livestock	-	-	123	260	368	490	490	490	490	490	490	490	490	490	490	490
Aquaculture	-	-	-	-	1,040	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Total	-	2,173	5,824	10,490	13,127	20,125	21,889	22,629	22,759	22,889	23,019	23,179	23,348	23,587	23,587	23,587

Table N.11 Flood Damage in Districts in Kone River Basin in 1999

Item	Unit	Total			Phu Cat		An Nhon		Tuy Phuoc		Tay Son		Vinh Thanh	
		Quantity	Unit price (1,000 VND)	Value (Million VND)	Quantity	Value (Million VND)	Quantity	Value (Million VND)	Quantity	Value (Million VND)	Quantity	Value (Million VND)	Quantity	Value (Million VND)
1. Total damage value	Million	-	-	83,877	-	18,798	-	25,606	-	19,669	-	13,818	-	5,987
2. Life Damage														
-Died	person	37			7		12		12		5		1	
-Injured	person	1								1				
-Sick	person	264							264					
3. Housing Damage				15,960		1,848		5,367		6,788		1,567		390
-Collapsed, blown away	count	614	12,000	7,368	107	1,284	126	1,512	360	4,320	11	132	10	120
-Broken, heavily flooded	count	243	6,000	1,458	34	204	110	660	30	180	24	144	45	270
-Flooded	count	18,939	300	5,682	1,200	360	10,650	3,195	5,400	1,620	1,689	507		-
-Broken well	count	3,460	400	1,384					1,500	600	1,960	784		-
-Broken, flooded hygiene works	count	227	300	68					227	68				-
4. Agricultural Damage				32,091		6,095		11,876		2,690		6,890		4,541
-Flooded winter paddy	ha	1,936	-	-	795	-	284	-	70	-	489	-	297	-
Of which: Completely lost	ha	664	6,000	3,984	185	1,110	122	729	70	420	223	1,338	65	387
Damaged	ha	1,101	3,000	3,302	610	1,830	163	488	-	199	597	129	387	
-Flooded seeded winter-spring paddy	ha	1,829	-	-	1,690	-	-	-	120	-	-	-	19	-
Of which: Completely lost	ha	1,255	1,000	1,255	443	443	800	800	-	-	-	-	12	12
Damaged	ha	3	500	1									3	1
-Blown away seeded winter-spring paddy	ton	120	4,000	480			120	480						-
-Blown away, damaged slide cassava	ton	-	-	-	-	-	-	-	-	-	-	-	-	-
-Blown away coconut	fruit	-	-	-	-	-	-	-	-	-	-	-	-	-
-Flooded crop	ha	398	-	-	135	-	65	-	35	-	117	-	47	-
Of which: Completely lost	ha	169	2,000	337	20	40	40	80	35	70	27	54	47	93
Damaged above 30%	ha	230	600	138	115	69	25	15	-	90	54			-
-Flooded industrial tree	ha	919	-	-			159	-			493	-	267	-
Of which: Completely lost	ha	687	9,000	6,187			122	1,098			298	2,682	267	2,407
Damaged above 30%	ha	232	3,000	695			37	110			195	585		-
-Flooded fruit tree	ha	12	-	-			12	-				-		-
Of which: Completely lost	ha	12	2,000	24			12	24				-		-
Damaged above 30%	ha	-	-	-			-	-			-	-		-
-Livestock														
Died, blown away cattle	head	85	500	43	85	43								
Died, blown away poultry	head	612	20	12	12	0					600	12		
-Alluvial, flooded field	ha	782	20,000	15,634	128	2,560	403	8,052	110	2,200	78	1,568	63	1,254
5. School Damage				432		90		90		90		132		30
-Students off school	count	42,820	-	-					42,820	-	-	-		-
-Flooded classroom	room	66	2,000	132						66	132			-
-Collapsed classroom	room	7	30,000	210	3	90			3	90			1	30
-Damaged classroom (above 30%)	room	9	10,000	90			9	90						-
-Collapsed fence	m	-	-	-	-	-	-	-	-	-	-	-	-	-
-Damaged desk	set	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Transportation Damage				11,847		2,123		3,399		4,350		1,192		782
-Eroded road:														
Length	m	263,453	-	-	24,899	-	86,314	-	96,350	-	23,370	-	32,520	-
Quatity	m ³	242,328	20	4,847	61,170	1,223	94,968	1,899	57,490	1,150	9,600	192	19,100	382
-100% broken transportation bridge, sluice	count	51	100,000	5,100	9	900			32	3,200	6	600	4	400
-Damaged transportation sluice gate, spill way	count	38	50,000	1,900			30	1,500			8	400		-
-Damaged flooded car	count	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Irrigation Damage				16,711		7,183		2,592		2,724		4,017		195
-Broken anf eroded dike:														
Length	m	17,022	-	-	4,690	-	5,107	-	5,700	-	1,525	-		-
Quatity	m ³	148,675	20	2,974	74,734	1,495	36,501	730	31,000	620	6,440	129		-
-Broken anf eroded canal:														
Length	m	128,330	-	-	4,505	-	55,568	-	23,500	-	23,380	-	21,377	-
Quatity	m ³	148,377	20	2,968	39,410	788	52,097	1,042	33,200	664	19,930	399	3,740	75
-Eroded reservoir	count	18	450,000	8,100	9	4,050			2	900	7	3,150		-
-Damaged pumping station	count	-	-	-	-	-	-	-	-	-	-	-	-	-
-Damaged small irrigation works	count	79	30,000	2,370	25	750	24	720	18	540	8	240	4	120
-Damaged strengthened dam	count	-	-	-	-	-	-	-	-	-	-	-	-	-
-Damaged concrete dam	count	3	100,000	300	1	100	1	100			1	100		-
8. Aquacultural Damage				4,855		1,235		1,750		1,865		-		5
-Sunk boat and ship	count	-	-	-	-	-	-	-	-	-	-	-	-	-
-Sunk ferry-boat	count	-	-	-	-	-	-	-	-	-	-	-	-	-
-Heavily damaged fish pond	ha	965	5,000	4,825	241	1,205	350	1,750	373	1,865			1	5
-Lost fish, shrimp	ton	3	10,000	30	3	30								-
9. Hospital Damage				40						20		20		-
-Broken, flooded clinic	count	4	10,000	40					2	20	2	20		-
-Collapsed clinic	room	-	-	-	-	-	-	-	-	-	-	-	-	-
-Damaged above 30% clinic	room	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Electricity, Telephone line Damage				26				4		22				-
-Damaged transformer station	count	-	-	-	-	-	-	-	-	-	-	-	-	-
-Collapsed electric, telephone post	count	13	2,000	26			2	4	11	22				-
-Broken Electricity, Telephone wive	m	-	-	-	-	-	-	-	-	-	-	-	-	-
11. Material Damage				1,916		224		528		1,120				44
-Foodgrains	ton	27	2,000	54			27	54						-
-Paddy seed	ton	465	4,000	1,862	56	224	118	474	280	1,120			11	44
-Fertilizer	ton	-	-	-	-	-	-	-	-	-	-	-	-	-
-Salt	ton	-	-	-	-	-	-	-	-	-	-	-	-	-
-Damaged stored cement	ton	-	-	-	-	-	-	-	-	-	-	-	-	-
12. People's famine														
-Famine households need aid	count	7,930	-	-	1,025	-	3,305	-	3,600	-	-	-	-	-

Table N.12 Estimation of Probable Flood Damage in Downstream Area of Kone River Basin in 2001 (2/2)

5% Late Flood - Without Project (Condition in 2001)

No.	Blk No.	Name of commune	Elevation (m)	House (nos)	Farmland (ha)	Damageable Value (VND mil)		Flood Water Level (m)		Average Inundation (m)		Damage Rates		Flood Damage (VND million)		
						House	Farmland	Overland	Inundation	Farmland	House	Farmland	House	Agriculture (for calculation only)	House	Total
TOTAL				32,639	4,894	391,668	29,366							9,255	5,792	15,047
87	o01	Cat Nhon	2.1	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
88	o02	Nhon Hanh	3.1	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
89	o03	Nhon Hanh	2.5	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
90	o04	Nhon Hanh	3.5	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
91	o05	Nhon Hanh	2.9	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
92	o06	Phuoc Hung	3.2	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
93	o07	Phuoc Hung	3.4	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
94	o08	Phuoc Quang	3	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
95	o09	Phuoc Hiep	3.7	233	34	2,796	205	0.6		0.6	0.6	0.3000	0.0025	61.6	7.0	69
96	p02	Cat Thang	2.4	216	2	2,592	14	0.6		0.6	0.6	0.3000	0.0025	4.1	6.5	11
97	p03	Nhon Hanh	2.7	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
98	p04	Nhon Hanh	2.4	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
99	p05	Nhon Hanh	2.8	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
100	p06	Phuoc Hung	2	291	65	3,492	390	0.6	2.0	0.6	0.6	0.3000	0.0025	117.0	8.7	126
101	p07	Phuoc Quang	2.5	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
102	p08	Phuoc Quang	2.4	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
103	p09	Phuoc Hoa	3.1	167	4	2,004	26	0.6		0.6	0.6	0.3000	0.0025	7.7	5.0	13
104	q02	Cat Thang	1.8	216	2	2,592	14	0.6	2.0	0.6	0.6	0.3000	0.0025	4.1	6.5	11
105	q03	Cat Thang	1.5	216	2	2,592	14	0.6	2.0	0.6	0.6	0.3000	0.0025	4.1	6.5	11
106	q04	Phuoc Thang	1.4	163	11	1,956	65	0.6	2.0	0.6	0.6	0.3000	0.0025	19.6	4.9	25
107	q05	Nhon Hanh	1.7	238	64	2,856	381	0.6	2.0	0.6	0.6	0.3000	0.0025	114.3	7.1	121
108	q06	Phuoc Thang	1.6	163	11	1,956	65	0.6	2.0	0.6	0.6	0.3000	0.0025	19.6	4.9	25
109	q07	Phuoc Quang	1.2	265	51	3,180	305	0.6	2.0	0.8	0.8	0.3000	0.0050	91.6	15.9	108
110	q08	Phuoc Hoa	2	167	4	2,004	26	0.6	2.0	0.6	0.6	0.3000	0.0025	7.7	5.0	13
111	q09	Phuoc Hiep	2	233	34	2,796	205	0.6	2.0	0.6	0.6	0.3000	0.0025	61.6	7.0	69
112	r02	Cat Thang	1.2	216	2	2,592	14	0.6	2.0	0.8	0.8	0.3000	0.0050	4.1	13.0	17
113	r03	Cat Thang	1.1	216	2	2,592	14	0.6	2.0	0.9	0.9	0.3000	0.0075	4.1	19.4	24
114	r04	Phuoc Thang	0.6	163	11	1,956	65	0.6	2.0	1.4	1.4	0.5800	0.0600	37.9	117.4	155
115	r05	Phuoc Thang	0.9	163	11	1,956	65	0.6	2.0	1.1	1.1	0.3700	0.0100	24.2	19.6	44
116	r06	Phuoc Thang	1.6	163	11	1,956	65	0.6	2.0	0.6	0.6	0.3000	0.0025	19.6	4.9	25
117	r07	Phuoc Hoa	1.1	167	4	2,004	26	0.6	2.0	0.9	0.9	0.3000	0.0075	7.7	15.0	23
118	r08	Phuoc Hoa	1.4	167	4	2,004	26	0.6	2.0	0.6	0.6	0.3000	0.0025	7.7	5.0	13
119	r09	Phuoc Son	1.8	194	22	2,328	130	0.6	2.0	0.6	0.6	0.3000	0.0025	39.1	5.8	45
120	s02	Cat Tien	0.7	127	0	1,524	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	19.1	19
121	s03	Cat Chanh	0.7	124	0	1,488	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	18.6	19
122	s04	Cat Chanh	0.7	124	0	1,488	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	18.6	19
123	s05	Phuoc Thang	0.5	163	11	1,956	65	0.6	2.0	1.5	1.5	0.6500	0.0625	42.5	122.3	165
124	s06	Phuoc Thang	0.8	163	11	1,956	65	0.6	2.0	1.2	1.2	0.4400	0.0100	28.8	19.6	48
125	s07	Phuoc Hoa	0.5	167	4	2,004	26	0.6	2.0	1.5	1.5	0.6500	0.0625	16.8	125.3	142
126	s08	Phuoc Hoa	0.6	167	4	2,004	26	0.6	2.0	1.4	1.4	0.5800	0.0600	15.0	120.2	135
127	s09	Phuoc Son	0.9	194	22	2,328	130	0.6	2.0	1.1	1.1	0.3700	0.0100	48.2	23.3	71
128	t03	Cat Chanh	0.7	124	0	1,488	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	18.6	19
129	t04	Cat Chanh	0.3	124	0	1,488	0	0.6	2.0	1.7	1.7	0.7900	0.1125	0.0	167.4	167
130	t05	Cat Chanh	0.2	124	0	1,488	0	0.6	2.0	1.8	1.8	0.8600	0.1600	0.0	238.1	238
131	t06	Phuoc Thang	0.2	163	11	1,956	65	0.6	2.0	1.8	1.8	0.8600	0.1600	56.2	313.0	369
132	t07	Phuoc Hoa	0.3	167	4	2,004	26	0.6	2.0	1.7	1.7	0.7900	0.1125	20.4	225.5	246
133	t08	Phuoc Hoa	0.4	167	4	2,004	26	0.6	2.0	1.6	1.6	0.7200	0.1100	18.6	220.4	239
134	t09	Phuoc Son	0.3	194	22	2,328	130	0.6	2.0	1.7	1.7	0.7900	0.1125	102.9	261.9	365
135	u03	Cat Tien	0.2	127	0	1,524	0	0.6	2.0	1.8	1.8	0.8600	0.1600	0.0	243.8	244
136	u04	Cat Chanh	0.2	124	0	1,488	0	0.6	2.0	1.8	1.8	0.8600	0.1600	0.0	238.1	238
137	u05	Phuoc Thang	-0.2	163	11	1,956	65	0.6	2.0	2.2	2.2	1.0000	0.2600	65.4	508.6	574
138	u06	Phuoc Thang	-0.2	163	11	1,956	65	0.6	2.0	2.2	2.2	1.0000	0.2600	65.4	508.6	574
139	u07	Phuoc Thang	-0.2	163	11	1,956	65	0.6	2.0	2.2	2.2	1.0000	0.2600	65.4	508.6	574
140	u08	Phuoc Hoa	0.3	167	4	2,004	26	0.6	2.0	1.7	1.7	0.7900	0.1125	20.4	225.5	246
141	u09	Phuoc Son	-0.2	194	22	2,328	130	0.6	2.0	2.2	2.2	1.0000	0.2600	130.2	605.3	735

Table N.14 Estimation of Probable Flood Damage of Downstream Areas

(1/6)

I. Condition in 2001

Without Project: Major Flood

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
Without Project	2	4,746	9,205	11,967	11,046	4,787	3,322	45,072	35,867
	5	22,242	9,845	12,799	11,814	5,119	15,569	77,388	67,543
	10	36,843	12,227	15,895	14,672	6,358	25,790	111,786	99,559
	20	49,200	14,585	18,961	17,502	7,584	34,440	142,272	127,687
	50	79,007	18,769	24,400	22,523	9,760	55,305	209,763	190,994
	100	103,171	22,505	29,257	27,006	11,703	72,220	265,861	243,356

1.1A: Major Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.1A	2	-	-	-	-	-	-	-	-
	5	97	6,223	8,090	7,468	3,236	68	25,181	18,958
	10	19,737	13,794	17,932	16,553	7,173	13,816	89,005	75,211
	20	52,363	14,040	18,252	16,848	7,301	36,654	145,458	131,418
	50	81,755	14,401	18,721	17,281	7,489	57,229	196,876	182,475
	100	104,324	14,780	19,214	17,736	7,686	73,027	236,766	221,986

1.3A: Major Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.3A	2	-	-	-	-	-	-	-	-
	5	20	5,325	6,923	6,390	2,769	14	21,441	16,116
	10	710	8,073	10,495	9,688	4,198	497	33,660	25,587
	20	25,097	13,903	18,074	16,684	7,230	17,568	98,555	84,652
	50	56,574	14,222	18,489	17,066	7,395	39,602	153,348	139,126
	100	84,183	14,488	18,834	17,386	7,534	58,928	201,353	186,865

1.5A: Major Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.5A	2	-	-	-	-	-	-	-	-
	5	-	88	114	106	46	-	354	266
	10	168	7,138	9,279	8,566	3,712	118	28,980	21,842
	20	10,321	11,636	15,127	13,963	6,051	7,225	64,322	52,686
	50	34,921	13,990	18,187	16,788	7,275	24,445	115,606	101,616
	100	64,519	14,222	18,489	17,066	7,395	45,163	166,855	152,633

1.1B: Major Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.1B	2	-	-	-	-	-	-	-	-
	5	41	6,198	8,057	7,438	3,223	29	24,986	18,788
	10	18,025	13,613	17,697	16,336	7,079	12,618	85,367	71,754
	20	39,095	13,704	17,815	16,445	7,126	27,367	121,552	107,848
	50	69,748	13,903	18,074	16,684	7,230	48,824	174,462	160,559
	100	85,185	14,040	18,252	16,848	7,301	59,630	201,255	187,215

1.3B: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.3B	2	-	-	-	-	-	-	-	-
	5	-	5,315	6,910	6,378	2,764	-	21,366	16,051
	10	139	7,970	10,361	9,564	4,144	97	32,276	24,306
	20	22,518	13,636	17,727	16,363	7,091	15,763	93,097	79,461
	50	48,511	13,794	17,932	16,553	7,173	33,958	137,921	124,127
	100	70,364	13,940	18,122	16,728	7,249	49,255	175,658	161,718

Table N.14 Estimation of Probable Flood Damage of Downstream Areas

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1.5B: Major Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.5B	2	-	-	-	-	-	-	-	-
	5	-	78	101	94	41	-	314	236
	10	41	7,069	9,190	8,483	3,676	29	28,487	21,418
	20	9,335	11,513	14,967	13,816	5,987	6,535	62,152	50,639
	50	30,717	13,663	17,762	16,396	7,105	21,502	107,144	93,481
	100	56,455	13,794	17,932	16,553	7,173	39,519	151,425	137,631

2B: Major Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
2B	2	139	7,970	10,361	9,564	4,144	97	32,276	24,306
	5	22,242	9,845	12,799	11,814	5,119	15,569	77,388	67,543
	10	36,843	12,227	15,895	14,672	6,358	25,790	111,786	99,559
	20	49,200	14,585	18,961	17,502	7,584	34,440	142,272	127,687
	50	79,007	18,769	24,400	22,523	9,760	55,305	209,763	190,994
	100	103,171	22,505	29,257	27,006	11,703	72,220	265,861	243,356

Without Project: Early Flood

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
Without Project	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	69	90	83	36	-	277
	50	41	5,343	6,946	6,412	2,778	29	21,549
	100	139	7,109	9,242	8,531	3,697	97	28,814

Without Project: Late Flood

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
Without Project	2	-	-	-	-	-	-	-
	5	20	5,327	6,925	6,392	2,770	14	21,449
	10	710	8,073	10,495	9,688	4,198	497	33,660
	20	5,792	9,255	12,032	11,106	4,813	4,054	47,052
	50	19,407	9,753	12,679	11,704	5,072	13,585	72,199
	100	39,801	12,322	16,019	14,786	6,407	27,861	117,196

1.1A: Late Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.1A	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	168	7,138	9,279	8,566	3,712	118	28,980
	100	33,875	13,940	18,122	16,728	7,249	23,713	113,626

1.3A: Late Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.3A	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	168	7,138	9,279	8,566	3,712	118	28,980
	100	19,737	13,794	17,932	16,553	7,173	13,816	89,005

Table N.14 Estimation of Probable Flood Damage of Downstream Areas

(3/6)

1.5A: Late Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.5A	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	168	7,138	9,279	8,566	3,712	118	28,980
	100	15,214	12,675	16,478	15,210	6,591	10,650	76,817

1.1B: Late Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.1B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	78	7,077	9,200	8,492	3,680	55	28,582
	100	30,717	13,663	17,762	16,396	7,105	21,502	107,144

1.3B: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.3B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	78	7,077	9,200	8,492	3,680	55	28,582
	100	18,025	13,613	17,697	16,336	7,079	12,618	85,367

1.5B: Late Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.5B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	78	7,077	9,200	8,492	3,680	55	28,582
	100	13,460	12,485	16,231	14,982	6,492	9,422	73,072

2B: Late Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
2B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	20	5,325	6,923	6,390	2,769	14	21,441
	20	168	7,995	10,394	9,594	4,157	118	32,426
	50	19,407	9,753	12,679	11,704	5,072	13,585	72,199
	100	39,801	12,322	16,019	14,786	6,407	27,861	117,196

Table N.14 Estimation of Probable Flood Damage of Downstream Areas

(4/6)

II. Condition in 2020

Without Project: Major Flood

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
Without Project	2	14,076	14,575	18,948	17,490	7,579	9,853	82,521	67,946
	5	65,965	15,588	20,264	18,706	8,106	46,176	174,804	159,216
	10	109,267	19,360	25,168	23,232	10,067	76,487	263,581	244,221
	20	145,922	23,093	30,021	27,712	12,008	102,145	340,901	317,808
	50	234,387	29,718	38,633	35,662	15,453	164,071	517,924	488,206
	100	306,120	35,633	46,323	42,760	18,529	214,284	663,649	628,016

1.1A: Major Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.1A	2	-	-	-	-	-	-	-	-
	5	288	9,853	12,809	11,824	5,124	202	40,099	30,246
	10	58,573	21,840	28,392	26,208	11,357	41,001	187,371	165,531
	20	155,397	22,230	28,899	26,676	11,560	108,778	353,540	331,310
	50	242,609	22,802	29,643	27,362	11,857	169,826	504,099	481,297
	100	309,570	23,402	30,423	28,082	12,169	216,699	620,345	596,943

1.3A: Major Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.3A	2	-	-	-	-	-	-	-	-
	5	61	8,431	10,960	10,117	4,384	43	33,996	25,565
	10	2,105	12,783	16,618	15,340	6,647	1,474	54,966	42,183
	20	74,478	22,014	28,618	26,417	11,447	52,135	215,109	193,095
	50	167,885	22,518	29,273	27,022	11,709	117,520	375,927	353,409
	100	249,809	22,939	29,821	27,527	11,928	174,866	516,890	493,951

1.5A: Major Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.5A	2	-	-	-	-	-	-	-	-
	5	-	140	182	168	73	-	563	423
	10	499	11,302	14,693	13,562	5,877	349	46,282	34,980
	20	30,629	18,424	23,951	22,109	9,580	21,440	126,134	107,710
	50	103,632	22,151	28,796	26,581	11,519	72,542	265,221	243,070
	100	191,464	22,518	29,273	27,022	11,709	134,025	416,011	393,493

1.1B: Major Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.1B	2	-	-	-	-	-	-	-	-
	5	122	9,814	12,758	11,777	5,103	85	39,660	29,846
	10	53,499	21,554	28,020	25,865	11,208	37,449	177,595	156,041
	20	116,032	21,697	28,206	26,036	11,282	81,222	284,476	262,779
	50	207,004	22,014	28,618	26,417	11,447	144,903	440,403	418,389
	100	252,815	22,230	28,899	26,676	11,560	176,971	519,150	496,920

1.3B: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.3B	2	-	-	-	-	-	-	-	-
	5	-	8,416	10,941	10,099	4,376	-	33,832	25,416
	10	412	12,619	16,405	15,143	6,562	288	51,429	38,810
	20	66,832	21,590	28,067	25,908	11,227	46,782	200,406	178,816
	50	143,977	21,840	28,392	26,208	11,357	100,784	332,558	310,718
	100	208,831	22,071	28,692	26,485	11,477	146,182	443,738	421,667

Table N.14 Estimation of Probable Flood Damage of Downstream Areas

(5/6)

1.5B: Major Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
1.5B	2	-	-	-	-	-	-	-	-
	5	-	124	161	149	64	-	498	374
	10	122	11,193	14,551	13,432	5,820	85	45,203	34,010
	20	27,705	18,228	23,696	21,874	9,479	19,394	120,375	102,147
	50	91,168	21,634	28,124	25,961	11,250	63,818	241,954	220,320
	100	167,555	21,840	28,392	26,208	11,357	117,289	372,640	350,800

2B: Major Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
2B	2	412	12,619	16,405	15,143	6,562	288	51,429	38,810
	5	65,965	15,588	20,264	18,706	8,106	46,176	174,804	159,216
	10	109,267	19,360	25,168	23,232	10,067	76,487	263,581	244,221
	20	145,922	23,093	30,021	27,712	12,008	102,145	340,901	317,808
	50	234,387	29,718	38,633	35,662	15,453	164,071	517,924	488,206
	100	306,120	35,633	46,323	42,760	18,529	214,284	663,649	628,016

Without Project: Early Flood

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
Without Project	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	109	142	131	57	-	438
	50	122	8,459	10,997	10,151	4,399	85	34,213
	100	412	11,257	14,634	13,508	5,854	288	45,954

Without Project: Late Flood

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
Without Project	2	-	-	-	-	-	-	-
	5	61	8,435	10,966	10,122	4,386	43	34,012
	10	2,105	12,783	16,618	15,340	6,647	1,474	54,966
	20	17,178	14,654	19,050	17,585	7,620	12,025	88,112
	50	57,554	15,442	20,075	18,530	8,030	40,288	159,919
	100	118,040	19,509	25,362	23,411	10,145	82,628	279,094

1.1A: Late Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.1A	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	499	11,302	14,693	13,562	5,877	349	46,282
	100	100,531	22,071	28,692	26,485	11,477	70,372	259,628

1.3A: Late Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.3A	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	499	11,302	14,693	13,562	5,877	349	46,282
	100	58,573	21,840	28,392	26,208	11,357	41,001	187,371

Table N.14 Estimation of Probable Flood Damage of Downstream Areas

(6/6)

1.5A: Late Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.5A	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	499	11,302	14,693	13,562	5,877	349	46,282
	100	45,149	20,068	26,088	24,082	10,435	31,604	157,427

1.1B: Late Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.1B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	230	11,205	14,567	13,446	5,827	161	45,435
	100	91,168	21,634	28,124	25,961	11,250	63,818	241,954

1.3B: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.3B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	230	11,205	14,567	13,446	5,827	161	45,435
	100	53,499	21,554	28,020	25,865	11,208	37,449	177,595

1.5B: Late Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
1.5B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-
	50	230	11,205	14,567	13,446	5,827	161	45,435
	100	39,949	19,768	25,698	23,722	10,279	27,964	147,381

2B: Late Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Total h
2B	2	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
	10	61	8,431	10,960	10,117	4,384	43	33,996
	20	499	12,659	16,457	15,191	6,583	349	51,737
	50	57,554	15,442	20,075	18,530	8,030	40,288	159,919
	100	118,040	19,509	25,362	23,411	10,145	82,628	279,094

Table N.15 Calculation of Annual Mean Flood Damage of Downstream Areas (1/6)

I. Condition in 2001

Without Project: Major Flood

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	35,867	17,934	8,967	8,967	0.60
	5	0.20	0.30	67,543	51,705	15,512	24,478	1.62
	10	0.10	0.10	99,559	83,551	8,355	32,834	2.18
	20	0.05	0.05	127,687	113,623	5,681	38,515	2.56
	50	0.02	0.03	190,994	159,340	4,780	43,295	2.87
	100	0.010	0.01	243,356	217,175	2,172	45,467	3.02

1.1A: Major Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	18,958	9,479	2,844	2,844	0.19
	10	0.10	0.10	75,211	47,085	4,708	7,552	0.50
	20	0.05	0.05	131,418	103,314	5,166	12,718	0.84
	50	0.02	0.03	182,475	156,946	4,708	17,426	1.16
	100	0.010	0.01	221,986	202,230	2,022	19,449	1.29

1.3A: Major Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	16,116	8,058	2,417	2,417	0.16
	10	0.10	0.10	25,587	20,851	2,085	4,502	0.30
	20	0.05	0.05	84,652	55,120	2,756	7,258	0.48
	50	0.02	0.03	139,126	111,889	3,357	10,615	0.70
	100	0.010	0.01	186,865	162,996	1,630	12,245	0.81

1.5A: Major Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.5A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	266	133	40	40	0.00
	10	0.10	0.10	21,842	11,054	1,105	1,145	0.08
	20	0.05	0.05	52,686	37,264	1,863	3,008	0.20
	50	0.02	0.03	101,616	77,151	2,315	5,323	0.35
	100	0.010	0.01	152,633	127,124	1,271	6,594	0.44

1.1B: Major Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	18,788	9,394	2,818	2,818	0.19
	10	0.10	0.10	71,754	45,271	4,527	7,345	0.49
	20	0.05	0.05	107,848	89,801	4,490	11,835	0.79
	50	0.02	0.03	160,559	134,203	4,026	15,861	1.05
	100	0.010	0.01	187,215	173,887	1,739	17,600	1.17

1.3B: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	16,051	8,026	2,408	2,408	0.16
	10	0.10	0.10	24,306	20,179	2,018	4,426	0.29
	20	0.05	0.05	79,461	51,884	2,594	7,020	0.47
	50	0.02	0.03	124,127	101,794	3,054	10,074	0.67
	100	0.010	0.01	161,718	142,922	1,429	11,503	0.76

Table N.15 Calculation of Annual Mean Flood Damage of Downstream Areas (2/6)

1.5B: Major Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.5B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	236	118	35	35	0.00
	10	0.10	0.10	21,418	10,827	1,083	1,118	0.07
	20	0.05	0.05	50,639	36,028	1,801	2,919	0.19
	50	0.02	0.03	93,481	72,060	2,162	5,081	0.34
	100	0.010	0.01	137,631	115,556	1,156	6,237	0.41

2B: Major Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
2B	-	1.00						
	2	0.50	0.50	24,306	12,153	6,076	6,076	0.40
	5	0.20	0.30	67,543	45,925	13,777	19,854	1.32
	10	0.10	0.10	99,559	83,551	8,355	28,209	1.87
	20	0.05	0.05	127,687	113,623	5,681	33,890	2.25
	50	0.02	0.03	190,994	159,340	4,780	38,670	2.57
	100	0.010	0.01	243,356	217,175	2,172	40,842	2.71

Without Project: Early Flood

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	277	139	7	7	0.00
	50	0.02	0.03	21,549	10,913	327	334	0.02
	100	0.010	0.01	28,814	25,182	252	586	0.04

Without Project: Late Flood

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	21,449	10,724	3,217	3,217	0.21
	10	0.10	0.10	33,660	27,555	2,755	5,973	0.40
	20	0.05	0.05	47,052	40,356	2,018	7,991	0.53
	50	0.02	0.03	72,199	59,625	1,789	9,779	0.65
	100	0.010	0.01	117,196	94,698	947	10,726	0.71

1.1A: Late Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,980	14,490	435	435	0.03
	100	0.010	0.01	113,626	71,303	713	1,148	0.08

1.3A: Late Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,980	14,490	435	435	0.03
	100	0.010	0.01	89,005	58,993	590	1,025	0.07

Table N.15 Calculation of Annual Mean Flood Damage of Downstream Areas (3/6)

1.5A: Late Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.5A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,980	14,490	435	435	0.03
	100	0.010	0.01	76,817	52,899	529	964	0.06

1.1B: Late Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,582	14,291	429	429	0.03
	100	0.010	0.01	107,144	67,863	679	1,107	0.07

1.3B: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,582	14,291	429	429	0.03
	100	0.010	0.01	85,367	56,974	570	998	0.07

1.5B: Late Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.5B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,582	14,291	429	429	0.03
	100	0.010	0.01	73,072	50,827	508	937	0.06

2B: Late Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
2B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	21,441	10,720	1,072	1,072	0.07
	20	0.05	0.05	32,426	26,933	1,347	2,419	0.16
	50	0.02	0.03	72,199	52,312	1,569	3,988	0.26
	100	0.010	0.01	117,196	94,698	947	4,935	0.33

Table N.15 Calculation of Annual Mean Flood Damage of Downstream Areas (4/6)

II. Condition in 2020

Without Project: Major Flood

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	67,946	33,973	16,986	16,986	1.13
	5	0.20	0.30	159,216	113,581	34,074	51,061	3.39
	10	0.10	0.10	244,221	201,719	20,172	71,233	4.73
	20	0.05	0.05	317,808	281,015	14,051	85,283	5.66
	50	0.02	0.03	488,206	403,007	12,090	97,374	6.46
	100	0.010	0.01	628,016	558,111	5,581	102,955	6.83

1.1A: Major Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	30,246	15,123	4,537	4,537	0.30
	10	0.10	0.10	165,531	97,888	9,789	14,326	0.95
	20	0.05	0.05	331,310	248,420	12,421	26,747	1.78
	50	0.02	0.03	481,297	406,303	12,189	38,936	2.58
	100	0.010	0.01	596,943	539,120	5,391	44,327	2.94

1.3A: Major Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	25,565	12,783	3,835	3,835	0.25
	10	0.10	0.10	42,183	33,874	3,387	7,222	0.48
	20	0.05	0.05	193,095	117,639	5,882	13,104	0.87
	50	0.02	0.03	353,409	273,252	8,198	21,302	1.41
	100	0.010	0.01	493,951	423,680	4,237	25,539	1.69

1.5A: Major Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.5A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	423	211	63	63	0.00
	10	0.10	0.10	34,980	17,702	1,770	1,834	0.12
	20	0.05	0.05	107,710	71,345	3,567	5,401	0.36
	50	0.02	0.03	243,070	175,390	5,262	10,663	0.71
	100	0.010	0.01	393,493	318,282	3,183	13,845	0.92

1.1B: Major Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	29,846	14,923	4,477	4,477	0.30
	10	0.10	0.10	156,041	92,944	9,294	13,771	0.91
	20	0.05	0.05	262,779	209,410	10,471	24,242	1.61
	50	0.02	0.03	418,389	340,584	10,218	34,459	2.29
	100	0.010	0.01	496,920	457,655	4,577	39,036	2.59

1.3B: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	25,416	12,708	3,812	3,812	0.25
	10	0.10	0.10	38,810	32,113	3,211	7,024	0.47
	20	0.05	0.05	178,816	108,813	5,441	12,464	0.83
	50	0.02	0.03	310,718	244,767	7,343	19,807	1.31
	100	0.010	0.01	421,667	366,192	3,662	23,469	1.56

Table N.15 Calculation of Annual Mean Flood Damage of Downstream Areas (5/6)

1.5B: Major Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.5B	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	374	187	56	56	0.00
	10	0.10	0.10	34,010	17,192	1,719	1,775	0.12
	20	0.05	0.05	102,147	68,079	3,404	5,179	0.34
	50	0.02	0.03	220,320	161,234	4,837	10,016	0.66
	100	0.010	0.01	350,800	285,560	2,856	12,872	0.85

2B: Major Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
2B	-	1.00						
	2	0.50	0.50	38,810	19,405	9,702	9,702	0.64
	5	0.20	0.30	159,216	99,013	29,704	39,406	2.62
	10	0.10	0.10	244,221	201,719	20,172	59,578	3.95
	20	0.05	0.05	317,808	281,015	14,051	73,629	4.89
	50	0.02	0.03	488,206	403,007	12,090	85,719	5.69
	100	0.010	0.01	628,016	558,111	5,581	91,300	6.06

Without Project: Early Flood

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	438	219	11	11	0.00
	50	0.02	0.03	34,213	17,325	520	531	0.04
	100	0.010	0.01	45,954	40,083	401	932	0.06

Without Project: Late Flood

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	34,012	17,006	5,102	5,102	0.34
	10	0.10	0.10	54,966	44,489	4,449	9,551	0.63
	20	0.05	0.05	88,112	71,539	3,577	13,128	0.87
	50	0.02	0.03	159,919	124,015	3,720	16,848	1.12
	100	0.010	0.01	279,094	219,506	2,195	19,043	1.26

1.1A: Late Flood - Flood Control Capacity of Dam: 221.22MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.1A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	46,282	23,141	694	694	0.05
	100	0.010	0.01	259,628	152,955	1,530	2,224	0.15

1.3A: Late Flood - Flood Control Capacity of Dam: 292.77MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
1.3A	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	46,282	23,141	694	694	0.05
	100	0.010	0.01	187,371	116,827	1,168	1,863	0.12

Table N.15 Calculation of Annual Mean Flood Damage of Downstream Areas (6/6)

1.5A: Late Flood - Flood Control Capacity of Dam: 375.52MCM - Existing Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million	
				Amount	Mean	Segment	Cumulative		
1.5A	-	1.00							
	2	0.50	0.50	-	-	-	-	-	
	5	0.20	0.30	-	-	-	-	-	
	10	0.10	0.10	-	-	-	-	-	
	20	0.05	0.05	-	-	-	-	-	
	50	0.02	0.03	0.03	46,282	23,141	694	694	0.05
	100	0.010	0.01	0.01	157,427	101,855	1,019	1,713	0.11

1.1B: Late Flood - Flood Control Capacity of Dam: 221.22MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million	
				Amount	Mean	Segment	Cumulative		
1.1B	-	1.00							
	2	0.50	0.50	-	-	-	-	-	
	5	0.20	0.30	-	-	-	-	-	
	10	0.10	0.10	-	-	-	-	-	
	20	0.05	0.05	-	-	-	-	-	
	50	0.02	0.03	0.03	45,435	22,718	682	682	0.05
	100	0.010	0.01	0.01	241,954	143,695	1,437	2,118	0.14

1.3B: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million	
				Amount	Mean	Segment	Cumulative		
1.3B	-	1.00							
	2	0.50	0.50	-	-	-	-	-	
	5	0.20	0.30	-	-	-	-	-	
	10	0.10	0.10	-	-	-	-	-	
	20	0.05	0.05	-	-	-	-	-	
	50	0.02	0.03	0.03	45,435	22,718	682	682	0.05
	100	0.010	0.01	0.01	177,595	111,515	1,115	1,797	0.12

1.5B: Late Flood - Flood Control Capacity of Dam: 375.52MCM - New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million	
				Amount	Mean	Segment	Cumulative		
1.5B	-	1.00							
	2	0.50	0.50	-	-	-	-	-	
	5	0.20	0.30	-	-	-	-	-	
	10	0.10	0.10	-	-	-	-	-	
	20	0.05	0.05	-	-	-	-	-	
	50	0.02	0.03	0.03	45,435	22,718	682	682	0.05
	100	0.010	0.01	0.01	147,381	96,408	964	1,646	0.11

2B: Late Flood - Without Dam - River Improvement with New Sea Dike Spillway

Alternative	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million	
				Amount	Mean	Segment	Cumulative		
2B	-	1.00							
	2	0.50	0.50	-	-	-	-	-	
	5	0.20	0.30	-	-	-	-	-	
	10	0.10	0.10	0.10	33,996	16,998	1,700	1,700	0.11
	20	0.05	0.05	0.05	51,737	42,867	2,143	3,843	0.26
	50	0.02	0.03	0.03	159,919	105,828	3,175	7,018	0.47
	100	0.010	0.01	0.01	279,094	219,506	2,195	9,213	0.61

Table N.16 Average Annual Flood Damage and Flood Mitigation Benefit

Unit: US\$ million

	Downstream Areas				Midstream Areas			Total	Probable flood damage in upstream area (7%)	Total probable flood damage	Flood mitigation benefit
	Major	Early	Late	Sub-total	Major	Late	Sub-total				
I. Condition in 2001											
Without Project	3.02	0.04	0.71	3.77	2.61	0.36	2.97	6.74	0.47	7.21	
1.1A	1.29	-	0.08	1.37	0.88	0.10	0.98	2.35	0.16	2.51	4.70
1.3A	0.81	-	0.07	0.88	0.71	0.12	0.83	1.71	0.12	1.83	5.38
1.5A	0.44	-	0.06	0.50	0.60	0.11	0.71	1.21	0.08	1.29	5.92
1.1B	1.17	-	0.07	1.24	0.88	0.10	0.98	2.22	0.16	2.38	4.84
1.3B	0.76	-	0.07	0.83	0.71	0.12	0.83	1.66	0.12	1.78	5.44
1.5B	0.41	-	0.06	0.47	0.60	0.11	0.71	1.18	0.08	1.26	5.95
2B (without dam)	2.71	-	0.33	3.04	2.61	0.36	2.97	6.01	0.47	6.48	0.73
II. Condition in 2020											
Without Project	6.83	0.06	1.26	8.15	7.21	0.93	8.14	16.29	1.14	17.43	
1.1A	2.94	-	0.15	3.09	2.30	0.28	2.58	5.67	0.40	6.07	11.36
1.3A	1.69	-	0.12	1.81	1.83	0.27	2.10	3.91	0.27	4.18	13.25
1.5A	0.92	-	0.11	1.03	1.52	0.27	1.79	2.82	0.20	3.02	14.41
1.1B	2.59	-	0.14	2.73	2.30	0.28	2.58	5.31	0.37	5.68	11.75
1.3B	1.56	-	0.12	1.68	1.83	0.27	2.10	3.78	0.26	4.04	13.39
1.5B	0.85	-	0.11	0.96	1.52	0.27	1.79	2.75	0.19	2.94	14.49
2B (without dam)	6.06	-	0.61	6.67	7.21	0.93	8.14	14.81	1.14	15.95	1.48

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Table N.17 Economic Benefits of the Alternatives in 2020

Alternative	Economic Benefits of the Alternatives (US\$ million)				Total
	Irrigation & drainage	Hydropower	Water supply	Flood mitigation	
I. Including La Tinh River Basin					
I-1 With Dam					
A Without New Sea Dyke Spillway					
I-1.1A	23.59	1.82	37.52	11.36	74.29
I-1.2A	23.59	2.10	37.52	7.94	71.15
I-1.3A	23.59	1.89	37.52	13.25	76.25
I-1.4A	23.59	2.23	37.52	10.64	73.98
I-1.5A	23.59	1.89	37.52	14.41	77.41
I-1.6A	23.59	2.23	37.52	12.71	76.05
B With New Sea Dyke Spillway					
I-1.1B	23.59	1.82	37.52	11.75	74.68
I-1.2B	23.59	2.10	37.52	8.66	71.87
I-1.3B	23.59	1.89	37.52	13.39	76.39
I-1.4B	23.59	2.23	37.52	11.08	74.42
I-1.5B	23.59	1.89	37.52	14.49	77.49
I-1.6B	23.59	2.23	37.52	12.94	76.28
I-2 Without Dam					
I-2B	0.00	0.00	37.52	1.48	39.00
II. Excluding La Tinh River Basin					
II-1 With Dam					
A Without New Sea Dyke Spillway					
II-1.1A	20.87	1.82	37.52	11.36	71.57
II-1.2A	20.87	2.10	37.52	7.94	68.43
II-1.3A	20.87	1.89	37.52	13.25	73.53
II-1.4A	20.87	2.23	37.52	10.64	71.26
II-1.5A	20.87	1.89	37.52	14.41	74.69
II-1.6A	20.87	2.23	37.52	12.71	73.33
B With New Sea Dyke Spillway					
II-1.1B	20.87	1.82	37.52	11.75	71.96
II-1.2B	20.87	2.10	37.52	8.66	69.15
II-1.3B	20.87	1.89	37.52	13.39	73.67
II-1.4B	20.87	2.23	37.52	11.08	71.70
II-1.5B	20.87	1.89	37.52	14.49	74.77
II-1.6B	20.87	2.23	37.52	12.94	73.56
II-2 Without Dam					
II-2B	0.00	0.00	37.52	1.48	39.00

Table N.18 Financial and Economic Project Cost

I-1.3B: Dinh Binh Reservoir (Dam Crest EL.: 100.3m), River Improvement with New Sea Dike Spillway, incl. La Tinh River Basin

Unit: Million VND

Description	Financial Cost					Economic Cost without Price Escalation				
	Dinh Binh Reservoir (El.100.3m) incl. hydropower	Flood Control facilities with new sea dike spillway	Irrigation & drainage facilities w/ La Tinh	Domestic & industrial water supply	Total	Dinh Binh Reservoir (El.100.3m) incl. hydropower	Flood Control facilities with new sea dike spillway	Irrigation & drainage facilities w/ La Tinh	Domestic & industrial water supply	Total
1. Direct Construction Cost	722,854	699,931	1,472,538	2,001,996	4,897,319	650,569	629,938	1,325,284	1,801,796	4,407,587
(1) Civil works	591,904	699,931	1,472,538	2,001,996	4,766,369	532,714	629,938	1,325,284	1,801,796	
(2) Plant works	130,950	-	-	-	130,950	117,855	-	-	-	
2. Indirect Construction Cost										
(1) Resettlement Cost	134,656	27,580	79,294	-	241,530	121,190	24,822	71,365	-	217,377
(2) Engineering Cost	50,507	69,993	147,254	138,353	406,107	45,456	62,994	132,529	124,518	365,497
(3) Administration Cost	15,087	21,825	46,555	41,506	124,973	13,578	19,643	41,900	37,355	112,476
(4) Price Escalation (4.9%/year)	373,905	652,057	912,413	1,850,733	3,789,108	-	-	-	-	-
(5) Physical Contingency (Plant:5%,other:10%)	123,153	147,139	265,805	403,259	939,356	77,187	73,740	157,108	196,367	504,402
Sub-total (1)~(5)	697,308	918,594	1,451,321	2,433,851	5,501,074	257,411	181,199	402,902	358,240	1,199,752
Total (1.+ 2.)	1,420,162	1,618,525	2,923,859	4,435,847	10,398,393	907,980	811,137	1,728,186	2,160,036	5,607,339
3. VAT (5%)	56,972	71,520	128,263	201,629	458,384	-	-	-	-	-
Total (1.+ 2.+ 3.)	1,477,134	1,690,045	3,052,122	4,637,476	10,856,777	907,980	811,137	1,728,186	2,160,036	5,607,339
Equivalent Million US\$	98.03	112.16	202.56	307.77	720.52	60.26	53.83	114.69	143.35	372.14

Table N.19 Annual Economic Project Cost

I-1.3B: Dinh Binh Reservoir, River Improvement with New Sea Dike Spillways, Irrigation Development incl. La Tinh River Basin, and Water Supply

Unit: Million US\$

Cost Item	Total (Million VND)	Equivalent (Million US\$)	Year																		
			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1. Dinh Binh Reservoir (El: 100.3m) including Hydropower																					
(1) Direct Construction Cost	650,569	43.18	-	-	-	2.26	2.26	8.27	6.01	6.64	8.91	8.82	-	-	-	-	-	-	-	-	-
a. Civil works	532,714	35.35	-	-	-	2.26	2.26	8.27	6.01	6.01	8.27	2.26	-	-	-	-	-	-	-	-	-
b. Plant works	117,855	7.82	-	-	-	-	-	-	-	0.63	0.63	6.55	-	-	-	-	-	-	-	-	-
(2) Indirect Construction Cost																					
a. Resettlement cost	121,190	8.04	-	2.33	2.33	2.33	1.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Engineering cost	45,456	3.02	-	-	-	0.48	0.42	0.42	0.42	0.42	0.42	0.42	-	-	-	-	-	-	-	-	-
c. Administration cost	13,578	0.90	-	-	-	0.14	0.13	0.13	0.13	0.13	0.13	0.13	-	-	-	-	-	-	-	-	-
d. Physical contingency	77,187	5.12	-	0.23	0.23	0.52	0.39	0.88	0.66	0.69	0.91	0.61	-	-	-	-	-	-	-	-	-
Subtotal of (2)	257,411	17.08	-	2.57	2.57	3.48	1.98	1.43	1.20	1.24	1.46	1.16	-	-	-	-	-	-	-	-	-
Total of (1) + (2)	907,980	60.26	-	2.57	2.57	5.74	4.24	9.70	7.21	7.88	10.37	9.97	-	-	-	-	-	-	-	-	-
2. Flood Control Facilities																					
(1) Direct Construction Cost	629,938	41.81	-	-	-	-	-	-	-	-	-	-	-	12.96	12.96	7.11	4.60	4.18	-	-	-
(2) Indirect Construction Cost																					
a. Resettlement cost	24,822	1.65	-	-	-	-	-	-	0.48	0.48	0.48	0.21	-	-	-	-	-	-	-	-	-
b. Engineering cost	62,994	4.18	-	-	-	-	-	-	-	-	0.67	0.59	0.59	0.59	0.59	0.59	0.59	0.59	-	-	-
c. Administration cost	19,643	1.30	-	-	-	-	-	-	0.16	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-	-	-
d. Physical contingency	73,740	4.89	-	-	-	-	-	-	0.06	0.06	0.13	0.09	1.37	1.37	0.78	0.53	0.49	-	-	-	-
Subtotal of (2)	181,199	12.03	-	-	-	-	-	-	0.70	0.68	1.42	1.04	2.10	2.10	1.51	1.26	1.22	-	-	-	-
Total of (1) + (2)	811,137	53.83	-	-	-	-	-	-	0.70	0.68	1.42	1.04	15.06	15.06	8.62	5.86	5.40	-	-	-	-
3. Irrigation and Drainage Facilities																					
(1) Direct Construction Cost	1,325,284	87.95	-	-	-	-	-	20.23	16.71	16.71	11.43	12.31	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.93	-
(2) Indirect Construction Cost																					
a. Resettlement cost	71,365	4.74	-	1.37	1.37	1.37	0.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Engineering cost	132,529	8.80	-	-	-	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.55	-
c. Administration cost	41,900	2.78	-	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-
d. Physical contingency	157,108	10.43	-	0.15	0.15	0.21	0.14	2.10	1.75	1.75	1.22	1.31	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.26	-
Subtotal of (2)	402,902	26.74	-	1.69	1.69	2.34	1.51	2.85	2.50	2.50	1.97	2.06	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.96	-
Total of (1) + (2)	1,728,186	114.69	-	1.69	1.69	2.34	1.51	23.08	19.21	19.21	13.41	14.37	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.90	-
4. Domestic and Industrial Water Supply Facilities																					
(1) Direct Construction Cost	1,801,796	119.58	-	-	-	-	-	4.19	23.08	23.08	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	6.46	23.08	22.96
(2) Indirect Construction Cost																					
a. Resettlement cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Engineering cost	124,518	8.26	-	-	-	0.50	0.91	0.91	0.91	0.91	-	-	-	-	-	0.50	0.91	0.91	0.91	0.91	-
c. Administration cost	37,355	2.48	-	-	-	0.15	0.27	0.27	0.27	0.27	-	-	-	-	-	0.15	0.27	0.27	0.27	0.27	-
d. Physical contingency	196,367	13.03	-	-	-	0.06	0.12	0.54	2.43	2.43	0.24	0.24	0.24	0.24	0.24	0.30	0.36	0.76	2.43	2.41	-
Subtotal of (2)	358,240	23.77	-	-	-	0.71	1.30	1.72	3.61	3.61	0.24	0.24	0.24	0.24	0.24	0.95	1.54	1.95	3.61	3.60	-
Total of (1) + (2)	2,160,036	143.35	-	-	-	0.71	1.30	5.90	26.69	26.69	2.63	2.63	2.63	2.63	2.63	3.34	3.93	8.40	26.69	26.55	-
5. Whole Projects																					
(1) Direct Construction Cost	4,407,587	292.51	(1)	-	-	2.26	2.26	32.69	45.80	46.43	22.73	23.52	16.58	16.58	10.73	8.22	7.80	7.69	24.31	24.89	-
(2) Indirect Construction Cost																					
a. Resettlement cost	217,377	14.43	-	3.71	3.71	3.71	1.66	-	0.48	0.48	0.48	0.21	-	-	-	-	-	-	-	-	-
b. Engineering cost	365,497	24.26	-	-	-	1.57	1.92	1.92	1.92	1.92	1.68	1.60	1.17	1.17	1.17	1.67	2.08	1.50	1.50	1.45	-
c. Administration cost	112,476	7.46	-	0.16	0.16	0.46	0.56	0.56	0.72	0.71	0.43	0.43	0.31	0.31	0.31	0.46	0.58	0.44	0.44	0.43	-
d. Physical contingency	504,402	33.48	-	0.39	0.39	0.80	0.64	3.52	4.89	4.92	2.50	2.25	1.81	1.81	1.22	1.03	1.05	0.96	2.62	2.68	-
Subtotal of (2)	1,199,752	79.62	-	4.26	4.26	6.53	4.79	6.00	8.01	8.03	5.09	4.49	3.29	3.29	2.70	3.16	3.71	2.90	4.56	4.56	-
Total of (1) + (2)	5,607,339	372.14	-	4.26	4.26	8.79	7.05	38.69	53.81	54.46	27.82	28.02	19.87	19.87	13.43	11.38	11.51	10.59	28.87	29.45	-

Table N.22 Economic Farmgate Price of Products and Inputs (1/3)

Commodity and Operation	Unit	Price per Unit	Remarks
(*1)			
I. Paddy/Rice (Export Parity)			
1. CIF Bangkok	ton	\$164.8	White rice (Thai), 5% broken, milled.
2. Quality adjustment	ton	\$156.6	Adjusted to 95% of CIF Bangkok (*2).
3. Freight and insurance	- ton	\$20.0	
4. FOB Da Nang	ton	\$136.6	
Expressed in VND	ton	D2,058,300	Exchange rate: US\$1.0 = VND15,068
5. Transport & handling	- ton	D193,200	Between Qui Nhon and Da Nang (300 km)
6. Ex-mill price at Binh Dinh	ton	D1,865,100	
7. Conversion to paddy	ton	D1,212,300	Recovery rate: 65%.
8. Value of by-product	+ ton	D576,000	Rice husk & bran for animal feed, equivalent to maize.
9. Milling Charges	- ton	D24,200	2% of paddy value at ex-mill price (item 7).
10. Mill gate price	ton	D1,764,100	
10. Transport to rice mill	- ton	D14,000	Transport cost within the area (20 km).
11. Economic farm gate price	ton	D1,750,100	
Expressed per kg	kg	D1,750	
II. Maize (Import Parity)			
1. FOB US Gulf ports	ton	\$79.3	No.2, yellow.
2. Quality adjustment	ton	\$51.5	Ajusted to 65% of FOB US (*3).
3. Freight and insurance	+ ton	\$43.0	
4. CIF Da Nang	ton	\$94.5	
Expressed in VND	ton	D1,423,900	Exchange rate: US\$1.0 = VND15,068
5. Transport & handling cost	+ ton	D193,200	Between Qui Nhon and Da Nang (300 km)
6. Wholesale price	ton	D1,617,100	at Qui Nhon
7. Inland transportation	- ton	D14,000	Transport cost within the area (20 km).
8. Economic farm gate price	ton	D1,603,100	
Expressed per kg	kg	D1,600	Competition with imported animal feed.
III. Groundnuts (Export Parity)			
1. CIF North Europe	ton	\$534.0	Groundnuts oil, Rotterdam.
2. Quality Adjustment	ton	\$507.3	Ajusted to 95% of FOB North Europe (*4).
3. Freight and insurance	- ton	\$45.0	
4. FOB Da Nang	ton	\$462.3	
Expressed in VND	ton	D6,965,900	Exchange rate: US\$1.0 = VND15,068
5. Handling cost	- ton	D58,200	at Da Nang
6. Ex-mill price at Ho Chi Minh	ton	D6,907,700	
7. Equivalent to groundnuts	ton	D2,763,100	Recovery rate: 40%.
8. Processing cost	- ton	D138,200	5% of raw nuts value at ex-mill price (item 5).
9. Value of by-product (feed)	+ ton	D665,300	Meal for anima feed, maize equivalent.
10. Mill gate price	ton	D3,290,200	at Da Nang
11. Inland transport	- ton	D193,200	Between Site and Da Nang (300 km)
12. Economic farm gate price	ton	D3,097,000	
Expressed per kg	kg	D3,100	

Note: *1: International market price in 2015 deflated to 2001 constant price by the manufacturing unit value, quoted from the Appendix 2: Grobal Commodity Price Prospects of "Global Economic Prospects and the Developing Countries, 2002".

*2: Adjustment estimated based on the past export record of Vietnam, taking into account the price differences among 5%, 25% & 35% in Bankok market.

*3: Ajustment estimated based on import substitution for animal feed.

*4: Ajustment assumed groundnut oil export quality.

Table N.22 Economic Farmgate Price of Products and Inputs (2/3)

Commodity and Operation	Unit	Price per Unit	Remarks
(*1)			
IV. Soybeans (Import Parity)			
1. FOB North Europe	ton	\$164.8	based on CIF at Rotterdam from US
2. Quality Adjustment	ton	\$164.8	No adjustment applied
3. Freight and insurance	+ ton	\$45.0	
4. FOB Ho Chi Minh	ton	\$209.8	
Expressed in VND	ton	D3,161,300	Exchange rate: VND15,068 per \$1.0
5. Transport & handling	+ ton	D386,700	Between Qui Nhon and Ho Chi Minh (730 km)
6. Wholesale price	ton	D3,548,000	at Qui Nhon
7. Inland transport	- ton	D13,200	Between site and Qui Nhon (20 km)
8. Economic farm gate price	ton	D3,534,800	
Expressed per kg	kg	D3,530	
V. Tobacco (Export Parity)			
1. CIF North Europe	ton	\$2,105.2	
2. Quality Adjustment	ton	\$1,999.9	Ajusted to 95% of FOB North Europe
3. Freight and insurance	- ton	\$45.0	
4. FOB Ho Chi Minh	ton	\$1,954.9	
Expressed in VND	ton	D29,456,400	Exchange rate: VND15,068 per \$1.0
5. Handling cost	- ton	D58,200	at Saigon Port
6. Inland transportation	- ton	D132,000	Dong Nai to Ho Chi Minh (200 km)
7. Ex-factory price at Dong Nai	ton	D29,266,200	
Conversion to material	ton	D8,779,900	Raw tobacco leaf recovery: 21%
8. Processing cost	- ton	D2,791,100	
9. Factory gate price	ton	D5,988,800	
10. Inland transportation	- ton	D231,000	Site to Dong Nai factory (350 km)
11. Economic farm gate price	ton	D5,757,800	Price after preparation and curing
Expressed per kg	kg	D5,760	
VI. Sugarcane (Import Parity)			
1. FOB North Europe	ton	\$160.0	
2. Quality Adjustment	+ ton	\$140.0	Ajusted to 85% of FOB North Europe
3. Freight and insurance	+ ton	\$45.0	
4. CIF Da Nang	ton	\$185.0	
Expressed in VND	ton	D2,788,000	Exchange rate: VND15,068 per \$1.0
5. Handling cost	+ ton	D58,200	at Da Nang Port
6. Inland Transportation	+ ton	D148,500	Between Qui Nhon and Da Nang (330 km)
7. Wholesale Price		D2,994,700	at Qui Nhon
8. Inland Transportation	- ton	D19,800	Between Qui Nhon and Tay Son (30 km)
9. Ex-mill factory price	ton	D2,974,900	as sugar at Tay Son.
Value as sugarcane		D252,900	Recovery of sugar from sugarcane: 8.5%
10. Processing Cost	- ton	D35,400	
11. By-product (molasses 5.2%)	+ ton	D0	Molasses, baggase, filtered mud, etc.
12. Mill gate price	ton	D217,500	
13. Transport from farm to mill	- ton	D10,900	
14. Economic farm gate price	ton	D206,600	
Expressed per kg	kg	D210	

Note: *1: International market price in 2015 deflated to 2001 constant price by the manufacturing unit value, quoted from the Appendix 2: Global Commodity Price Prospects of "Global Economic Prospects and the Developing Countries, 2002".

*: Inland transportation cost VND450 / ton km for short distance, and VND660 / ton km for long distance.

Table N.22 Economic Farmgate Price of Products and Inputs (3/3)

Commodity and Operation	Unit	Price per Unit	Remarks
(*1)			
VII. DAP: diammonium phosphate (Import Parity)			
FOB US Gulf	ton	\$121.7	Bulk, spot.
Freight and insurance	+ ton	\$43.0	
CIF Da Nang	ton	\$164.7	
Expressed in VND	ton	D2,481,700	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,674,900	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,688,900	
Expressed per kg	kg	D2,690	
Effective content N	kg	D12,810	Total N: 21%, total P ₂ O ₅ : 53%.
Effective content P ₂ O ₅	kg	D5,080	
VIII. Potassium Chloride (Import Parity)			
FOB North America	ton	\$79.3	Standard grade, spot, Vancouver
Freight and insurance	+ ton	\$43.0	
CIF Da Nang	ton	\$122.3	
Expressed in VND	ton	D1,842,800	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,036,000	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,050,000	
Expressed per kg	kg	D2,050	
Effective content	kg	D3,730	Total K ₂ O: 55% on average (48% to 62%).
IX. TSP: triple super-phosphate (Import Parity)			
FOB US Gulf	ton	\$100.7	Bulk, spot.
Freight and insurance	+ ton	\$43.0	
CIF Da Nang	ton	\$143.7	
Expressed in VND	ton	D2,165,300	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,358,500	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,372,500	
Expressed per kg	kg	D2,370	
As effective content	kg	D5,150	Total P ₂ O ₅ : 46% on average (43% to 49%).
X. Urea (Import Parity)			
FOB Eastern Europe	ton	\$91.5	Bulk or bagged, spot.
Freight and insurance	+ ton	\$45.0	
CIF Da Nang	ton	\$136.5	
Expressed in VND	ton	D2,056,800	Exchange rate: VND15,068 per \$1.0
Transport & handling	+ ton	D58,200	at Da Nang Port
Inland transport	+ ton	D135,000	Danag - Qui Nhon (300 km)
Wholesale price	ton	D2,250,000	at Qui Nhon
Inland transport	+ ton	D14,000	Between site and Qui Nhon (average 20 km)
Economic farm gate price	ton	D2,264,000	
Expressed per kg	kg	D2,260	
Effective content	kg	D5,380	Total N: 42%.

Note: *1: International market price in 2015 deflated to the 2001 constant price by the manufacturing unit value, quoted from the Appendix 2: Global Commodity Price Prospects of "Global Economic Prospects and the Developing Countries, 2002".

Table N.23 List of Financial and Economic Price of Products and Inputs

	Unit	Financial *1	Economic *2	Remarks
1. Agricultural Products				
1.1 Paddy	VND/kg	1,500 - 1,800	1,750	*3: Export parity
1.2 Maize	VND/kg	1,330	1,600	*3: Import parity
1.3 Groundnuts	VND/kg	4,260	3,100	*3: Export parity
1.4 Soybeans	VND/kg	4,150	3,530	*3: Import parity
1.5 Tobacco	VND/kg	7,000 - 9,000	5,760	*3: Export parity
1.6 Sugarcane *6	VND/kg	200 - 220	210	*3: Import parity
1.7 Cassava	VND/kg	230	207	*4
1.8 Pineapple	VND/kg	750	675	*4
2. Agricultural Inputs				
2.1 Farm Mannure	VND/kg	70	63	*4
2.2 Nitrogen Fertilizer	VND/kg	2,200	2,260	*4
2.3 Phosphorus Fertilizer	VND/kg	3,000	2,690	*4
2.4 Potassium Fertilizer	VND/kg	2,200	2,050	*4
DAP	VND/kg	-	2,690	*3: Import parity
DAP (N value)	VND/kg	-	12,810	*3: Import parity
DAP (P ₂ O ₅)	VND/kg	-	5,080	*3: Import parity
Potassium Chloride	VND/kg	-	2,050	*3: Import parity
Potassium Chloride (K ₂ O)	VND/kg	-	3,730	*3: Import parity
TSP	VND/kg	-	2,370	*3: Import parity
TSP (P ₂ O ₅)	VND/kg	-	5,150	*3: Import parity
Urea	VND/kg	2,200	2,260	*3: Import parity
Urea (N)	VND/kg	-	5,380	*3: Import parity
Lime	VND/kg	500	450	*4
2.5 Agro-chemicals	VND/lit.	40,000	36,000	*4
2.6 Seed & Planting Material				
- Paddy	VND/kg	2,000	1,800	*4
- Maize	VND/kg	2,500	2,300	*4
- Groundnuts	VND/kg	2,300	2,100	*4
- Soybeans	VND/kg	2,400	2,200	*4
- Tobacco	VND/kg	3,500	3,200	*4
- Sugarcane	VND/plant	500	450	*4
- Cassava	VND/plant	55	50	*4
- Pineapple	VND/plant	55	270	*4
3. Farming Operation				
3.1 Farm Labour (hired)	VND/day	3,000	13,500	*4, *7
3.2 Machinery for Land Prepar	VND/hr.	16,700	15,000	*4

Remarks *1: Price ranges expressed at current price in early 2003.

*2: Expressed at constant 2001 prices.

*3: Economic prices at 2001 constant price are projected based on the international price forecast in 2015.

*4: Modification of the previous studies based on the field interviews

*5: Economic prices are obtained using the standard conversion factor (0.9).

*6: Average farm gate prices of the sugar mill factory at Tay Son and farm interviews.

*7: Financial labour price is VND15,000 per day for average hired labour, however, the price above is counting the family labour 80% and the remaining 20% is counted through labour exchanges.

Table N.24 Economic Crop Budget under Without-Project (1/2)

	Unit	Irrigated Winter-Spring Paddy			Irrigated Summer-Autumn Paddy			Irrigated 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,750	5,000	8,750,000	1,750	4,400	7,700,000	1,750	3,400	5,950,000
2. Production Cost				3,628,770			3,374,850			3,145,970
2.1 Labour	man day	13,500	100	1,350,000	13,500	100	1,350,000	13,500	100	1,350,000
2.2 Input				1,335,970			1,169,150			1,066,170
- Seed	kg	1,800	140	252,000	1,800	130	234,000	1,800	120	216,000
- Manure	kg	63	690	43,470	63	550	34,650	63	490	30,870
- Nitrogen	kg	2,260	170	384,200	2,260	150	339,000	2,260	130	293,800
- Phosphate	kg	2,690	120	322,800	2,690	100	269,000	2,690	100	269,000
- Potassium	kg	2,050	110	225,500	2,050	90	184,500	2,050	90	184,500
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	2	72,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	17	255,000	15,000	16	240,000
2.4 Irrigation	6%			525,000			462,000			357,000
2.5 Others	5%			147,800			138,700			132,800
3. Net Income				5,121,230			4,325,150			2,804,030

	Unit	Irrigated Maize			Irrigated Groundnuts			Irrigated Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,600	3,500	5,600,000	3,100	1,500	4,650,000	3,530	1,200	4,236,000
2. Production Cost				2,547,278			2,401,130			2,559,030
2.1 Labour	man day	13,500	70	945,000	13,500	70	945,000	13,500	80	1,080,000
2.2 Input				1,010,978			926,030			965,030
- Seed	kg	2,000	160	320,000	2,100	170	357,000	2,200	180	396,000
- Manure	kg	63	6	378	63	10	630	63	10	630
- Nitrogen	kg	2,260	140	316,400	2,260	70	158,200	2,260	70	158,200
- Phosphate	kg	2,690	80	215,200	2,690	80	215,200	2,690	80	215,200
- Potassium	kg	2,050	60	123,000	2,050	60	123,000	2,050	60	123,000
- Chemicals	lit	36,000	1	36,000	36,000	2	72,000	36,000	2	72,000
2.3 Machinery	hrs	15,000	10	150,000	15,000	10	150,000	15,000	10	150,000
2.4 Irrigation	6%			336,000			279,000			254,200
2.5 Others	5%			105,300			101,100			109,800
3. Net Income				3,052,722			2,248,870			1,676,970

	Unit	Irrigated Tobacco			Irrigated Sugarcane (average annual cost)			Price VDN	Q'ty	Amount VDN/ha
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha			
1. Gross Income	kg	5,760	1,510	8,697,600	210	49,700	10,437,000	-	-	-
2. Production Cost				5,814,230			7,136,430			-
2.1 Labour	man day	13,500	250	3,375,000	13,500	220	2,970,000	-	-	-
2.2 Input				1,395,330			2,960,230			-
- Seed	kg	3,200	180	576,000	450	5,000	2,250,000	-	-	-
- Manure	kg	63	10	630	63	10	630	-	-	-
- Nitrogen	kg	2,260	180	406,800	2,260	120	271,200	-	-	-
- Phosphate	kg	2,690	10	26,900	2,690	60	161,400	-	-	-
- Potassium	kg	2,050	100	205,000	2,050	100	205,000	-	-	-
- Chemicals	lit	36,000	5	180,000	36,000	2	72,000	-	-	-
2.3 Machinery	hrs	15,000	18	270,000	15,000	18	270,000	-	-	-
2.4 Irrigation	6%			521,900			626,200			-
2.5 Others	5%			252,000			310,000			-
3. Net Income				2,883,370			3,300,570			-

Table N.24 Economic Crop Budget under Without-Project (2/2)

	Unit	Rainfed Winter-Spring Paddy			Rainfed Summer-Autumn Paddy			Rainfed 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,750	3,500	6,125,000	1,750	3,200	5,600,000	1,750	2,800	4,900,000
2. Production Cost				2,605,500			2,442,050			2,259,700
2.1 Labour	man day	13,500	85	1,147,500	13,500	80	1,080,000	13,500	75	1,012,500
2.2 Input				1,093,900			1,020,750			929,600
- Seed	kg	1,800	130	234,000	1,800	130	234,000	1,800	120	216,000
- Manure	kg	63	500	31,500	63	450	28,350	63	400	25,200
- Nitrogen	kg	2,260	130	293,800	2,260	120	271,200	2,260	110	248,600
- Phosphate	kg	2,690	90	242,100	2,690	80	215,200	2,690	70	188,300
- Potassium	kg	2,050	90	184,500	2,050	80	164,000	2,050	70	143,500
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	3	108,000
2.3 Machinery	hrs	15,000	16	240,000	15,000	15	225,000	15,000	14	210,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			124,100			116,300			107,600
3. Net Income				3,519,500			3,157,950			2,640,300

	Unit	Rainfed Maize			Rainfed Groundnuts			Rainfed Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,600	1,400	2,240,000	3,100	900	2,790,000	3,530	700	2,471,000
2. Production Cost				1,400,315			1,574,252			1,819,078
2.1 Labour	man day	13,500	40	540,000	13,500	50	675,000	13,500	65	877,500
2.2 Input				643,615			674,252			704,978
- Seed	kg	2,000	140	280,000	2,100	120	252,000	2,200	150	330,000
- Manure	kg	63	5	315	63	4	252	63	6	378
- Nitrogen	kg	2,260	70	158,200	2,260	50	113,000	2,260	50	113,000
- Phosphate	kg	2,690	40	107,600	2,690	50	134,500	2,690	40	107,600
- Potassium	kg	2,050	30	61,500	2,050	50	102,500	2,050	40	82,000
- Chemicals	lit	36,000	1	36,000	36,000	2	72,000	36,000	2	72,000
2.3 Machinery	hrs	15,000	10	150,000	15,000	10	150,000	15,000	10	150,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			66,700			75,000			86,600
3. Net Income				839,685			1,215,748			651,922

	Unit	Rainfed Tobacco			Irrigated Sugarcane (average annual cost)			Rainfed Cassava		
		Price (VDN)	Q'ty	Amount (VDN/ha)	Price (VDN)	Q'ty	Amount (VDN/ha)	Price (VDN)	Q'ty	Amount (VDN/ha)
1. Gross Income	kg	5,760	980	5,644,800	210	34,070	7,154,700	207	7,000	1,449,000
2. Production Cost				3,869,404			5,446,530			1,137,430
2.1 Labour	man day	13,500	180	2,430,000	13,500	170	2,295,000	15,000	35	525,000
2.2 Input				1,030,104			2,622,130			483,230
- Seed	kg	3,200	150	480,000	450	4,500	2,025,000	50	7,500	375,000
- Manure	kg	63	8	504	63	10	630	63	10	630
- Nitrogen	kg	2,260	120	271,200	2,260	100	226,000	2,260	0	0
- Phosphate	kg	2,690	10	26,900	2,690	50	134,500	2,690	40	107,600
- Potassium	kg	2,050	70	143,500	2,050	80	164,000	2,050	0	0
- Chemicals	lit	36,000	3	108,000	36,000	2	72,000	36,000	0	0
2.3 Machinery	hrs	15,000	15	225,000	15,000	18	270,000	15,000	5	75,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			184,300			259,400			54,200
3. Net Income				1,775,396			1,708,170			311,570

Table N.25 Economic Crop Budget under With-Project

	Unit	Irrigated Winter-Spring Paddy			Irrigated Summer-Autumn Paddy			Irrigated 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,750	5,500	9,625,000	1,750	4,800	8,400,000	1,750	4,300	7,525,000
2. Production Cost				3,774,300			3,512,600			3,371,300
2.1 Labour	man day	13,500	100	1,350,000	13,500	100	1,350,000	13,500	100	1,350,000
2.2 Input				1,424,600			1,260,300			1,190,800
- Seed	kg	1,800	150	270,000	1,800	140	252,000	1,800	130	234,000
- Manure	kg	63	700	44,100	63	600	37,800	63	500	31,500
- Nitrogen	kg	2,260	180	406,800	2,260	160	361,600	2,260	140	316,400
- Phosphate	kg	2,690	130	349,700	2,690	110	295,900	2,690	110	295,900
- Potassium	kg	2,050	120	246,000	2,050	100	205,000	2,050	100	205,000
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	3	108,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	17	255,000	15,000	16	240,000
2.4 Irrigation	6%			577,500			504,000			451,500
2.5 Others	5%			152,200			143,300			139,000
3. Net Income				5,850,700			4,887,400			4,153,700

	Unit	Irrigated Maize			Irrigated Groundnuts			Irrigated Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,600	4,500	7,200,000	3,100	2,000	6,200,000	3,530	1,800	6,354,000
2. Production Cost				2,856,678			2,563,141			2,755,330
2.1 Labour	man day	13,500	70	945,000	13,500	70	945,000	13,500	80	1,080,000
2.2 Input				1,184,178			961,841			1,001,030
- Seed	kg	2,000	160	320,000	2,100	170	357,000	2,200	180	396,000
- Manure	kg	63	6	378	63	7	441	63	10	630
- Nitrogen	kg	2,260	140	316,400	2,260	70	158,200	2,260	70	158,200
- Phosphate	kg	2,690	110	295,900	2,690	80	215,200	2,690	80	215,200
- Potassium	kg	2,050	70	143,500	2,050	60	123,000	2,050	60	123,000
- Chemicals	lit	36,000	3	108,000	36,000	3	108,000	36,000	3	108,000
2.3 Machinery	hrs	15,000	12	180,000	15,000	12	180,000	15,000	12	180,000
2.4 Irrigation	6%			432,000			372,000			381,200
2.5 Others	5%			115,500			104,300			113,100
3. Net Income				4,343,322			3,636,859			3,598,670

	Unit	Irrigated Tobacco			Irrigated Sugarcane (average annual cost)			Irrigated Pineapple (average annual cost)		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	5,760	1,700	9,792,000	210	60,000	12,600,000	675	20,000	13,500,000
2. Production Cost				5,879,830			7,611,393			7,322,900
2.1 Labour	man day	13,500	250	3,375,000	13,500	230	3,105,000	13,500	260	3,510,000
2.2 Input				1,395,330			3,138,993			3,280,600
- Seed	kg	3,200	180	576,000	450	5,000	2,250,000	50	26,000	1,300,000
- Manure	kg	63	10	630	63	11	693	63	0	0
- Nitrogen	kg	2,260	180	406,800	2,260	190	429,400	2,260	260	587,600
- Phosphate	kg	2,690	10	26,900	2,690	60	161,400	2,690	125	336,250
- Potassium	kg	2,050	100	205,000	2,050	110	225,500	2,050	375	768,750
- Chemicals	lit	36,000	5	180,000	36,000	2	72,000	36,000	8	288,000
2.3 Machinery	hrs	15,000	18	270,000	15,000	19	285,000	15,000	10	150,000
2.4 Irrigation	6%			587,500			756,000			35,300
2.5 Others	5%			252,000			326,400			347,000
3. Net Income				3,912,170			4,988,607			6,177,100

Table N.26 Summary of Economic Crop Budget

Crops	Without Project					With Project					Increment		
	Unit Yield	Gross income	Production Cost	Net Income		Unit Yield	Gross income	Production Cost	Net Income		Unit Yield	Net Income	
	ton/ha	VND/ha	VND/ha	VND/ha	US\$/ha	ton/ha	VND/ha	VND/ha	VND/ha	US\$/ha	ton/ha	VND/ha	US\$/ha
Irrigated Crops													
1. Paddy (winter-spring)	5.00	8,750,000	3,628,800	5,121,200	339.9	5.50	9,625,000	3,774,300	5,850,700	388.3	0.50	729,500	48.4
2. Paddy (summer-autumn)	4.40	7,700,000	3,374,900	4,325,100	287.0	4.80	8,400,000	3,512,600	4,887,400	324.4	0.40	562,300	37.3
3. Paddy (3rd crop)	3.40	5,950,000	3,146,000	2,804,000	186.1	4.30	7,525,000	3,371,300	4,153,700	275.7	0.90	1,349,700	89.6
4. Maize	3.50	5,600,000	2,547,300	3,052,700	202.6	4.50	7,200,000	2,856,700	4,343,300	288.2	1.00	1,290,600	85.7
5. Groundnuts	1.50	4,650,000	2,401,100	2,248,900	149.3	2.00	6,200,000	2,563,100	3,636,900	241.4	0.50	1,388,000	92.1
6. Soybeans	1.20	4,236,000	2,559,000	1,677,000	111.3	1.80	6,354,000	2,755,300	3,598,700	238.8	0.60	1,921,700	127.5
7. Tobacco	1.51	8,697,600	5,814,200	2,883,400	191.4	1.70	9,792,000	5,879,800	3,912,200	259.6	0.19	1,028,800	68.3
8. Sugarcane	49.70	10,437,000	7,136,400	3,300,600	219.0	60.00	12,600,000	7,611,400	4,988,600	331.1	10.30	1,688,000	112.0
9. Pineapple	0.00	0	0	0	0.0	20.00	13,500,000	7,322,900	6,177,100	409.9	20.00	6,177,100	409.9
Rainfed Crops													
1. Paddy (winter-spring)	3.50	6,125,000	2,605,500	3,519,500	233.6						2.0	2,331,200	154.7
2. Paddy (summer-autumn)	3.20	5,600,000	2,442,100	3,157,900	209.6						1.6	1,729,500	114.8
3. Paddy (3rd crop)	2.80	4,900,000	2,259,700	2,640,300	175.2						1.5	1,513,400	100.4
4. Maize	1.40	2,240,000	1,400,300	839,700	55.7						3.1	3,503,600	232.5
5. Groundnuts	0.90	2,790,000	1,574,300	1,215,700	80.7						1.1	2,421,200	160.7
6. Soybeans	0.70	2,471,000	1,819,100	651,900	43.3						1.1	2,946,800	195.6
7. Tobacco	0.98	5,644,800	3,869,400	1,775,400	117.8						0.7	2,136,800	141.8
8. Sugarcane	34.07	7,154,700	5,446,500	1,708,200	113.4						25.9	3,280,400	217.7
9. Cassava	7.00	1,449,000	1,137,400	311,600	20.7						-7.0	-311,600	-20.7

Note: Exchange Rate: US\$1.00 = VND15,068

Table N.27 Incremental Benefit

	Without-Project			Year 2020 with-Project			Increment Benefit 10 ³ US\$
	Area	Net Income	Total	Area	Net Income	Total	
	ha	US\$/ha	10 ³ US\$	ha	US\$/ha	10 ³ US\$	
Irrigated Area	15,700			37,300			
1. Paddy (Winter-Spring)	15,700	340	5,336	28,600	388	11,105	-
2. Paddy (Summer-Autum)	12,100	287	3,473	19,100	324	6,195	-
3. Paddy (3rd Crop)	3,500	186	651	13,100	276	3,611	-
4. Maize	1,000	203	203	12,700	288	3,661	-
5. Groundnuts/ Soybeans	800	130	104	7,600	241	1,834	-
6. Tobacco	0	191	0	400	260	104	-
7. Sugarcane	0	219	0	3,000	331	993	-
8. Pineapple	0	0	0	300	410	123	-
	33,100	620	9,767	84,800	740	27,627	17,859
Rainfed Area	21,700			0			
1. Paddy (Winter-Spring)	9,000	234	2,102	-	-	-	-
2. Paddy (Summer-Autum)	0	210	0	-	-	-	-
3. Paddy (3rd Crop)	0	175	0	-	-	-	-
4. Maize	7,200	56	401	-	-	-	-
5. Groundnuts/ Soybeans	3,700	62	229	-	-	-	-
6. Tobacco	200	118	24	-	-	-	-
7. Sugarcane	4,000	113	454	-	-	-	-
8. Cassava	4,600	21	95	-	-	-	-
	28,700	150	3,305	0			-3,305
Net Total Area	37,400			37,300			
Total	61,800		13,072	84,800		27,627	14,554
	(net production value \$ per ha)		\$349.5			\$740.7	\$390.2

	Without			Year 2010 with Project			Increment Benefit 10 ³ US\$
	Area	Net Income	Total	Area	Net Income	Total	
	ha	US\$/ha	10 ³ US\$	ha	US\$/ha	10 ³ US\$	
Irrigated Area	15,700			32,800			
1. Paddy	15,700	340	5,340	24,840	388	9,650	
2. Paddy (Summer-Autum)	12,100	287	3,470	14,550	324	4,720	
3. Paddy (3rd Crop)	3,500	186	650	19,170	276	5,280	
4. Maize	1,000	203	200	9,100	288	2,620	
5. Groundnuts/ Soybeans	800	130	100	11,860	241	2,860	
6. Tobacco	0	191	0	260	260	70	
7. Sugarcane	0	219	0	260	331	90	
8. Pineapple	0	0	0	1,940	410	800	
	33,100	620	9,760	81,980	800	26,090	16,330
Rainfed Area	17,100						
1. Paddy (Winter-Spring)	7,090	234	1,660	0	234	0	
2. Paddy (Summer-Autum)	0	210	0	0	210	0	
3. Paddy (3rd Crop)	0	175	0	0	175	0	
4. Maize	5,670	56	320	0	56	0	
5. Groundnuts/ Soybeans	2,920	62	180	0	62	0	
6. Tobacco	160	118	20	0	118	0	
7. Sugarcane	3,150	113	360	0	113	0	
8. Cassava	3,620	21	70	0	21	0	
	22,610	150	2,610	0		0	-2,610
Net Total Area	32,800			32,800			
Total	55,710		12,370	81,980		26,090	13,720
	(net production value \$ per ha)		\$377.1			\$795.4	\$418.3

Table N.28 Estimation of Livestock Benefit

	Unit	*4 2001	*5 2005	*5 2010	2020
I. Cattle, Buffalo, Pig and Goat					
1. Buffalo & Cattle					
Province	head	213,200	270,000	320,000	409,000
Proportion in the Project Area	*1	9%	10%	10%	10%
Project Area	*1 head	19,600	27,000	32,000	40,900
2. Pig					
Province	head	545,200	500,000	600,000	780,000
Proportion in the Project Area	*1	13%	15%	15%	15%
Project Area	*1 head	71,000	75,000	90,000	117,000
Cattle Equivalent	*2 head	17,000	18,000	21,600	28,100
3. Goat					
Province	head	13,300	7,500	10,000	17,000
Proportion in the Project Area	*1	7%	15%	15%	15%
Project Area	*1 head	970	1,100	1,500	2,600
Cattle Equivalent	*2 head	100	100	100	200
4. Total Cattle Equivalent					
Province	head	345,200	390,700	464,900	597,700
Project Area	*1 head	36,700	45,100	53,700	69,200
5. Production Value *1					
Domestic	milli. VND	247,085	-	-	-
Other	milli. VND	4,528	-	-	-
Non-Meat	milli. VND	81,409	-	-	-
Other Products	milli. VND	25,163	-	-	-
Total	milli. VND	358,185	-	-	-
6. Unit Value per head	VND	1,038,000	1,038,000	1,038,000	1,038,000
7. Gross Production Value by Project	milli. VND	38,100	46,800	55,700	71,800
8. Production Cost *3	milli. VND	31,600	38,800	46,200	59,600
9. Net Production Value	milli. VND	6,500	8,000	9,500	12,200
II. Poultry					
1. Whole Province	head	3,520,000	7,500,000	10,000,000	15,000,000
2. Proportion in the Project Area		13%	15%	15%	15%
3. Project Area	head	458,000	1,125,000	1,500,000	2,250,000
4. Production Value	milli. VND	33,400			
5. Unit Value per head	VND	9,500	9,500	9,500	9,500
6. Gross Production Value by Project	milli. VND	4,400	10,700	14,300	21,400
7. Production Cost *3	milli. VND	3,700	9,100	12,200	18,200
8. Net Production Value	milli. VND	700	1,600	2,100	3,200
III. Incremental Benefit					
1. Total Net Production Value	milli. VND	7,200	9,600	11,600	15,400
2. Incremental Net Value	milli. VND	-	2,400	4,400	8,200
Expressed in US\$	US\$	-	159,000	292,000	544,000
3. Economic Value (90%)	US\$	-	143,000	263,000	490,000

Note *1: Water supply for livestock covering only 2 districts of Qui Nhon & Tuy Phuoc.

*2: Conversion on weight basis, 150 kg for pig, 500 kg for cattle, and 45 kg for goat weight.

*3: Production cost assumed to be 83% for cattle and 85% for poultry.

*4: Number of head in 2001 by Statistical Yearbook 2001, Binh Dinh Province

*5: Number of heads in 2005 and 2010 quoted from Development Plan of Province.

Table N.29 Estimation of Aquaculture Benefit

		Unit	1995	1999	2000	2001	2005	2010	2020
I. Area under Shrimp Aquaculture									
1. Shrimp Aquaculture Area in the Whole Province	*1	ha	1,424	2,002	2,443	2,609	-	-	-
2. Shrimp Aquaculture Area in the Project Area	*2	ha	-	-	1,543	-	-	-	-
3. Proportion in the Project Area	*3	%	-	-	63%	63%	63%	63%	-
4. Projection in the Development Plan in the Province	*4	ha	-	-	-	-	3,045	4,019	-
5. Projection in the Project Area	*5	ha	-	-	-	1,600	1,900	2,500	3,400
II. Production Value									
1. Total Production Value in the Province	*1	Milli. VND	25,125	49,698	93,513	100,890			
2. Unit Production Value per ha		Milli. VND/ha	17.64	24.82	38.28	38.67	38.67	38.67	38.67
3. Production Value in the Project Area		Milli. VND	-	-	59,070	61,870	73,470	96,680	131,480
4. Production Cost		Milli. VND	-	-	-	30,930	36,730	48,330	65,730
5. Net Production Value		Milli. VND	-	-	-	30,940	36,740	48,350	65,750
III. Production Value									
1. Increment of Net Production Value from 2001		Milli. VND	-	-	-	-	5,800	17,410	34,810
2. Expressed in US\$ (US\$1 = VND15,068)		Milli. US\$					\$0.38	\$1.16	\$2.31
3. Economic Value (90%)		Milli. US\$					\$0.34	\$1.04	\$2.08

Note: *1: Statistical Yearbook 2001, Binh Dinh Province.
*2: Feasibility Report, May 2000, HEC-1.
*3: Same proportion is assumed in the future.
*4: Agriculture and Rural Development Plan 2001 to 2010, DARD, Binh Dinh Province.
*5: 2,500 ha is assumed as the maximum area.

Table N.30 Benefit accrued from Agriculture Sector in the Feasibility Study

(1) Irrigation Area (unit: ha)

Construction Complete	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
in 2007	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400
in 2008	-	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
in 2009	-	-	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600
in 2010	-	-	-	500	500	500	500	500	500	500	500	500	500	500	500	500
in 2011	-	-	-	-	19,900	19,900	19,900	19,900	19,900	19,900	19,900	19,900	19,900	19,900	19,900	19,900
in 2012	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
in 2013	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0
in 2014	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0
in 2015	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
in 2016	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
in 2017	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
in 2018	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
in 2019	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Accumulation	3,400	9,400	17,000	17,500	37,400	37,400	37,400	37,400	37,400	37,400	37,400	37,400	37,400	37,400	37,400	37,400

(2) Irrigation Benefit (unit: thousand US\$)

Bebefit Accrued from	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
in the year of 2008	-	504	648	720	720	720	720	720	720	720	720	720	720	720	720	720
in the year of 2009	-	-	1,319	1,695	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884	1,884
in the year of 2010	-	-	-	1,904	2,448	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720
in the year of 2011	-	-	-	-	85	109	121	121	121	121	121	121	121	121	121	121
in the year of 2012	-	-	-	-	-	6,361	8,363	9,107	9,107	9,107	9,107	9,107	9,107	9,107	9,107	9,107
in the year of 2013	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0
in the year of 2014	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0
in the year of 2015	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
in the year of 2016	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
in the year of 2017	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
in the year of 2018	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
in the year of 2019	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
in the year of 2020	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Accumulation	0	504	1,967	4,319	5,137	11,794	13,808	14,552	14,552	14,552	14,552	14,552	14,552	14,552	14,552	14,552

(3) Total Benefit from Irrigation, Livestock and Aquaculture (unit: thousand US\$)

Sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Irrigation	-	504	1,967	4,319	5,137	11,794	13,808	14,552	14,552	14,552	14,552	14,552	14,552	14,552	14,552	14,552
Livestock	-	-	123	260	368	490	490	490	490	490	490	490	490	490	490	490
Aquaculture	-	-	-	-	1,040	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Total	-	504	2,090	4,579	6,545	14,364	16,378	17,122	17,122	17,122	17,122	17,122	17,122	17,122	17,122	17,122

Table N.31 Estimation of Probable Flood Damage in Downstream Area of Kone River Basin in 2001

(1/2)

5% Late Flood - Without Project (Condition in 2001)

No.	Blk No.	Name of commune	Elevation (m)	House (nos)	Farmland (ha)	Damageable Value		Flood Water Level		Average Inundation		Damage Rates		Flood Damage (VND million)		
						House (VND mil)	Farmland (VND mil)	Overland (m)	Inundation (m)	Farmland (m)	House (m)	Farmland	House	Agriculture (for calculation only)	House	Total
TOTAL				32,639	4,894	391,668	29,366							9,255	5,792	15,047
1	a06	Nhon My	13.4	170	39	2,040	232	0.6		0.6	0.6	0.3000	0.0025	69.5	5.1	75
2	a07	Nhon Phuc	11.4	254	44	3,048	264	0.6		0.6	0.6	0.3000	0.0025	79.2	7.6	87
3	b06	Nhon My	12.5	170	39	2,040	232	0.6		0.6	0.6	0.3000	0.0025	69.5	5.1	75
4	b07	Nhon My	11.4	170	39	2,040	232	0.6		0.6	0.6	0.3000	0.0025	69.5	5.1	75
5	b08	Nhon Khanh	11.8	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
6	c06	Nhon My	10.7	170	39	2,040	232	0.6		0.6	0.6	0.3000	0.0025	69.5	5.1	75
7	c07	Nhon Khanh	11.2	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
8	c08	Nhon Khanh	11.3	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
9	c09	Nhon Loc	10.8	176	49	2,112	292	0.6		0.6	0.6	0.3000	0.0025	87.7	5.3	93
10	d07	Nhon Hau	10.1	249	28	2,988	170	0.6		0.6	0.6	0.3000	0.0025	51.1	7.5	59
11	d08	Nhon Khanh	10.4	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
12	d09	Nhon Khanh	10.5	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
13	e07	Nhon Hau	10.3	249	28	2,988	170	0.6		0.6	0.6	0.3000	0.0025	51.1	7.5	59
14	e08	Nhon Khanh	10.5	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
15	e09	Nhon Khanh	9.8	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
16	e10	Nhon Loc	9.2	176	49	2,112	292	0.6		0.6	0.6	0.3000	0.0025	87.7	5.3	93
17	f07	Nhon Hau	9.7	249	28	2,988	170	0.6		0.6	0.6	0.3000	0.0025	51.1	7.5	59
18	f08	Nhon Khanh	9.4	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
19	f09	Nhon Khanh	8.2	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
20	f10	Nhon Hoa	8.5	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
21	f11	Nhon Hoa	8.7	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
22	g06	Nhon Hung	10.2	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
23	g07	Nhon Hung	8.3	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
24	g08	Nhon Khanh	9.4	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
25	g09	Nhon Khanh	8	247	44	2,964	266	0.6		0.6	0.6	0.3000	0.0025	79.7	7.4	87
26	g10	Nhon Hoa	8.4	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
27	g11	Nhon Hoa	7.5	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
28	h04	Dap Da	6.2	761	1	9,132	4	0.6		0.6	0.6	0.3000	0.0025	1.3	22.8	24
29	h05	Nhon An	7.4	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
30	h06	Nhon Hung	7.3	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
31	h07	Nhon Hung	7.5	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
32	h08	Nhon Hung	8.2	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
33	h09	Binh Dinh	7.2	668	42	8,016	253	0.6		0.6	0.6	0.3000	0.0025	75.8	20.0	96
34	h10	Nhon Hoa	7.4	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
35	i04	Nhon An	6.2	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
36	i05	Nhon An	6.2	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
37	i06	Nhon An	6.2	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
38	i07	Nhon Hung	6.8	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
39	i08	Nhon Hung	8.5	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
40	i09	Binh Dinh	7.2	668	42	8,016	253	0.6		0.6	0.6	0.3000	0.0025	75.8	20.0	96
41	i10	Nhon Hoa	7.2	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
42	j03	Nhon Thanh	6.1	274	24	3,288	146	0.6		0.6	0.6	0.3000	0.0025	43.7	8.2	52
43	j04	Nhon Phong	6.2	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
44	j05	Nhon Phong	5.6	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
45	j06	Nhon An	5.6	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
46	j07	Nhon Hung	6.2	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
47	j08	Nhon Hung	6	326	48	3,912	289	0.6		0.6	0.6	0.3000	0.0025	86.8	9.8	97
48	j09	Binh Dinh	6.5	668	42	8,016	253	0.6		0.6	0.6	0.3000	0.0025	75.8	20.0	96
49	j10	Binh Dinh	6.6	668	42	8,016	253	0.6		0.6	0.6	0.3000	0.0025	75.8	20.0	96
50	k02	Cat Nhon	4.7	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
51	k03	Cat Nhon	4.7	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
52	k04	Nhon Phong	6.4	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
53	k05	Nhon Phong	5.2	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
54	k06	Nhon An	5.1	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
55	k07	Phuoc Hung	6.1	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
56	k08	Phuoc Hung	5.8	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
57	k09	Phuoc Hung	6	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
58	k10	Nhon Hoa	5.7	144	24	1,728	145	0.6		0.6	0.6	0.3000	0.0025	43.4	4.3	48
59	l02	Cat Nhon	3	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
60	l03	Nhon Phong	5.6	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
61	l04	Nhon Phong	5.4	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
62	l05	Nhon Phong	4.4	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
63	l06	Nhon An	4.6	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
64	l07	Phuoc Hung	5.3	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
65	l08	Phuoc Hung	5.5	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
66	l09	Phuoc Quang	5	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
67	l10	Phuoc Quang	4.8	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
68	m01	Cat Nhon	2	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
69	m02	Cat Nhon	3.7	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
70	m03	Nhon Phong	4.4	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
71	m04	Nhon Phong	4.3	244	34	2,928	206	0.6		0.6	0.6	0.3000	0.0025	61.9	7.3	69
72	m05	Nhon Hanh	4.3	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
73	m06	Nhon An	4.5	247	60	2,964	359	0.6		0.6	0.6	0.3000	0.0025	107.6	7.4	115
74	m07	Phuoc Hung	4.4	291	65											

Table N.31 Estimation of Probable Flood Damage in Downstream Area of Kone River Basin in 2001

(2/2)

5% Late Flood - Without Project (Condition in 2001)

No.	Blk No.	Name of commune	Elevation (m)	House (nos)	Farmland (ha)	Damageable Value		Flood Water Level		Average Inundation		Damage Rates		Flood Damage (VND million)		
						House (VND mil)	Farmland (VND mil)	Overland (m)	Inundation (m)	Farmland (m)	House (m)	House	Farmland	Agriculture (for calculation only)	House	Total
TOTAL				32,639	4,894	391,668	29,366							9,255	5,792	15,047
87	o01	Cat Nhon	2.1	60	10	720	60	0.6		0.6	0.6	0.3000	0.0025	18.0	1.8	20
88	o02	Nhon Hanh	3.1	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
89	o03	Nhon Hanh	2.5	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
90	o04	Nhon Hanh	3.5	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
91	o05	Nhon Hanh	2.9	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
92	o06	Phuoc Hung	3.2	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
93	o07	Phuoc Hung	3.4	291	65	3,492	390	0.6		0.6	0.6	0.3000	0.0025	117.0	8.7	126
94	o08	Phuoc Quang	3	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
95	o09	Phuoc Hiep	3.7	233	34	2,796	205	0.6		0.6	0.6	0.3000	0.0025	61.6	7.0	69
96	p02	Cat Thang	2.4	216	2	2,592	14	0.6		0.6	0.6	0.3000	0.0025	4.1	6.5	11
97	p03	Nhon Hanh	2.7	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
98	p04	Nhon Hanh	2.4	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
99	p05	Nhon Hanh	2.8	238	64	2,856	381	0.6		0.6	0.6	0.3000	0.0025	114.3	7.1	121
100	p06	Phuoc Hung	2	291	65	3,492	390	0.6	2.0	0.6	0.6	0.3000	0.0025	117.0	8.7	126
101	p07	Phuoc Quang	2.5	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
102	p08	Phuoc Quang	2.4	265	51	3,180	305	0.6		0.6	0.6	0.3000	0.0025	91.6	8.0	100
103	p09	Phuoc Hoa	3.1	167	4	2,004	26	0.6		0.6	0.6	0.3000	0.0025	7.7	5.0	13
104	q02	Cat Thang	1.8	216	2	2,592	14	0.6	2.0	0.6	0.6	0.3000	0.0025	4.1	6.5	11
105	q03	Cat Thang	1.5	216	2	2,592	14	0.6	2.0	0.6	0.6	0.3000	0.0025	4.1	6.5	11
106	q04	Phuoc Thang	1.4	163	11	1,956	65	0.6	2.0	0.6	0.6	0.3000	0.0025	19.6	4.9	25
107	q05	Nhon Hanh	1.7	238	64	2,856	381	0.6	2.0	0.6	0.6	0.3000	0.0025	114.3	7.1	121
108	q06	Phuoc Thang	1.6	163	11	1,956	65	0.6	2.0	0.6	0.6	0.3000	0.0025	19.6	4.9	25
109	q07	Phuoc Quang	1.2	265	51	3,180	305	0.6	2.0	0.8	0.8	0.3000	0.0050	91.6	15.9	108
110	q08	Phuoc Hoa	2	167	4	2,004	26	0.6	2.0	0.6	0.6	0.3000	0.0025	7.7	5.0	13
111	q09	Phuoc Hiep	2	233	34	2,796	205	0.6	2.0	0.6	0.6	0.3000	0.0025	61.6	7.0	69
112	r02	Cat Thang	1.2	216	2	2,592	14	0.6	2.0	0.8	0.8	0.3000	0.0050	4.1	13.0	17
113	r03	Cat Thang	1.1	216	2	2,592	14	0.6	2.0	0.9	0.9	0.3000	0.0075	4.1	19.4	24
114	r04	Phuoc Thang	0.6	163	11	1,956	65	0.6	2.0	1.4	1.4	0.5800	0.0600	37.9	117.4	155
115	r05	Phuoc Thang	0.9	163	11	1,956	65	0.6	2.0	1.1	1.1	0.3700	0.0100	24.2	19.6	44
116	r06	Phuoc Thang	1.6	163	11	1,956	65	0.6	2.0	0.6	0.6	0.3000	0.0025	19.6	4.9	25
117	r07	Phuoc Hoa	1.1	167	4	2,004	26	0.6	2.0	0.9	0.9	0.3000	0.0075	7.7	15.0	23
118	r08	Phuoc Hoa	1.4	167	4	2,004	26	0.6	2.0	0.6	0.6	0.3000	0.0025	7.7	5.0	13
119	r09	Phuoc Son	1.8	194	22	2,328	130	0.6	2.0	0.6	0.6	0.3000	0.0025	39.1	5.8	45
120	s02	Cat Tien	0.7	127	0	1,524	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	19.1	19
121	s03	Cat Chanh	0.7	124	0	1,488	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	18.6	19
122	s04	Cat Chanh	0.7	124	0	1,488	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	18.6	19
123	s05	Phuoc Thang	0.5	163	11	1,956	65	0.6	2.0	1.5	1.5	0.6500	0.0625	42.5	122.3	165
124	s06	Phuoc Thang	0.8	163	11	1,956	65	0.6	2.0	1.2	1.2	0.4400	0.0100	28.8	19.6	48
125	s07	Phuoc Hoa	0.5	167	4	2,004	26	0.6	2.0	1.5	1.5	0.6500	0.0625	16.8	125.3	142
126	s08	Phuoc Hoa	0.6	167	4	2,004	26	0.6	2.0	1.4	1.4	0.5800	0.0600	15.0	120.2	135
127	s09	Phuoc Son	0.9	194	22	2,328	130	0.6	2.0	1.1	1.1	0.3700	0.0100	48.2	23.3	71
128	t03	Cat Chanh	0.7	124	0	1,488	0	0.6	2.0	1.3	1.3	0.5100	0.0125	0.0	18.6	19
129	t04	Cat Chanh	0.3	124	0	1,488	0	0.6	2.0	1.7	1.7	0.7900	0.1125	0.0	167.4	167
130	t05	Cat Chanh	0.2	124	0	1,488	0	0.6	2.0	1.8	1.8	0.8600	0.1600	0.0	238.1	238
131	t06	Phuoc Thang	0.2	163	11	1,956	65	0.6	2.0	1.8	1.8	0.8600	0.1600	56.2	313.0	369
132	t07	Phuoc Hoa	0.3	167	4	2,004	26	0.6	2.0	1.7	1.7	0.7900	0.1125	20.4	225.5	246
133	t08	Phuoc Hoa	0.4	167	4	2,004	26	0.6	2.0	1.6	1.6	0.7200	0.1100	18.6	220.4	239
134	t09	Phuoc Son	0.3	194	22	2,328	130	0.6	2.0	1.7	1.7	0.7900	0.1125	102.9	261.9	365
135	u03	Cat Tien	0.2	127	0	1,524	0	0.6	2.0	1.8	1.8	0.8600	0.1600	0.0	243.8	244
136	u04	Cat Chanh	0.2	124	0	1,488	0	0.6	2.0	1.8	1.8	0.8600	0.1600	0.0	238.1	238
137	u05	Phuoc Thang	-0.2	163	11	1,956	65	0.6	2.0	2.2	2.2	1.0000	0.2600	65.4	508.6	574
138	u06	Phuoc Thang	-0.2	163	11	1,956	65	0.6	2.0	2.2	2.2	1.0000	0.2600	65.4	508.6	574
139	u07	Phuoc Thang	-0.2	163	11	1,956	65	0.6	2.0	2.2	2.2	1.0000	0.2600	65.4	508.6	574
140	u08	Phuoc Hoa	0.3	167	4	2,004	26	0.6	2.0	1.7	1.7	0.7900	0.1125	20.4	225.5	246
141	u09	Phuoc Son	-0.2	194	22	2,328	130	0.6	2.0	2.2	2.2	1.0000	0.2600	130.2	605.3	735

Table N.32 Estimation of Flood Damage in Midstream Area of Kone River Basin in 2001

5% Late Flood - Without Project (Condition in 2001)

No.	Blk No.	Name of commune	Block area (km ²)	Average elevation (m)	House (nos)	Farmland (ha)	Damageable Value		Flood Water Level		Average Inundation		Damage Rates		Flood Damage (VND million)		
							House (VND mil)	Farmland (VND mil)	Overland (m)	Inundation (m)	Farmland (m)	House (m)	Farmland	House	Agriculture (for calculation only)	House	Total
TOTAL					10,976	2,342	115,526	12,379							5,373	14,682	20,055
1	V02	Binh Tuong	0.6	27.4	67	13	482	47	0.0	24.6	0.0	0.0	0.0000	0.0000	0.0	0.0	0
2	V03	Binh Tuong	1	28.3	67	13	804	79	0.0	24.6	0.0	0.0	0.0000	0.0000	0.0	0.0	0
3	W02	Binh Tuong	0.2	29.3	67	13	161	16	0.0	24.1	0.0	0.0	0.0000	0.0000	0.0	0.0	0
4	W03	Binh Tuong	0.9	24.5	67	13	724	71	0.0	24.1	0.0	0.0	0.0000	0.0000	0.0	0.0	0
5	X02	Binh Thanh	0.8	25.0	59	7	566	35	0.0	24.1	0.0	0.0	0.0000	0.0000	0.0	0.0	0
6	X03	Binh Tuong	0.3	23.5	67	13	241	24	0.0	23.5	0.0	0.0	0.0000	0.0000	0.0	0.0	0
7	X04	Binh Tuong	1	22.5	67	13	804	79	0.0	23.5	1.0	1.0	0.3000	0.0100	23.6	8.0	32
8	Y03	Binh Thanh	0.7	24.0	59	7	496	30	0.0	22.8	0.0	0.0	0.0000	0.0000	0.0	0.0	0
9	Y04	Binh Tuong	0.6	22.0	67	13	482	47	0.0	22.3	0.3	0.3	0.2100	0.0025	9.9	1.2	11
10	Z03	Binh Thanh	1	23.5	59	7	708	43	0.0	22.3	0.0	0.0	0.0000	0.0000	0.0	0.0	0
11	Z04	Binh Thanh	0.6	22.3	59	7	425	26	0.0	21.5	0.0	0.0	0.0000	0.0000	0.0	0.0	0
12	Z05	Binh Tuong	0.8	22.0	67	13	643	63	0.0	21.5	0.0	0.0	0.0000	0.0000	0.0	0.0	0
13	A03	TT Phu Phong	1	22.0	203	12	2,436	70	0.0	21.5	0.0	0.0	0.0000	0.0000	0.0	0.0	0
14	A04	TT Phu Phong	1	22.0	157	12	1,884	70	0.0	20.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
15	A05	TT Phu Phong	0.7	22.0	157	12	1,319	49	0.0	20.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
16	B03	Binh Thanh	1	22.0	46	7	552	43	0.0	20.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
17	B04	Binh Thanh	0.8	21.5	46	7	442	35	0.0	20.3	0.0	0.0	0.0000	0.0000	0.0	0.0	0
18	B05	Tay Xuan	0.4	21.5	47	6	226	14	0.0	20.3	0.0	0.0	0.0000	0.0000	0.0	0.0	0
19	C03	Binh Thanh	1	22.0	46	7	552	43	0.0	20.3	0.0	0.0	0.0000	0.0000	0.0	0.0	0
20	C04	Binh Thanh	1	22.0	46	7	552	43	0.0	20.3	0.0	0.0	0.0000	0.0000	0.0	0.0	0
21	C05	Tay Xuan	0.2	20.0	47	6	113	7	0.0	19.8	0.0	0.0	0.0000	0.0000	0.0	0.0	0
22	C06	Tay Xuan	0.9	20.0	47	6	508	32	0.0	19.8	0.0	0.0	0.0000	0.0000	0.0	0.0	0
23	D03	Binh Thanh	1	22.0	46	7	552	43	0.0	20.3	0.0	0.0	0.0000	0.0000	0.0	0.0	0
24	D04	Binh Hoa	1	21.0	142	36	1,704	216	0.0	19.8	0.0	0.0	0.0000	0.0000	0.0	0.0	0
25	D05	Binh Hoa	0.4	22.0	142	36	682	86	0.0	19.6	0.0	0.0	0.0000	0.0000	0.0	0.0	0
26	D06	Tay Xuan	0.7	21.0	47	6	395	25	0.0	19.6	0.0	0.0	0.0000	0.0000	0.0	0.0	0
27	E03	Binh Thanh	1	21.0	46	7	552	43	0.0	19.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
28	E04	Binh Hoa	1	21.0	142	36	1,704	216	0.0	19.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
29	E05	Binh Hoa	0.3	21.5	142	36	511	65	0.0	19.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
30	E06	Tay Xuan	0.6	20.5	47	6	338	22	0.0	19.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
31	F03	Binh Hoa	1	22.0	142	36	1,704	216	0.0	18.7	0.0	0.0	0.0000	0.0000	0.0	0.0	0
32	F04	Binh Hoa	1	21.0	142	36	1,704	216	0.0	18.7	0.0	0.0	0.0000	0.0000	0.0	0.0	0
33	F05	Binh Hoa	0.5	21.3	142	36	852	108	0.0	18.7	0.0	0.0	0.0000	0.0000	0.0	0.0	0
34	F06	Binh Nghi	0.7	19.5	62	10	521	44	0.0	18.7	0.0	0.0	0.0000	0.0000	0.0	0.0	0
35	G03	Binh Hoa	1	22.0	142	36	1,704	216	0.0	18.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
36	G04	Binh Hoa	1	21.0	142	36	1,704	216	0.0	18.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
37	G05	Binh Hoa	0.4	21.1	142	36	682	86	0.0	18.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
38	G06	Binh Nghi	0.8	18.0	62	10	595	50	0.0	18.4	0.4	0.4	0.2400	0.0050	12.0	3.0	15
39	G07	Binh Nghi	1	19.0	62	10	744	62	0.0	18.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
40	H03	Binh Hoa	1	21.0	142	36	1,704	216	0.0	17.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
41	H04	Tay Binh	1	22.0	126	26	1,512	155	0.0	17.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
42	H05	Tay Binh	0.5	21.0	200	48	1,200	143	0.0	17.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
43	H06	Binh Nghi	1	19.0	62	10	744	62	0.0	17.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
44	H07	Binh Nghi	1	21.0	62	10	744	62	0.0	17.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
45	I03	Binh Hoa	1	21.0	142	36	1,704	216	0.0	17.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
46	I04	Tay Binh	1	20.0	200	48	2,400	287	0.0	17.4	0.0	0.0	0.0000	0.0000	0.0	0.0	0
47	I05	Tay Binh	0.4	16.5	200	48	960	115	0.0	17.4	0.9	0.9	0.3000	0.0075	34.4	7.2	42
48	I06	Binh Nghi	0.5	20.0	62	10	372	31	0.0	17.2	0.0	0.0	0.0000	0.0000	0.0	0.0	0
49	I07	Binh Nghi	1	20.0	62	10	744	62	0.0	17.2	0.0	0.0	0.0000	0.0000	0.0	0.0	0
50	I08	Binh Nghi	1	25.0	62	10	744	62	0.0	17.2	0.0	0.0	0.0000	0.0000	0.0	0.0	0
51	J03	Tay Binh	1	19.0	200	48	2,400	287	0.0	17.2	0.0	0.0	0.0000	0.0000	0.0	0.0	0
52	J04	Tay Binh	1	19.0	200	48	2,400	287	0.0	17.2	0.0	0.0	0.0000	0.0000	0.0	0.0	0
53	J05	Tay Binh	0.7	17.0	200	48	1,680	201	0.0	16.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
54	J06	Binh Nghi	0.5	17.0	62	10	372	31	0.0	16.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
55	J07	Binh Nghi	1	20.0	62	10	744	62	0.0	16.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
56	J08	Binh Nghi	1	19.0	62	10	744	62	0.0	16.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
57	J09	Binh Nghi	1	19.5	62	10	744	62	0.0	16.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
58	K01	Tay An	1	13.5	126	26	1,512	155	0.0	16.6	3.1	3.1	1.0000	0.5575	154.8	842.9	998
59	K02	Tay An	1	14.0	126	26	1,512	155	0.0	16.6	2.6	2.6	1.0000	0.4075	154.8	616.1	771
60	K03	Tay Vinh	1	14.0	242	59	2,904	355	0.0	16.6	2.6	2.6	1.0000	0.4075	355.2	1,183.4	1,539
61	K04	Tay Vinh	1	15.0	242	59	2,904	355	0.0	16.6	1.6	1.6	0.6500	0.1100	230.9	319.4	550
62	K05	Tay Vinh	0.6	14.5	242	59	1,742	213	0.0	16.6	2.1	2.1	1.0000	0.2575	213.1	448.7	662
63	K06	Nhon Phuc	1	15.0	254	44	3,048	264	0.0	16.6	1.6	1.6	0.6500	0.1100	171.6	335.3	507
64	K07	Nhon Phuc	1	15.0	254	44	3,048	264	0.0	16.6	1.6	1.6	0.6500	0.1100	171.6	335.3	507
65	L01	Tay An	1	13.0	126	26	1,512	155	0.0	15.9	2.9	2.9	1.0000	0.5075	154.8	767.3	922
66	L02	Tay Vinh	1	13.5	242	59	2,904	355	0.0	15.9	2.4	2.4	1.0000	0.3575	355.2	1,038.2	1,393
67	L03	Tay Vinh	1	14.0	242	59	2,904	355	0.0	15.9	1.9	1.9	0.8600	0.1600	305.5	464.6	770
68	L04	Tay Vinh	0.9	13.5	242	59	2,614	320	0.0	15.9	2.4	2.4	1.0000	0.3575	319.7	934.4	1,254
69	L05	Nhon Phuc	0.5	14.0	254	44	1,524	132	0.0	15.9	1.9	1.9	0.8600	0.1600	113.5	243.8	357
70	L06	Nhon Phuc	1	13.5	254	44	3,048	264	0.0	15.9	2.4	2.4	1.0000	0.3575	264.0	1,089.7	1,354
71	L07	Nhon Phuc	1	16.0	254	44	3,048	264	0.0	15.9	0.0	0.0	0.0000	0.0000	0.0	0.0	0
72	M03	Nhon My	1	12.8	170	39	2,040	232	0.0	15.3	2.5	2.5	1.0000	0.4075	231.6	831.3	1,063
73	M04	Nhon My	1	12.5	170	39	2,040	232	0.0	15.0	2.5	2.5	1.0000	0.3600	231.6	734.4	966
74	M07	Nhon Phuc	1	13.1	254	44	3,048	264	0.0	14.5	1.4	1.4	0.5100	0.1075	134.6	327.7	462
75	M08	Nhon Loc	1	12.6	176	49	2,112	294	0.0	14.5	1.9	1.9	0.8600	0.1600	252.8	337.9	591
76	N03	Nhon My	1	12.0	170	39	2,040	232	0.0	15.0	3.0	3.0	1.0000	0.5575	231.6	1,137.3	1,369
77	N04	Nhon My	1	12.0	170	39	2,040	232	0.0	15.0	3.0	3.0	1.0000	0.5575	231.6	1,137.3	1,369
78	N08	Nhon Loc	1	14.0	176	49	2,112	294	0.0	15.4	1.4	1.4	0.5100	0.1075			

Table N.33 Estimation of Probable Flood Damage of Downstream and Midstream Areas (1/4)

I. Condition in 2001

I-1 Kone River Delta (Downstream Areas)

Without Project: Major Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
Without Project	2	4,746	9,205	11,967	11,046	4,787	3,322	45,072	35,867
	5	22,242	9,845	12,799	11,814	5,119	15,569	77,388	67,543
	10	36,843	12,227	15,895	14,672	6,358	25,790	111,786	99,559
	20	49,200	14,585	18,961	17,502	7,584	34,440	142,272	127,687
	50	79,007	18,769	24,400	22,523	9,760	55,305	209,763	190,994
	100	103,171	22,505	29,257	27,006	11,703	72,220	265,861	243,356

Without Project: Early Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
Without Project	2	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	
	20	-	69	90	83	36	-	277	
	50	41	5,343	6,946	6,412	2,778	29	21,549	
	100	139	7,109	9,242	8,531	3,697	97	28,814	

Without Project: Late Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
Without Project	2	-	-	-	-	-	-	-	
	5	20	5,327	6,925	6,392	2,770	14	21,449	
	10	710	8,073	10,495	9,688	4,198	497	33,660	
	20	5,792	9,255	12,032	11,106	4,813	4,054	47,052	
	50	19,407	9,753	12,679	11,704	5,072	13,585	72,199	
	100	39,801	12,322	16,019	14,786	6,407	27,861	117,196	

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
With Project	2	-	-	-	-	-	-	-	-
	5	-	5,315	6,910	6,378	2,764	-	21,366	16,051
	10	139	7,970	10,361	9,564	4,144	97	32,276	24,306
	20	22,518	13,636	17,727	16,363	7,091	15,763	93,097	79,461
	50	48,511	13,794	17,932	16,553	7,173	33,958	137,921	124,127
	100	70,364	13,940	18,122	16,728	7,249	49,255	175,658	161,718

With Project: Early Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
With Project	2	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	
	50	-	-	-	-	-	-	-	
	100	-	-	-	-	-	-	-	

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
With Project	2	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	
	50	78	7,077	9,200	8,492	3,680	55	28,582	
	100	18,025	13,613	17,697	16,336	7,079	12,618	85,367	

Table N.33 Estimation of Probable Flood Damage of Downstream and Midstream Areas (2/4)

I-2 Midstream Areas

Without Project: Major Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
Without Project	2	14,682	5,373	1,558	4,030	-	12,333	37,976
	5	27,187	6,522	1,891	4,892	-	22,837	63,329
	10	33,679	7,084	2,054	5,313	-	28,290	76,421
	20	36,721	7,895	2,290	5,921	-	30,846	83,672
	50	41,247	8,861	2,570	6,646	-	34,647	93,971
	100	45,202	9,819	2,848	7,364	-	37,970	103,202

Without Project: Late Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
Without Project	2	20	125	36	94	-	17	292
	5	552	986	286	740	-	464	3,027
	10	6,877	3,705	1,074	2,779	-	5,777	20,212
	20	14,682	5,373	1,558	4,030	-	12,333	37,976
	50	27,185	6,522	1,891	4,892	-	22,835	63,325
	100	35,137	7,380	2,140	5,535	-	29,515	79,707

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
With Project	2	556	1,003	291	752	-	467	3,069
	5	5,356	3,499	1,015	2,624	-	4,499	16,993
	10	13,542	5,259	1,525	3,944	-	11,375	35,646
	20	18,773	6,002	1,741	4,502	-	15,769	46,786
	50	25,786	6,480	1,879	4,860	-	21,660	60,665
	100	30,510	6,686	1,939	5,015	-	25,628	69,778

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
With Project	2	20	125	36	94	-	17	292
	5	41	255	74	191	-	34	596
	10	556	1,003	291	752	-	467	3,069
	20	2,958	2,763	801	2,072	-	2,485	11,079
	50	10,693	4,840	1,404	3,630	-	8,982	29,549
	100	18,773	6,002	1,741	4,502	-	15,769	46,786

Table N.33 Estimation of Probable Flood Damage of Downstream and Midstream Areas (3/4)

II. Condition in 2020

II-1 Kone River Delta (Downstream Areas)

Without Project: Major Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
Without Project	2	14,076	14,575	18,948	17,490	7,579	9,853	82,521	67,946
	5	65,965	15,588	20,264	18,706	8,106	46,176	174,804	159,216
	10	109,267	19,360	25,168	23,232	10,067	76,487	263,581	244,221
	20	145,922	23,093	30,021	27,712	12,008	102,145	340,901	317,808
	50	234,387	29,718	38,633	35,662	15,453	164,071	517,924	488,206
	100	306,120	35,633	46,323	42,760	18,529	214,284	663,649	628,016

Without Project: Early Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
Without Project	2	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	
	20	-	109	142	131	57	-	438	
	50	122	8,459	10,997	10,151	4,399	85	34,213	
	100	412	11,257	14,634	13,508	5,854	288	45,954	

Without Project: Late Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
Without Project	2	-	-	-	-	-	-	-	
	5	61	8,435	10,966	10,122	4,386	43	34,012	
	10	2,105	12,783	16,618	15,340	6,647	1,474	54,966	
	20	17,178	14,654	19,050	17,585	7,620	12,025	88,112	
	50	57,554	15,442	20,075	18,530	8,030	40,288	159,919	
	100	118,040	19,509	25,362	23,411	10,145	82,628	279,094	

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							
		Housing assets b	Crop damage (for calculation only) c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%	Sub-total h	Total w/o crop damage i=h-c
With Project	2	-	-	-	-	-	-	-	-
	5	-	8,416	10,941	10,099	4,376	-	33,832	25,416
	10	412	12,619	16,405	15,143	6,562	288	51,429	38,810
	20	66,832	21,590	28,067	25,908	11,227	46,782	200,406	178,816
	50	143,977	21,840	28,392	26,208	11,357	100,784	332,558	310,718
	100	208,831	22,071	28,692	26,485	11,477	146,182	443,738	421,667

With Project: Early Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
With Project	2	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	
	50	-	-	-	-	-	-	-	
	100	-	-	-	-	-	-	-	

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)							Total h
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 130%	Irrigation facilities e=c x 120%	Aquaculture f=c x 40%	Infrastructure g=b x 70%		
With Project	2	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	
	50	230	11,205	14,567	13,446	5,827	161	45,435	
	100	53,499	21,554	28,020	25,865	11,208	37,449	177,595	

Table N.33 Estimation of Probable Flood Damage of Downstream and Midstream Areas (4/4)

I-2 Midstream Areas

Without Project: Major Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
Without Project	2	45,874	8,506	2,467	6,380	-	38,534	101,760
	5	84,935	10,373	3,008	7,780	-	71,345	177,441
	10	105,114	11,216	3,253	8,412	-	88,296	216,290
	20	114,510	12,500	3,625	9,375	-	96,188	236,198
	50	128,358	14,030	4,069	10,523	-	107,821	264,800
	100	140,333	15,547	4,509	11,660	-	117,880	289,929

Without Project: Late Flood

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
Without Project	2	64	198	57	149	-	54	522
	5	1,725	1,561	453	1,171	-	1,449	6,358
	10	21,487	5,866	1,701	4,400	-	18,049	51,503
	20	45,874	8,506	2,467	6,380	-	38,534	101,760
	50	84,929	10,326	2,995	7,745	-	71,340	177,334
	100	109,661	11,684	3,388	8,763	-	92,115	225,612

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
With Project	2	1,737	1,588	461	1,191	-	1,459	6,436
	5	16,741	5,540	1,607	4,155	-	14,062	42,105
	10	42,311	8,326	2,415	6,245	-	35,541	94,837
	20	58,657	9,503	2,756	7,127	-	49,272	127,315
	50	80,557	10,260	2,975	7,695	-	67,668	169,155
	100	95,309	10,586	3,070	7,940	-	80,060	196,964

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period (Year) a	Probable Flood Damage (VND Million)						
		Housing assets b	Crop damage c	Sedimentation on farmland d=c x 29%	Irrigation facilities e=c x 75%	Aquaculture f=c x 0%	Infrastructure g=b x 84%	Total h
With Project	2	64	198	57	149	-	54	522
	5	127	404	117	303	-	107	1,058
	10	1,737	1,588	461	1,191	-	1,459	6,436
	20	9,247	4,374	1,268	3,281	-	7,767	25,937
	50	33,412	7,663	2,222	5,747	-	28,066	77,111
	100	58,657	9,503	2,756	7,127	-	49,272	127,315

Table N.34 Calculation of Annual Mean Flood Damage of Downstream and Midstream Areas (1/4)

I. Condition in 2001

I-1 Kone River Delta (Downstream Areas)

Without Project: Major Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	35,867	17,934	8,967	8,967	0.60
	5	0.20	0.30	67,543	51,705	15,512	24,478	1.62
	10	0.10	0.10	99,559	83,551	8,355	32,834	2.18
	20	0.05	0.05	127,687	113,623	5,681	38,515	2.56
	50	0.02	0.03	190,994	159,340	4,780	43,295	2.87
100	0.010	0.01	243,356	217,175	2,172	45,467	3.02	

Without Project: Early Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	277	139	7	7	0.00
	50	0.02	0.03	21,549	10,913	327	334	0.02
100	0.010	0.01	28,814	25,182	252	586	0.04	

Without Project: Late Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	21,449	10,724	3,217	3,217	0.21
	10	0.10	0.10	33,660	27,555	2,755	5,973	0.40
	20	0.05	0.05	47,052	40,356	2,018	7,991	0.53
	50	0.02	0.03	72,199	59,625	1,789	9,779	0.65
100	0.010	0.01	117,196	94,698	947	10,726	0.71	

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	16,051	8,026	2,408	2,408	0.16
	10	0.10	0.10	24,306	20,179	2,018	4,426	0.29
	20	0.05	0.05	79,461	51,884	2,594	7,020	0.47
	50	0.02	0.03	124,127	101,794	3,054	10,074	0.67
100	0.010	0.01	161,718	142,922	1,429	11,503	0.76	

With Project: Early Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	-	-	-	-	-
100	0.010	0.01	-	-	-	-	-	

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	28,582	14,291	429	429	0.03
100	0.010	0.01	85,367	56,974	570	998	0.07	

Table N.34 Calculation of Annual Mean Flood Damage of Downstream and Midstream Areas (2/4)

I-2 Midstream Areas

Without Project: Major Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	37,976	18,988	9,494	9,494	0.63
	5	0.20	0.30	63,329	50,652	15,196	24,690	1.64
	10	0.10	0.10	76,421	69,875	6,987	31,677	2.10
	20	0.05	0.05	83,672	80,047	4,002	35,679	2.37
	50	0.02	0.03	93,971	88,822	2,665	38,344	2.54
100	0.010	0.01	103,202	98,587	986	39,330	2.61	

Without Project: Late Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	292	146	73	73	0.00
	5	0.20	0.30	3,027	1,659	498	571	0.04
	10	0.10	0.10	20,212	11,620	1,162	1,733	0.11
	20	0.05	0.05	37,976	29,094	1,455	3,187	0.21
	50	0.02	0.03	63,325	50,651	1,520	4,707	0.31
100	0.010	0.01	79,707	71,516	715	5,422	0.36	

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	3,069	1,535	767	767	0.05
	5	0.20	0.30	16,993	10,031	3,009	3,777	0.25
	10	0.10	0.10	35,646	26,319	2,632	6,409	0.43
	20	0.05	0.05	46,786	41,216	2,061	8,469	0.56
	50	0.02	0.03	60,665	53,726	1,612	10,081	0.67
100	0.010	0.01	69,778	65,222	652	10,733	0.71	

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	292	146	73	73	0.00
	5	0.20	0.30	596	444	133	206	0.01
	10	0.10	0.10	3,069	1,832	183	389	0.03
	20	0.05	0.05	11,079	7,074	354	743	0.05
	50	0.02	0.03	29,549	20,314	609	1,352	0.09
100	0.010	0.01	46,786	38,168	382	1,734	0.12	

Table N.34 Calculation of Annual Mean Flood Damage of Downstream and Midstream Areas (3/4)

II. Condition in 2020

II-1 Kone River Delta (Downstream Areas)

Without Project: Major Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	67,946	33,973	16,986	16,986	1.13
	5	0.20	0.30	159,216	113,581	34,074	51,061	3.39
	10	0.10	0.10	244,221	201,719	20,172	71,233	4.73
	20	0.05	0.05	317,808	281,015	14,051	85,283	5.66
	50	0.02	0.03	488,206	403,007	12,090	97,374	6.46
	100	0.010	0.01	628,016	558,111	5,581	102,955	6.83

Without Project: Early Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	438	219	11	11	0.00
	50	0.02	0.03	34,213	17,325	520	531	0.04
	100	0.010	0.01	45,954	40,083	401	932	0.06

Without Project: Late Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	34,012	17,006	5,102	5,102	0.34
	10	0.10	0.10	54,966	44,489	4,449	9,551	0.63
	20	0.05	0.05	88,112	71,539	3,577	13,128	0.87
	50	0.02	0.03	159,919	124,015	3,720	16,848	1.12
	100	0.010	0.01	279,094	219,506	2,195	19,043	1.26

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	25,416	12,708	3,812	3,812	0.25
	10	0.10	0.10	38,810	32,113	3,211	7,024	0.47
	20	0.05	0.05	178,816	108,813	5,441	12,464	0.83
	50	0.02	0.03	310,718	244,767	7,343	19,807	1.31
	100	0.010	0.01	421,667	366,192	3,662	23,469	1.56

With Project: Early Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	-	-	-	-	-
	100	0.010	0.01	-	-	-	-	-

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	-	-	-	-	-
	5	0.20	0.30	-	-	-	-	-
	10	0.10	0.10	-	-	-	-	-
	20	0.05	0.05	-	-	-	-	-
	50	0.02	0.03	45,435	22,718	682	682	0.05
	100	0.010	0.01	177,595	111,515	1,115	1,797	0.12

Table N.34 Calculation of Annual Mean Flood Damage of Downstream and Midstream Areas (4/4)

II-2 Midstream Areas

Without Project: Major Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	101,760	50,880	25,440	25,440	1.69
	5	0.20	0.30	177,441	139,601	41,880	67,320	4.47
	10	0.10	0.10	216,290	196,866	19,687	87,007	5.77
	20	0.05	0.05	236,198	226,244	11,312	98,319	6.53
	50	0.02	0.03	264,800	250,499	7,515	105,834	7.02
100	0.010	0.01	289,929	277,364	2,774	108,608	7.21	

Without Project: Late Flood

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
Without Project	-	1.00						
	2	0.50	0.50	522	261	130	130	0.01
	5	0.20	0.30	6,358	3,440	1,032	1,162	0.08
	10	0.10	0.10	51,503	28,931	2,893	4,055	0.27
	20	0.05	0.05	101,760	76,632	3,832	7,887	0.52
	50	0.02	0.03	177,334	139,547	4,186	12,073	0.80
100	0.010	0.01	225,612	201,473	2,015	14,088	0.93	

With Project: Major Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	6,436	3,218	1,609	1,609	0.11
	5	0.20	0.30	42,105	24,270	7,281	8,890	0.59
	10	0.10	0.10	94,837	68,471	6,847	15,737	1.04
	20	0.05	0.05	127,315	111,076	5,554	21,291	1.41
	50	0.02	0.03	169,155	148,235	4,447	25,738	1.71
100	0.010	0.01	196,964	183,060	1,831	27,569	1.83	

With Project: Late Flood - Flood Control Capacity of Dam: 292.77MCM - New Sea Dike Spillway

Condition	Return Period	Exceedance	Difference of Exceedance	Damage (VND mil)		Annual Damage (VND mil)		Equivalent US\$ million
				Amount	Mean	Segment	Cumulative	
With Project	-	1.00						
	2	0.50	0.50	522	261	130	130	0.01
	5	0.20	0.30	1,058	790	237	367	0.02
	10	0.10	0.10	6,436	3,747	375	742	0.05
	20	0.05	0.05	25,937	16,187	809	1,551	0.10
	50	0.02	0.03	77,111	51,524	1,546	3,097	0.21
100	0.010	0.01	127,315	102,213	1,022	4,119	0.27	

Table N.35 Financial and Economic Project Cost

Unit: Million VND

Description	Financial Cost				Economic Cost without Price Escalation			
	Dinh Binh Reservoir (El.100.3m) incl. hydropower	Flood Control facilities with New Sea Dike Spillway	Irrigation & drainage facilities incl. La Tinh	Total	Dinh Binh Reservoir (El.100.3m) incl. hydropower	Flood Control facilities	Irrigation & drainage facilities incl. La Tinh	Total
1. Direct Construction Cost	762,808	699,931	1,074,676	2,537,415	686,527	629,938	967,208	2,283,673
(1) Civil works	631,858	699,931	1,074,676	2,406,465	568,672	629,938	967,208	
(2) Plant works	130,950	-	-	130,950	117,855	-	-	
2. Indirect Construction Cost								
(1) Resettlement Cost	134,656	27,580	79,294	241,530	121,190	24,822	71,365	217,377
(2) Engineering Cost	76,281	69,993	107,468	253,742	68,653	62,994	96,721	228,368
(3) Administration Cost	26,924	21,825	34,619	83,368	24,232	19,643	31,157	75,032
(4) Price Escalation (4.9%/year)	272,236	422,527	373,484	1,068,247	-	-	-	-
(5) Physical Contingency (Plant:5%,other:10%)	120,743	124,186	166,954	411,883	84,167	73,740	116,645	274,552
Sub-total (1)~(5)	630,840	666,111	761,819	2,058,770	298,242	181,199	315,888	795,329
Total (1.+ 2.)	1,393,648	1,366,042	1,836,495	4,596,185	984,769	811,137	1,283,096	3,079,002
3. VAT (5%)	55,767	60,043	78,838	194,648	-	-	-	-
Total (1.+ 2.+ 3.)	1,449,415	1,426,085	1,915,333	4,790,833	984,769	811,137	1,283,096	3,079,002
Equivalent Million US\$	96.19	94.64	127.11	317.95	65.35	53.83	85.15	204.34

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Table N.36 Annual Economic Project Cost

Unit: Million US\$

Cost Item	Total (Million VND)	Equivalent (Million US\$)	Year																		
			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1. Dinh Binh Reservoir (El: 100.3m) including Hydropower																					
(1) Direct Construction Cost	686,527	45.56	-	-	-	1.85	1.85	10.57	6.45	7.11	8.94	8.80	-	-	-	-	-	-	-	-	-
a. Civil works	568,672	37.74	-	-	-	1.85	1.85	10.57	6.45	6.45	8.30	2.26	-	-	-	-	-	-	-	-	-
b. Plant works	117,855	7.82	-	-	-	-	-	-	-	0.66	0.63	6.53	-	-	-	-	-	-	-	-	-
(2) Indirect Construction Cost																					
a. Resettlement cost	121,190	8.04	-	2.33	2.33	2.33	1.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Engineering cost	68,653	4.56	-	-	-	0.73	0.64	0.64	0.64	0.64	0.64	0.64	-	-	-	-	-	-	-	-	-
c. Administration cost	24,232	1.61	-	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-	-	-	-	-	-	-	-	-
d. Physical contingency	84,167	5.59	-	0.25	0.25	0.51	0.37	1.14	0.73	0.76	0.94	0.63	-	-	-	-	-	-	-	-	-
Subtotal of (2)	298,242	19.79	-	2.78	2.76	3.75	2.23	1.95	1.54	1.57	1.76	1.45	-	-	-	-	-	-	-	-	-
Total of (1) + (2)	984,769	65.36	-	2.78	2.76	5.60	4.08	12.52	8.00	8.69	10.69	10.24	-	-	-	-	-	-	-	-	-
2. Flood Control Facilities with New Sea Dike Spillways																					
(1) Direct Construction Cost	629,938	41.81	-	-	-	-	-	-	-	-	-	-	12.96	12.88	6.98	4.56	4.39	-	-	-	-
(2) Indirect Construction Cost																					
a. Resettlement cost	24,822	1.65	-	-	-	-	-	-	0.48	0.48	0.48	0.21	-	-	-	-	-	-	-	-	-
b. Engineering cost	62,994	4.18	-	-	-	-	-	-	-	-	0.67	0.59	0.59	0.59	0.59	0.59	0.59	-	-	-	-
c. Administration cost	19,643	1.30	-	-	-	-	-	-	0.16	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-	-	-	-
d. Physical contingency	73,740	4.89	-	-	-	-	-	-	0.06	0.06	0.13	0.09	1.37	1.36	0.77	0.53	0.51	-	-	-	-
Subtotal of (2)	181,199	12.03	-	-	-	-	-	-	0.70	0.68	1.42	1.04	2.10	2.09	1.50	1.26	1.24	-	-	-	-
Total of (1) + (2)	811,137	53.83	-	-	-	-	-	-	0.70	0.68	1.42	1.04	15.06	14.97	8.48	5.81	5.63	-	-	-	-
3. Irrigation and Drainage Facilities incl. La Tinh River Basin																					
(1) Direct Construction Cost	967,208	64.19	-	-	-	-	-	13.80	13.35	12.65	12.65	11.68	-	-	-	-	-	-	-	-	-
(2) Indirect Construction Cost																					
a. Resettlement cost	71,365	4.74	-	1.37	1.37	1.37	0.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b. Engineering cost	96,721	6.42	-	-	-	1.03	0.90	0.90	0.90	0.90	0.90	0.90	-	-	-	-	-	-	-	-	-
c. Administration cost	31,157	2.07	-	0.25	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	-	-	-	-	-	-	-	-	-
d. Physical contingency	116,645	7.74	-	0.16	0.16	0.26	0.17	1.49	1.45	1.38	1.38	1.28	-	-	-	-	-	-	-	-	-
Subtotal of (2)	315,888	20.96	-	1.78	1.76	2.89	1.92	2.62	2.57	2.50	2.50	2.41	-	-	-	-	-	-	-	-	-
Total of (1) + (2)	1,283,096	85.15	-	1.78	1.76	2.89	1.92	16.42	15.93	15.15	15.15	14.09	-	-	-	-	-	-	-	-	-
5. Whole Projects																					
(1) Direct Construction Cost	2,283,673	151.56	-	-	-	1.85	1.85	24.37	19.81	19.76	21.58	20.48	12.96	12.88	6.98	4.56	4.39	-	-	-	-
(2) Indirect Construction Cost																					
a. Resettlement cost	217,377	14.43	-	1.37	1.37	1.37	0.62	-	0.48	1.13	1.11	6.75	-	-	-	-	-	-	-	-	-
b. Engineering cost	228,368	15.16	-	-	-	1.03	0.90	0.90	0.90	0.90	1.57	1.48	0.59	0.59	0.59	0.59	0.59	-	-	-	-
c. Administration cost	75,032	4.98	-	2.58	2.56	2.56	1.27	0.23	0.38	0.37	0.37	0.37	0.14	0.14	0.14	0.14	0.14	-	-	-	-
d. Physical contingency	274,552	18.22	-	0.16	0.16	0.99	0.81	2.13	2.15	2.08	2.14	2.01	1.37	1.36	0.77	0.53	0.51	-	-	-	-
Subtotal of (2)	795,329	52.78	-	1.98	1.94	3.07	2.09	2.80	3.45	3.36	4.10	3.62	2.10	2.09	1.50	1.26	1.24	-	-	-	-
Total of (1) + (2)	3,079,002	204.34	-	2.04	2.01	3.40	2.29	17.56	17.35	16.59	17.51	15.76	15.06	14.97	8.48	5.81	5.63	-	-	-	-

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Table N.37 Cost-Benefit Analysis

Unit: Million US\$

Year in order	Year	Benefit				Cost										Total Cost	Net Cash Flow			
		Irrigation and drainage	Hydro-power	Flood control	Total Benefit	Investment					O/M							Replacement		
						Direct constr.	Resettle-ment	Engring service	Adminis-tration	Physical conti.	Sub-total	Dam	Flood control	Irrigation drainage	Hydro-power					
0	2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	2003	-	-	-	-	-	1.37	-	2.58	0.16	4.12	-	-	-	-	-	-	-	4.12	-4.12
3	2004	-	-	-	-	-	1.37	-	2.56	0.16	4.09	-	-	-	-	-	-	-	4.09	-4.09
4	2005	-	-	-	-	1.85	1.37	1.03	2.56	0.99	7.80	-	-	-	-	-	-	-	7.80	-7.80
5	2006	-	-	-	-	1.85	0.62	0.90	1.27	0.81	5.45	-	-	-	-	-	-	-	5.45	-5.45
6	2007	-	-	-	-	24.37	-	0.90	0.23	2.13	27.62	-	-	-	-	-	-	-	27.62	-27.62
7	2008	0.50	-	-	0.50	19.81	0.48	0.90	0.38	2.15	23.71	-	-	0.01	-	-	-	-	23.73	-23.22
8	2009	2.09	-	-	2.09	19.76	1.13	0.90	0.37	2.08	24.24	-	-	0.05	-	-	-	-	24.29	-22.20
9	2010	4.58	-	-	4.58	21.58	1.11	1.57	0.37	2.14	26.78	-	-	0.12	-	-	-	-	26.89	-22.31
10	2011	6.55	-	-	6.55	20.48	6.75	1.48	0.37	2.01	31.09	-	-	0.17	-	-	-	-	31.26	-24.71
11	2012	14.36	1.89	6.02	22.28	12.96	-	0.59	0.14	1.37	15.06	0.19	0.06	0.37	0.12	-	-	-	15.80	6.48
12	2013	16.38	1.89	6.27	24.54	12.88	-	0.59	0.14	1.36	14.97	0.19	0.06	0.42	0.12	-	-	-	15.76	8.78
13	2014	17.12	1.89	8.70	27.71	6.98	-	0.59	0.14	0.77	8.48	0.19	0.09	0.44	0.12	-	-	-	9.32	18.39
14	2015	17.12	1.89	9.03	28.05	4.56	-	0.59	0.14	0.53	5.81	0.19	0.09	0.44	0.12	-	-	-	6.66	21.39
15	2016	17.12	1.89	10.54	29.55	4.39	-	0.59	0.14	0.51	5.63	0.19	0.11	0.44	0.12	-	-	-	6.49	23.07
16	2017	17.12	1.89	12.13	31.14	-	-	-	-	-	-	0.19	0.24	0.44	0.12	-	-	-	0.99	30.15
17	2018	17.12	1.89	12.55	31.56	-	-	-	-	-	-	0.19	0.25	0.44	0.12	-	-	-	1.00	30.56
18	2019	17.12	1.89	12.97	31.98	-	-	-	-	-	-	0.19	0.26	0.44	0.12	-	-	-	1.01	30.97
19	2020	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
20	2021	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
21	2022	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
22	2023	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
23	2024	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
24	2025	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
25	2026	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
26	2027	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	0.15	-	1.17	31.23
27	2028	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
28	2029	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
29	2030	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
30	2031	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
31	2032	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
32	2033	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
33	2034	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
34	2035	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
35	2036	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
36	2037	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	17.02	-	18.04	14.36
37	2038	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	7.15	-	8.17	24.23
38	2039	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
39	2040	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
40	2041	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
41	2042	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	7.78	-	8.80	23.60
42	2043	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
43	2044	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
44	2045	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
45	2046	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
46	2047	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	0.15	-	1.17	31.23
47	2048	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
48	2049	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
49	2050	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
50	2051	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
51	2052	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
52	2053	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
53	2054	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
54	2055	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
55	2056	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
56	2057	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	0.15	-	1.17	31.23
57	2058	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
58	2059	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
59	2060	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
60	2061	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
61	2062	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
62	2063	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
63	2064	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
64	2065	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
65	2066	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	-	-	1.02	31.38
66	2067	17.12	1.89	13.39	32.40	-	-	-	-	-	-	0.19	0.27	0.44	0.12	-	0.15	-	1.17	31.23

EIRR= 12.0%

B/C = 1.23 (at discount rate: 10%)

NPV= 22.6 (at discount rate: 10%)

**Table N.38 Financial Cash Flow Statement for Implementation of the Projects (at 2001 Constant Price)
(Kone River Water Resources Development Plan)**

Dinh Binh Reservoir (Effective Storage: 279.51 MCM), Hydropower: 37.8GWh/year, River Improvement, and Irrigation Development: 37,400ha Unit: US\$ million

Year in order	Year	Capital Cost											Cost covered by foreign loan	Foreign Loan Accumulated	A part of capital cost to be allocated by the Government	Cash Outflow						Cash Inflow				Balance (b) - (a)					
		Reservoir & hydropower			Flood control			Irrigation & drainage			Total					O & M cost				Total (a)	Irrigation water	Hydro-power	Government subsidy	Total (b)							
		Eligible	Non-elig	Total	Eligible	Non-elig	Total	Eligible	Non-elig	Total	Eligible	Non-elig				Total	Reservoir	Flood control	Hydropower						Irrigation		Replacement cost	Interest	Capital		
TOTAL		78	18	96	85	10	95	112	15	127	275	43	318	270.25		85%	48					69	270.25								
1	2001			-																											
2	2002			-																											
3	2003		3.41	3.41					2.20	2.20																					
4	2004		3.55	3.55					2.27	2.27																					
5	2005	3.58	3.89	7.47			-	1.43	2.45	3.88	5.01	6.34	11.35	5.01	5.01																
6	2006	3.58	2.07	5.65			-	1.30	1.38	2.68	4.88	3.45	8.33	4.88	9.89							0.09	0.09						0.09	0.09	
7	2007	16.66	1.06	17.72				21.85	1.38	23.23	38.51	2.44	40.95	37.10	46.99							0.18	0.18						0.18	0.18	
8	2008	10.87	0.81	11.68		1.10	1.10	21.91	1.40	23.31	32.78	3.31	36.09	32.70	79.69							0.85	0.86	0.03					0.83	0.86	
9	2009	12.24	0.89	13.13		1.12	1.12	21.55	1.41	22.96	33.79	3.42	37.21	33.71	113.40							1.43	1.49	0.13					1.36	1.49	
10	2010	15.72	1.06	16.78	1.10	1.23	2.33	22.30	1.46	23.76	39.12	3.75	42.87	38.84	152.24							2.04	2.17	0.30					1.87	2.17	
11	2011	15.70	1.09	16.79	1.00	0.76	1.76	21.39	1.44	22.83	38.09	3.29	41.38	37.49	189.73							2.74	2.92	0.43					2.50	2.92	
12	2012				23.81	1.39	25.20				-	23.81	1.39	25.20	22.83							3.42	4.20	0.94	1.97				1.29	4.20	
13	2013				24.57	1.44	26.01				-	24.57	1.44	26.01	23.57							3.83	4.71	1.08	1.97				1.67	4.71	
14	2014				14.29	0.99	15.28				-	14.29	0.99	15.28	13.93							4.25	5.20	1.12	1.97				2.11	5.20	
15	2015				10.09	0.82	10.91				-	10.09	0.82	10.91	10.09							4.50	13.51	19.01	1.12	1.97			15.92	19.01	
16	2016				10.10	0.83	10.93				-	10.10	0.83	10.93	10.10							4.44	13.51	19.00	1.12	1.97			15.91	19.00	
17	2017										-											4.38	13.51	18.98	1.12	1.97			15.89	18.98	
18	2018										-											4.13	13.51	18.74	1.12	1.97			15.65	18.74	
19	2019										-											3.89	13.51	18.49	1.12	1.97			15.40	18.49	
20	2020										-											3.65	13.51	18.25	1.12	1.97			15.16	18.25	
21	2021										-											3.41	13.51	18.01	1.12	1.97			14.92	18.01	
22	2022										-											3.16	13.51	17.76	1.12	1.97			14.67	17.76	
23	2023										-											2.92	13.51	17.52	1.12	1.97			14.43	17.52	
24	2024										-											2.68	13.51	17.28	1.12	1.97			14.19	17.28	
25	2025										-											2.43	13.51	17.03	1.12	1.97			13.94	17.03	
26	2026										-										0.16	2.19	13.51	16.95	1.12	1.97			13.86	16.95	
27	2027										-											1.95	13.51	16.55	1.12	1.97			13.46	16.55	
28	2028										-											1.70	13.51	16.31	1.12	1.97			13.22	16.31	
29	2029										-											1.46	13.51	16.06	1.12	1.97			12.97	16.06	
30	2030										-											1.22	13.51	15.82	1.12	1.97			12.73	15.82	
31	2031										-											0.97	13.51	15.58	1.12	1.97			12.49	15.58	
32	2032										-											0.73	13.51	15.33	1.12	1.97			12.24	15.33	
33	2033										-											0.49	13.51	15.09	1.12	1.97			12.00	15.09	
34	2034										-											0.24	13.51	14.85	1.12	1.97			11.76	14.85	
35	2035										-											-	1.09	1.12	1.97				-	3.09	2.00
36	2036										-											18.41	-	19.50	1.12	1.97			16.41	19.50	
37	2037										-											7.73	-	8.82	1.12	1.97			5.73	8.82	
38	2038										-											-	1.09	1.12	1.97				-	3.09	2.00
39	2039										-											-	1.09	1.12	1.97				-	3.09	2.00
40	2040										-											-	1.09	1.12	1.97				-	3.09	2.00
41	2041										-											-	1.09	1.12	1.97				-	3.09	2.00
42	2042										-											8.41	-	9.50	1.12	1.97			-	3.09	-6.41
43	2043										-											-	1.09	1.12	1.97				-	3.09	2.00
44	2044										-											-	1.09	1.12	1.97				-	3.09	2.00
45	2045										-											-	1.09	1.12	1.97				-	3.09	2.00
46	2046										-											0.16	-	1.25	1.12	1.97			-	3.09	1.84
47	2047										-											-	1.09	1.12	1.97				-	3.09	2.00
48	2048										-											-	1.09	1.12	1.97				-	3.09	2.00
49	2049										-											-	1.09	1.12	1.97				-	3.09	2.00
50	2050										-											-	1.09	1.12	1.97				-	3.09	2.00

Note: 1) 85 percent of the capital costs are assumed to be financed by bilateral or international financial organization as far as the costs are eligible items.

2) The non-eligible items are costs for land acquisition, house compensation, administration, and any type of taxes and duties.

3) The assumed condition of finance is with an interest rate of 18 percent per annum for repayment period of 30 years including a grace period of 10 years.

4) Weighted average irrigation fee in Binh Dinh Province as of April 2001 is applied.

5) Constant prices as of 2001 are used for investment, O & M costs, replacement cost, electricity, and irrigation fee.

Table N.39 Financial Crop Budget under Without-Project (1/2)

	Unit	Irrigated Winter-Spring Paddy			Irrigated Summer-Autumn Paddy			Irrigated 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,500	5,000	7,500,000	1,500	4,400	6,600,000	1,500	3,400	5,100,000
2. Production Cost				2,576,100			2,317,900			2,096,800
2.1 Labour	man day	3,000	100	300,000	3,000	100	300,000	3,000	100	300,000
2.2 Input				1,424,300			1,246,500			1,138,300
- Seed	kg	2,000	140	280,000	2,000	130	260,000	2,000	120	240,000
- Manure	kg	70	690	48,300	70	550	38,500	70	490	34,300
- Nitrogen	kg	2,200	170	374,000	2,200	150	330,000	2,200	130	286,000
- Phosphate	kg	3,000	120	360,000	3,000	100	300,000	3,000	100	300,000
- Potassium	kg	2,200	110	242,000	2,200	90	198,000	2,200	90	198,000
- Chemicals	lit	40,000	3	120,000	40,000	3	120,000	40,000	2	80,000
2.3 Machinery	hrs	16,700	18	300,600	16,700	17	283,900	16,700	16	267,200
2.4 Irrigation	6%			450,000			396,000			306,000
2.5 Others	5%			101,200			91,500			85,300
3. Net Income				4,923,900			4,282,100			3,003,200

	Unit	Irrigated Maize			Irrigated Groundnuts			Irrigated Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,330	3,500	4,655,000	4,260	1,500	6,390,000	4,150	1,200	4,980,000
2. Production Cost				1,851,620			1,826,800			1,816,800
2.1 Labour	man day	3,000	70	210,000	3,000	70	210,000	3,000	80	240,000
2.2 Input				1,120,420			997,700			1,038,700
- Seed	kg	2,500	160	400,000	2,300	170	391,000	2,400	180	432,000
- Manure	kg	70	6	420	70	10	700	70	10	700
- Nitrogen	kg	2,200	140	308,000	2,200	70	154,000	2,200	70	154,000
- Phosphate	kg	3,000	80	240,000	3,000	80	240,000	3,000	80	240,000
- Potassium	kg	2,200	60	132,000	2,200	60	132,000	2,200	60	132,000
- Chemicals	lit	40,000	1	40,000	40,000	2	80,000	40,000	2	80,000
2.3 Machinery	hrs	16,700	10	167,000	16,700	10	167,000	16,700	10	167,000
2.4 Irrigation	6%			279,300			383,400			298,800
2.5 Others	5%			74,900			68,700			72,300
3. Net Income				2,803,380			4,563,200			3,163,200

	Unit	Irrigated Tobacco			Irrigated Sugarcane (average annual cost)			Price VDN	Q'ty	Amount VDN/ha
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha			
1. Gross Income	kg	7,000	1,510	10,570,000	200	49,700	9,940,000	-	-	-
2. Production Cost				3,287,900			5,012,000			
2.1 Labour	man day	3,000	250	750,000	3,000	220	660,000	-	-	-
2.2 Input				1,476,700			3,244,700			-
- Seed	kg	3,500	180	630,000	500	5,000	2,500,000	-	-	-
- Manure	kg	70	10	700	70	10	700	-	-	-
- Nitrogen	kg	2,200	180	396,000	2,200	120	264,000	-	-	-
- Phosphate	kg	3,000	10	30,000	3,000	60	180,000	-	-	-
- Potassium	kg	2,200	100	220,000	2,200	100	220,000	-	-	-
- Chemicals	lit	40,000	5	200,000	40,000	2	80,000	-	-	-
2.3 Machinery	hrs	16,700	18	300,600	16,700	18	300,600	-	-	-
2.4 Irrigation	6%			634,200			596,400			-
2.5 Others	5%			126,400			210,300			-
3. Net Income				7,282,100			4,928,000			-

Table N.39 Financial Crop Budget under Without-Project (2/2)

	Unit	Rainfed Winter-Spring Paddy			Rainfed Summer-Autumn Paddy			Rainfed 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,500	3,500	5,250,000	1,500	3,200	4,800,000	1,500	2,800	4,200,000
2. Production Cost				1,775,800			1,661,100			1,525,400
2.1 Labour	man day	3,000	85	255,000	3,000	80	240,000	3,000	75	225,000
2.2 Input				1,169,000			1,091,500			994,000
- Seed	kg	2,000	130	260,000	2,000	130	260,000	2,000	120	240,000
- Manure	kg	70	500	35,000	70	450	31,500	70	400	28,000
- Nitrogen	kg	2,200	130	286,000	2,200	120	264,000	2,200	110	242,000
- Phosphate	kg	3,000	90	270,000	3,000	80	240,000	3,000	70	210,000
- Potassium	kg	2,200	90	198,000	2,200	80	176,000	2,200	70	154,000
- Chemicals	lit	40,000	3	120,000	40,000	3	120,000	40,000	3	120,000
2.3 Machinery	hrs	16,700	16	267,200	16,700	15	250,500	16,700	14	233,800
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			84,600			79,100			72,600
3. Net Income				3,474,200			3,138,900			2,674,600

	Unit	Rainfed Maize			Rainfed Groundnuts			Rainfed Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,330	1,400	1,862,000	4,260	900	3,834,000	4,150	700	2,905,000
2. Production Cost				1,068,250			1,095,480			1,176,420
2.1 Labour	man day	3,000	40	120,000	3,000	50	150,000	3,000	65	195,000
2.2 Input				730,350			726,280			758,420
- Seed	kg	2,500	140	350,000	2,300	120	276,000	2,400	150	360,000
- Manure	kg	70	5	350	70	4	280	70	6	420
- Nitrogen	kg	2,200	70	154,000	2,200	50	110,000	2,200	50	110,000
- Phosphate	kg	3,000	40	120,000	3,000	50	150,000	3,000	40	120,000
- Potassium	kg	2,200	30	66,000	2,200	50	110,000	2,200	40	88,000
- Chemicals	lit	40,000	1	40,000	40,000	2	80,000	40,000	2	80,000
2.3 Machinery	hrs	16,700	10	167,000	16,700	10	167,000	16,700	10	167,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			50,900			52,200			56,000
3. Net Income				793,750			2,738,520			1,728,580

	Unit	Rainfed Tobacco			Irrigated Sugarcane (average annual cost)			Rainfed Cassava		
		Price (VDN)	Q'ty	Amount (VDN/ha)	Price (VDN)	Q'ty	Amount (VDN/ha)	Price (VDN)	Q'ty	Amount (VDN/ha)
1. Gross Income	kg	7,000	980	6,860,000	200	34,070	6,814,000	230	7,000	1,610,000
2. Production Cost				1,978,260			3,871,700			1,189,900
2.1 Labour	man day	3,000	180	540,000	3,000	170	510,000	15,000	35	525,000
2.2 Input				1,093,560			2,876,700			533,200
- Seed	kg	3,500	150	525,000	500	4,500	2,250,000	55	7,500	412,500
- Manure	kg	70	8	560	70	10	700	70	10	700
- Nitrogen	kg	2,200	120	264,000	2,200	100	220,000	2,200	0	0
- Phosphate	kg	3,000	10	30,000	3,000	50	150,000	3,000	40	120,000
- Potassium	kg	2,200	70	154,000	2,200	80	176,000	2,200	0	0
- Chemicals	lit	40,000	3	120,000	40,000	2	80,000	40,000	0	0
2.3 Machinery	hrs	16,700	15	250,500	16,700	18	300,600	15,000	5	75,000
2.4 Irrigation	0%			0			0			0
2.5 Others	5%			94,200			184,400			56,700
3. Net Income				4,881,740			2,942,300			420,100

Table N.40 Financial Crop Budget under With-Project

	Unit	Irrigated Winter-Spring Paddy			Irrigated Summer-Autumn Paddy			Irrigated 3rd Paddy		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,500	5,500	8,250,000	1,500	4,800	7,200,000	1,500	4,300	6,450,000
2. Production Cost				2,720,600			2,456,300			2,319,200
2.1 Labour	man day	3,000	100	300,000	3,000	100	300,000	3,000	100	300,000
2.2 Input				1,519,000			1,344,000			1,273,000
- Seed	kg	2,000	150	300,000	2,000	140	280,000	2,000	130	260,000
- Manure	kg	70	700	49,000	70	600	42,000	70	500	35,000
- Nitrogen	kg	2,200	180	396,000	2,200	160	352,000	2,200	140	308,000
- Phosphate	kg	3,000	130	390,000	3,000	110	330,000	3,000	110	330,000
- Potassium	kg	2,200	120	264,000	2,200	100	220,000	2,200	100	220,000
- Chemicals	lit	40,000	3	120,000	40,000	3	120,000	40,000	3	120,000
2.3 Machinery	hrs	16,700	18	300,600	16,700	17	283,900	16,700	16	267,200
2.4 Irrigation	6%			495,000			432,000			387,000
2.5 Others	5%			106,000			96,400			92,000
3. Net Income				5,529,400			4,743,700			4,130,800

	Unit	Irrigated Maize			Irrigated Groundnuts			Irrigated Soybeans		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	1,330	4,500	5,985,000	4,260	2,000	8,520,000	4,150	1,800	7,470,000
2. Production Cost				2,168,020			2,031,490			2,043,300
2.1 Labour	man day	3,000	70	210,000	3,000	70	210,000	3,000	80	240,000
2.2 Input				1,312,420			1,037,490			1,078,700
- Seed	kg	2,500	160	400,000	2,300	170	391,000	2,400	180	432,000
- Manure	kg	70	6	420	70	7	490	70	10	700
- Nitrogen	kg	2,200	140	308,000	2,200	70	154,000	2,200	70	154,000
- Phosphate	kg	3,000	110	330,000	3,000	80	240,000	3,000	80	240,000
- Potassium	kg	2,200	70	154,000	2,200	60	132,000	2,200	60	132,000
- Chemicals	lit	40,000	3	120,000	40,000	3	120,000	40,000	3	120,000
2.3 Machinery	hrs	16,700	12	200,400	16,700	12	200,400	16,700	12	200,400
2.4 Irrigation	6%			359,100			511,200			448,200
2.5 Others	5%			86,100			72,400			76,000
3. Net Income				3,816,980			6,488,510			5,426,700

	Unit	Irrigated Tobacco			Irrigated Sugarcane (average annual cost)			Irrigated Pineapple (average annual cost)		
		Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha	Price VDN	Q'ty	Amount VDN/ha
1. Gross Income	kg	7,000	1,700	11,900,000	200	60,000	12,000,000	750	20,000	15,000,000
2. Production Cost				3,367,700			5,369,470			4,735,300
2.1 Labour	man day	3,000	250	750,000	3,000	230	690,000	3,000	260	780,000
2.2 Input				1,476,700			3,420,770			3,522,000
- Seed	kg	3,500	180	630,000	500	5,000	2,500,000	55	26,000	1,430,000
- Manure	kg	70	10	700	70	11	770	70	0	0
- Nitrogen	kg	2,200	180	396,000	2,200	190	418,000	2,200	260	572,000
- Phosphate	kg	3,000	10	30,000	3,000	60	180,000	3,000	125	375,000
- Potassium	kg	2,200	100	220,000	2,200	110	242,000	2,200	375	825,000
- Chemicals	lit	40,000	5	200,000	40,000	2	80,000	40,000	8	320,000
2.3 Machinery	hrs	16,700	18	300,600	16,700	19	317,300	16,700	10	167,000
2.4 Irrigation	6%			714,000			720,000			42,800
2.5 Others	5%			126,400			221,400			223,500
3. Net Income				8,532,300			6,630,530			10,264,700

Table N.41 Farm Household Budget Analysis

	Without Project Condition			With Project Condition			Increment 10 ³ VND
	Unit Net Income 10 ³ VND	Cropped Area ha	Total Income 10 ³ VND	Unit Net Income 10 ³ VND	Cropped Area ha	Total Income 10 ³ VND	
Higher Land Position (Cropping Pattern A)	<i>Farm Size: 0.33 ha</i>			<i>Farm Size: 0.33 ha</i>			
1. Total Gross Income			9,288			12,659	2,758
1.1 Farm Income		0.585 ha	5,198		0.781 ha	8,569	2,758
1) Irrigated Paddy	6,602	0.123 ha	812	7,412	0.565 ha	4,188	3,376
Upland Crops	5,667	0.006 ha	34	6,830	0.159 ha	1,086	1,052
Perennial Crops	-	0.000 ha	0	12,368	0.057 ha	705	705
2) Rainfed Paddy	5,250	0.120 ha	630	-	0.000 ha	0	-630
Upland Crops	2,736	0.216 ha	591	-	0.000 ha	0	-591
Perennial Crops	4,508	0.120 ha	541	-	0.000 ha	0	-541
3) Livestocks			2,590			2,590	0
1.2 Off-Farm Income			4,090			4,090	0
2. Household Expenses			3,265			3,825	560
Farm Production Cost			1,735			2,295	560
Living Expenses			1,530			1,530	0
3. Net Reserve and Other Expenses			6,023			8,834	2,198
Medium Land Position (Cropping Pattern B)	<i>Farm Size: 0.30 ha</i>			<i>Farm Size: 0.30 ha</i>			
1. Total Gross Income			7,861			10,004	1,596
1.1 Farm Income		0.514 ha	4,791		0.704 ha	6,934	1,596
1) Irrigated Paddy	6,938	0.418 ha	2,900	7,411	0.509 ha	3,772	872
Upland Crops	4,917	0.024 ha	118	6,819	0.144 ha	982	864
Perennial Crops	-	0.000 ha	0	12,353	0.051 ha	630	630
2) Rainfed Paddy	5,238	0.021 ha	110	-	0.000 ha	0	-110
Upland Crops	2,216	0.051 ha	113	-	0.000 ha	0	-113
Perennial Crops	-	0.000 ha	0	-	0.000 ha	0	0
3) Livestocks			1,550			1,550	0
1.2 Off-Farm Income			3,070			3,070	0
2. Household Expenses			3,321			4,035	714
Farm Production Cost			1,791			2,505	714
Living Expenses			1,530			1,530	0
3. Net Reserve and Other Expenses			4,540			5,969	882
Lower Land Position (Cropping Pattern C)	<i>Farm Size: 0.25 ha</i>			<i>Farm Size: 0.25 ha</i>			
1. Total Gross Income			9,576			10,310	734
1.1 Farm Income		0.480 ha	6,166		0.502 ha	6,900	734
1) Irrigated Paddy	7,078	0.373 ha	2,640	7,854	0.403 ha	3,165	525
Upland Crops	5,043	0.023 ha	116	6,919	0.099 ha	685	569
Perennial Crops	-	0.000 ha	0	-	0.000 ha	0	0
2) Rainfed Paddy	5,245	0.053 ha	278	-	0.000 ha	0	-278
Upland Crops	2,645	0.031 ha	82	-	0.000 ha	0	-82
Perennial Crops	-	0.000 ha	0	-	0.000 ha	0	0
3) Livestocks			3,050			3,050	0
1.2 Off-Farm Income			3,410			3,410	0
2. Household Expenses			3,868			4,046	178
Farm Production Cost			2,338			2,516	178
Living Expenses			1,530			1,530	0
3. Net Reserve and Other Expenses			5,708			6,264	556

Table N.42 Irrigation Fee by Type of Irrigation in Binh Dinh Province (1/2)**I. Plain Area****1. Gravity irrigation (In case paid by paddy)**

Unit: kg/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	265	300	150	715
Area 2	230	270	135	635
Area 3	200	240	100	540

2. Gravity irrigation (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	331,250	375,000	187,500	893,750
Area 2	287,500	337,500	168,750	793,750
Area 3	250,000	300,000	125,000	675,000

3. Semi-gravity irrigation (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	248,438	281,250	140,625	670,313
Area 2	215,625	253,125	126,563	595,313
Area 3	187,500	225,000	93,750	506,250

4. Irrigation by small temporary weir (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	231,875	262,500	131,250	625,625
Area 2	201,250	236,250	118,125	555,625
Area 3	175,000	210,000	87,500	472,500

5. Irrigation by temporary weir on main river (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	165,625	187,500	93,750	446,875
Area 2	143,750	168,750	84,375	396,875
Area 3	125,000	150,000	62,500	337,500

6. Irrigation by pump (one step) (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	115,938	131,250	65,625	312,813
Area 2	100,625	118,125	59,063	277,813
Area 3	87,500	105,000	43,750	236,250

7. Irrigation by pump (two steps) (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	82,813	93,750	46,875	223,438
Area 2	71,875	84,375	42,188	198,438
Area 3	62,500	75,000	31,250	168,750

8. Irrigation by electric pump (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	414,063	468,750	234,375	1,117,188
Area 2	359,375	421,875	210,938	992,188
Area 3	312,500	375,000	156,250	843,750

Table N.42 Irrigation Fee by Type of Irrigation in Binh Dinh Province (2/2)

II. Mountainous Area

1. Gravity irrigation (In case paid by paddy)

Unit: kg/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	265	300	150	715
Area 2	230	270	135	635
Area 3	200	240	100	540

2. Gravity irrigation (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	304,750	345,000	172,500	822,250
Area 2	264,500	310,500	155,250	730,250
Area 3	230,000	276,000	115,000	621,000

3. Semi-gravity irrigation (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	228,563	258,750	129,375	616,688
Area 2	198,375	232,875	116,438	547,688
Area 3	172,500	207,000	86,250	465,750

4. Irrigation by small temporary weir (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	213,325	241,500	120,750	575,575
Area 2	185,150	217,350	108,675	511,175
Area 3	161,000	193,200	80,500	434,700

5. Irrigation by temporary weir on main river (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	152,375	172,500	86,250	411,125
Area 2	132,250	155,250	77,625	365,125
Area 3	115,000	138,000	57,500	310,500

6. Irrigation by pump (one step) (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	106,663	120,750	60,375	287,788
Area 2	92,575	108,675	54,338	255,588
Area 3	80,500	96,600	40,250	217,350

7. Irrigation by pump (two steps) (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	76,188	86,250	43,125	205,563
Area 2	66,125	77,625	38,813	182,563
Area 3	57,500	69,000	28,750	155,250

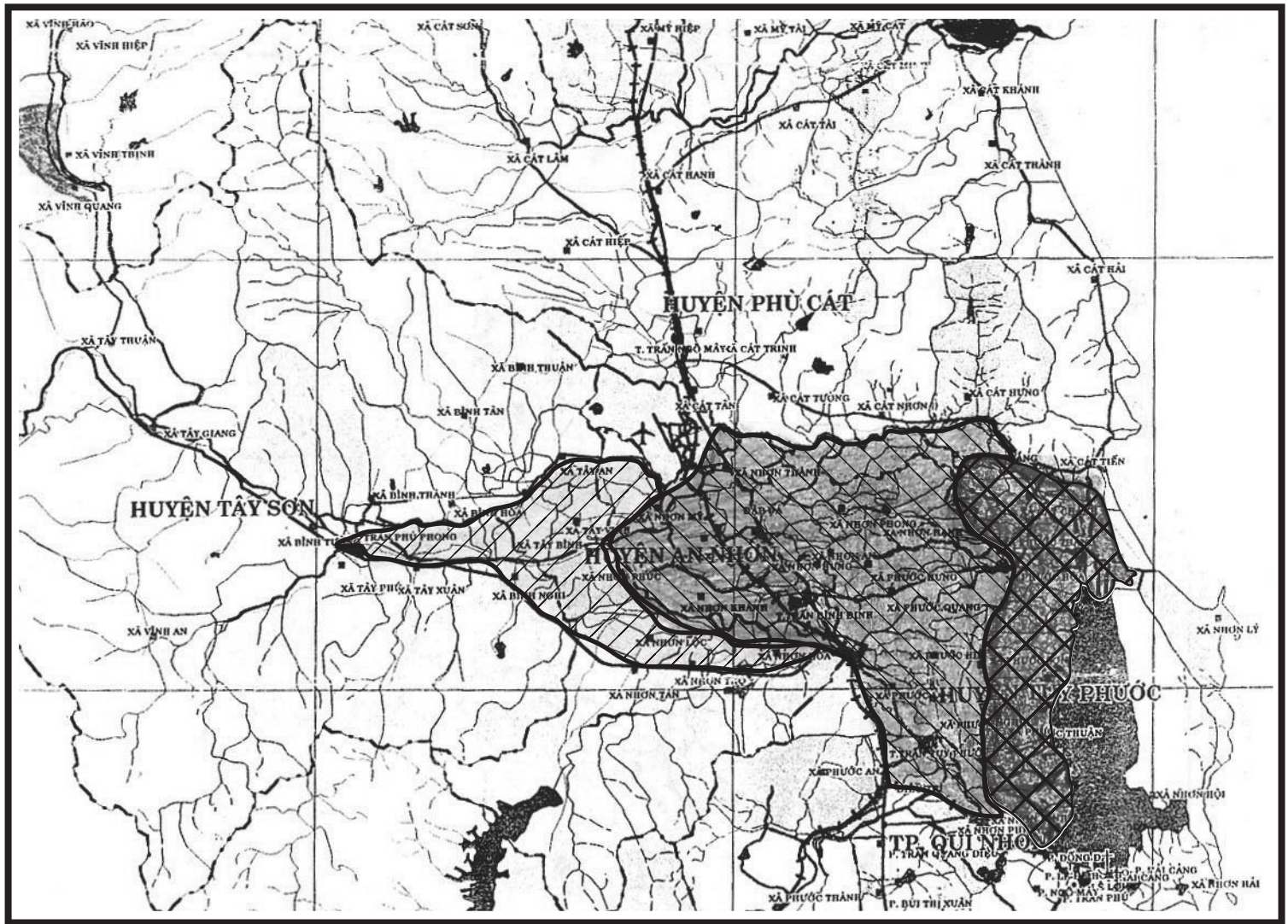
8. Irrigation by electric pump (Paid by money)

Unit: dong/ha/crop

Irrigation area	Winter-Spring Crop	Summer-Autumn Crop	Winter Crop	Annual Total
Area 1	380,938	431,250	215,625	1,027,813
Area 2	330,625	388,125	194,063	912,813
Area 3	287,500	345,000	143,750	776,250

Source: Decision of Irrigation Fee, 23 April 2001, Binh Dinh Provincial People's Committee+A34

Note: Areas 1, 2, and 3 of irrigation area is also fixed by suitability for cultivation.






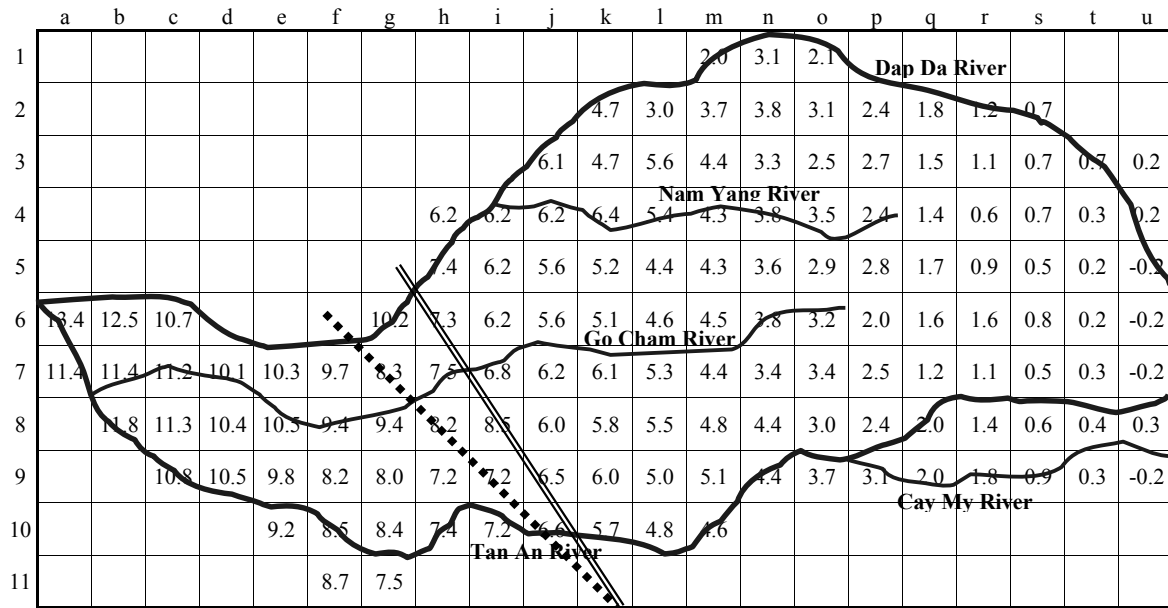
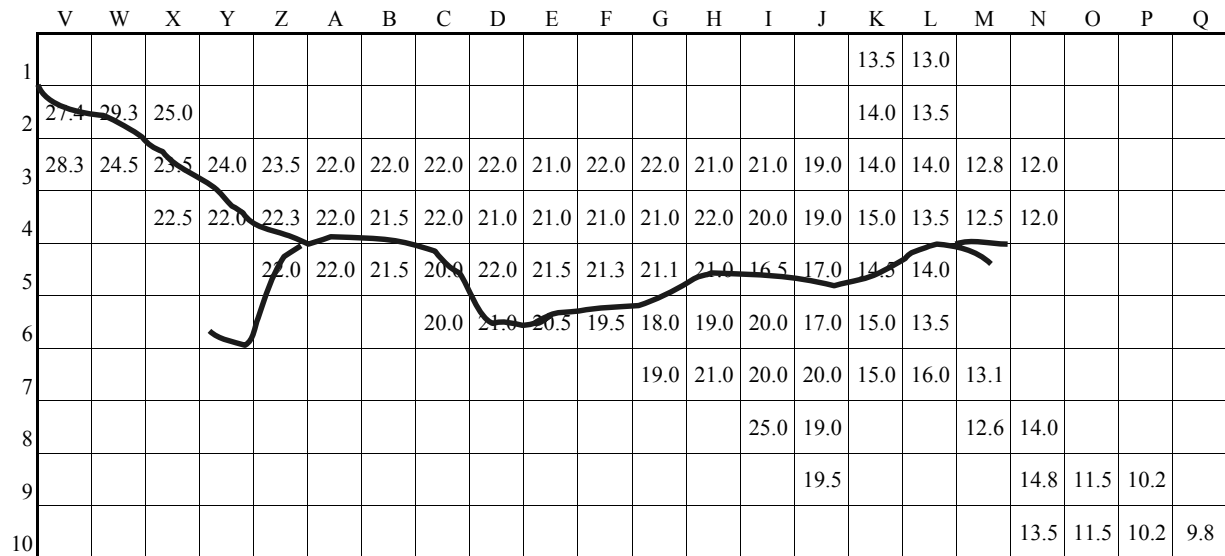
-  Frequently flood area: almost every year
-  Average flood area: every 2 - 3 year
-  Large flood area: every 5 year

Figure N.1 Flood Prone Areas of Kone River Basin



Kone River Delta (Downstream Area)



Midstream Area (Tay Son - Binh Thanh)

Note: 24.5 : Number shows average elevation of farmland taken from a topographic map of 1:25,000 and/or 1:50,000

Figure N.2 Block Division and Average Elevation of Kone River Delta

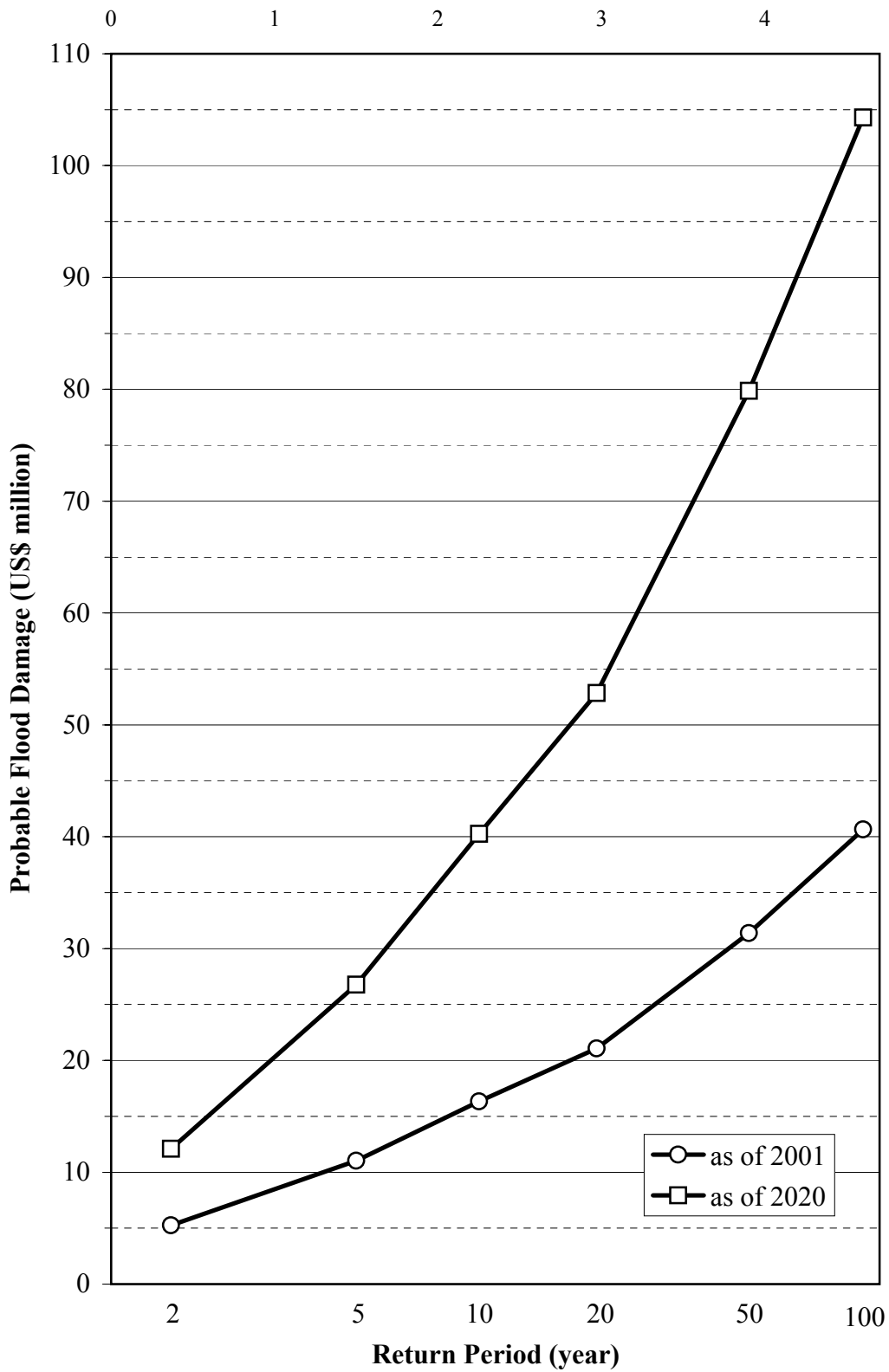


Figure N.3 Flood Magnitude and Probable Flood Damage (Without Project)

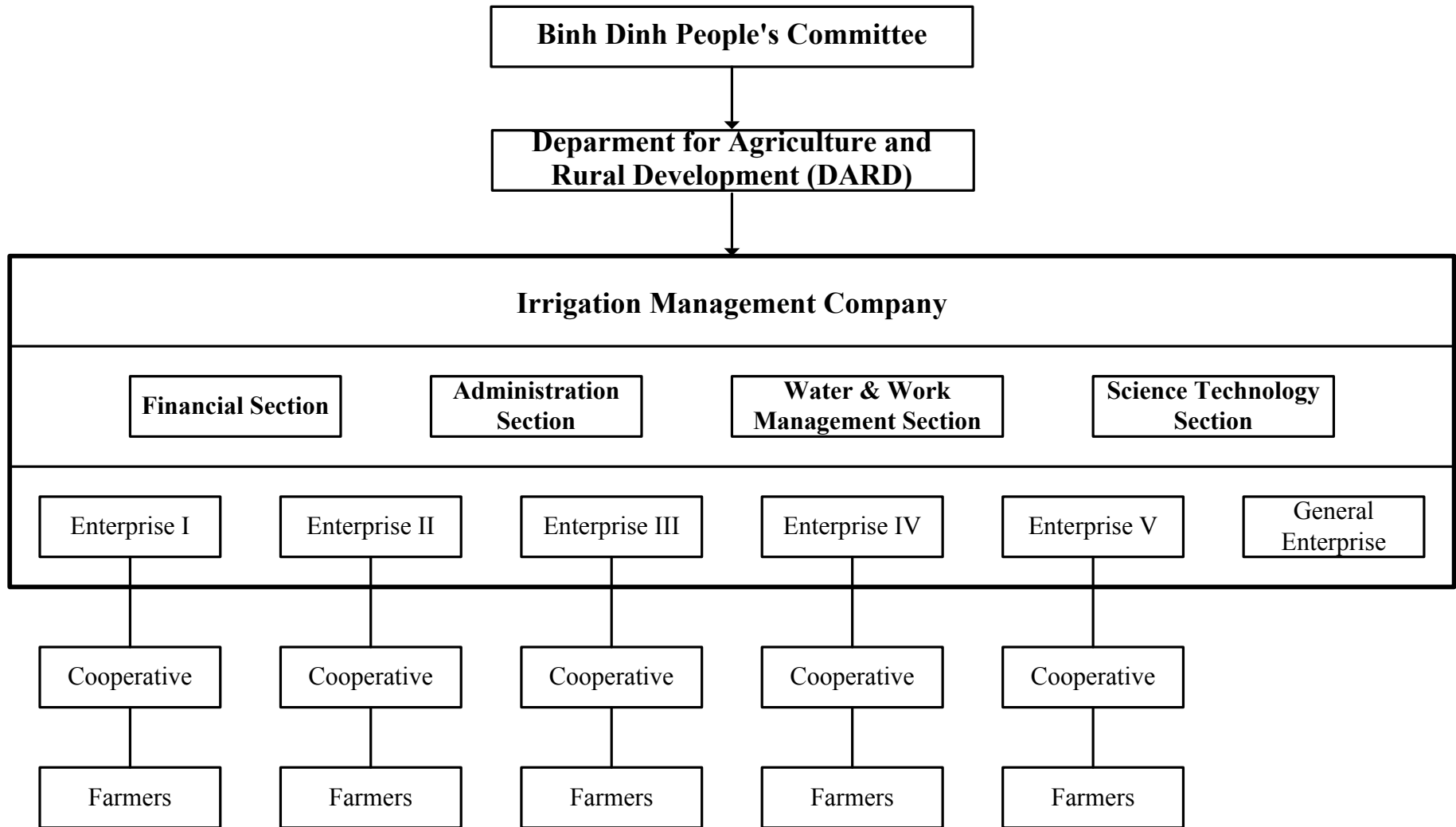


Figure N.4 Administrative Structure of Binh Dinh Irrigation Management Company