APPENDIX E

PROJECT EVALUATION

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CHAPTER I PROJECT BENEFIT IN FINANCIAL TERMS

1.1 Flood Mitigation Benefit

Flood control benefit is defined as the damage reduction by the proposed project. In this feasibility study, the benefit structure is the same as discussed in the master plan study. It consists of direct damages and indirect damage. The direct damages are broken down as follows: (a)agricultural production from irrigated fields and rainfed fields; and (b) housing units and their household effects; (c) industrial facilities, classified into retail and wholesale stores and manufacturing establishments, damageable assets of which comprise their buildings, machinery and equipment, and inventory stocks; and (d) infrastructure.

The infrastructure is classified into two major categories in general: (i) social infrastructure and (ii) physical infrastructure, as mentioned in Section 5.1 of Appendix C. Among the social infrastructures, educational and medical facilities were identified in the direct damage in this study. Other social structures such as religious, sports and recreation facilities are existing in the basin, though they are not enumerated in this study. The physical infrastructures in the basin include roads, water supply, electricity, telephone, irrigation facilities and river facilities. The flood damage of these physical infrastructures was assumed to be 20% of the above direct damages, referring to the similar projects in the Philippines.

Indirect damages comprise (a) opportunity losses of business and production activity, (b) emergency activities, (c) medical care and cure for flood victims and (d) prevention activities against crimes. The indirect damage was assumed to be 10% of the above direct damages.

The direct damages are estimated as a product of the number of facilities inundated by flood in affected areas, an economic value of inundated property and a damage rate in accordance with inundation depth. The number of facilities inundated and the water depth in the area were already identified in the master plan study. The financial values of the respective facilities should be updated in the feasibility study. The values of the respective products and facilities are calculated applying price index of 1.00 between August 1996 and June 1997, which was assumed through consumer price index (CPI) in Region I. Then, the market values have kept the same level between the master plan stage and the feasibility study stage. The financial values of damageable crop fields and facilities are calculated in the table below.

Damageable Property	Unit	Production, Durable Assets (Building, Equipment, etc.)	Movable (Household Effects, Inventory Stock, etc.)
Irrigated Field	P/ha	18,000	-
Rainfed Field	P/ha	13,700	-
Housing Unit	P/Unit	50,000	38,000
Shopping Store	P/Unit	15,000	210,000
Factory	P/Unit	53,000	65,000
All Types of School	P/Unit	1,500,000	250,000
Hospital	P/Unit	15,700,000	3,800,000
Barangay Health Station	P/Unit	362,500	300,000
Rural Health Unit	P/Unit	1,040,000	600,000

The benefits, i.e., reduction of flood damages, by return period is estimated in Table E.1.1 for the entire objective projects and in Table E.1.2 for the respective component schemes. The benefits were estimated under the flood occurrence intervals, i.e., 2, 5, 10, 25, 50 and 100 years, as shown in the tables. In calculating the annual average benefit, reference should be made to probability or frequency of flooding on the basis of flood occurrence intervals. The annual benefit of the entire objective project was P244 million in total. The table below shows the annual benefits of the objective projects.

(Unit: Million Pesos in Financial Terms)

Potential Flood Area	Under Present Condition
Poblacion of Laoag	16.1
Poblacion of San Nicolas	4.3
Poblacion of Dingras	6.5
Cura River Basin	82.4
Solsona River Basin	53.4
Madongan River Basin	57.6
Papa River Basin	24.1
Entire Project	244.4

1.2 Benefit of Land Use Enhancement

1.2.1 Land Loss Prevention

As discussed in the master plan study, the cultivated lands have been washed out annually by sedimentation and flood inundation disasters in the upper Laoag river basin. The land areas lost in the objective project areas were as follows: (1) 64 ha for the last 20 years or 3.2 ha per year on average in Papa river basin; (2) 142 ha or 7.1 ha per year in Madongan river basin; (3) 241 ha or 12 ha per year in Solsona river basin; and (4) 584 ha or 29.2 ha per year in Cura river basin. Once the sabo and flood control projects had been introduced in the basin, these losses could have been eliminated. Thus, these losses are considered as project benefit. This benefit was estimated at P4.1 million per annum in financial terms as shown in Table E.1.3, on the assumption that the crops were cultivated under the prevailing cropping schedule in the basin.

The crop production of these expected washed-out lands was already accounted in flood mitigation benefits. Thus, these benefits have to be subtracted from the land loss prevention benefits because of avoiding double account. The annual economic benefits of land loss prevention were estimated at P3.7 million per annum, as shown in Table E.1.3.

1.2.2 Land Use Restoration

After the completion of the objective projects, the farmers in the beneficial areas get the circumstances free from flood disasters and could be motivated to develop the agricultural lands on their own initiative, which used to be damaged by the flood disasters. These total areas were estimated at 1,830 ha, broken down as follows: 820 ha for grazing fields; 510 ha for upland crop fields; and 500 ha for lowland crop fields, as shown in Table E.1.4. The agricultural activities could be expected in these fields, if the proposed project was implemented in the basins. Thus, the agricultural production could be considered as one of land use enhancement benefits.

This benefit was estimated at P8.5 million per annum in financial terms as shown in Table E.1.4, on the assumption that the crops were cultivated during wet season only. Hence, livestock production in the grazing fields was so small that its benefit was neglected.

CHAPTER II ECONOMIC EVALUATION

2.1 Basic Conditions for Economic Evaluation

Economic evaluation is carried out to ascertain the economic viability by comparing economic benefit and cost. As a method of project evaluation, economic internal rate of return (EIRR) is utilized as a tool of assessing economic viability to judge whether the proposed project is to be worth being invested. Besides EIRR, net present value (NPV) and benefit-cost ratio (B/C) are presented as supplementary indices, for which cost and benefit are discounted at 15% per annum.

In economic evaluation, the values of cost and benefit must be counted in real economic valuation. Economic cost and benefit differ from financial ones in the sense of value judgment since the former is valued at real resource cost and the latter is resource cost valued at market prices. Thus, to estimate the economic cost of the proposed project, the financial cost which was estimated in Appendixes D has to be converted by using conceivable adjustment. In the same manner, the economic benefit should be converted from the financial ones which were estimated in Chapter 1.

In estimating the economic cost and benefit, the following criteria and assumptions are applied to transfer the financial values of the project cost and benefit to the economic ones in this feasibility study.

2.1.1 Conversion Factors and Elements for Real Economic Values

(1) Transfer Payments

Market values are usually distorted by transfer payments such as taxes and subsidies. These transfer payments are transferred to the government which acts on behalf of the society. Then, they should not be treated as cost. These have to be eliminated from the market values of cost and benefit as a whole. In the Philippines, the taxes concerning to the construction works are enumerated as follows: the value added tax (VAT), excise tax, income tax, customs duties, tax on sand ,gravel and quarry resources, and various local taxes, etc. The overall tax rates on major materials and services are shown in Table E.2.1

(2) Shadow Wage

Wages of skilled workers are considered to reflect an opportunity cost of labor, because the workers are usually are shortage in the markets. Therefore, the shadow wage rate of skilled workers is set up as 1.0. On the other hand, unskilled workers are in excess in general, since the region including the project basin has excess workers in condition of unemployment and underemployment. Thus, the shadow wage rate of unskilled workers is assumed at 0.6 of legislated wage rate.

(3) Shadow Foreign Exchange

It is said that the foreign exchange rate has some distortions in the prevailing exchange rate due to balance of payments disequilibrium and protection structures in the country. In this feasibility study, the shadow exchange rate is assumed at 1.2 of the prevailing exchange rate, as recommended to use in "ICC Project Evaluation Procedures and Guidelines" by NEDA. This rate is applied to the imported materials and services. Incidentally, the import portions of major construction materials are enumerated in Table E.2.2.

(4) Conversion Factors

As discussed in Appendix D, the material costs were nominally segregated into the following proportion of foreign and local portions, referring to NEDA information.

	Item	Local Portion	Foreign Potion
1.	Materials		
	Cement	0.3	0.7
	Aggregate (Coarse and Fine)	0.6	0.4
	Steel	0.2	0.8
	Fuel and Lubricant	0.3	0.7
	Lumber	0.6	0.4
2.	Machinery and Equipment Rental	0.3	0.7
3.	Labor	1.0	0.0
4.	Administration Cost	1.0	0.0
5.	Engineering Cost	0.1	0.9

In simplifying conversion from financial market value to real economic value, conversion factors are set up in consideration of the elements discussed above, i.e., transfer payments, shadow wage rate and shadow foreign exchange. Taking into account of the above foreign and local compositions, the conversion factors corresponding above cost estimation were summarized as follows. The details of the factors were broken down in Table E.2.3.

	Item	Local/Foreign Separate Estimate		Local/Foreign Combined Estimate
		Local Portion*1	Foreign Potion	
1.	Materials			
	Cement	0.53	1.04	0.88
	Aggregate (Coarse and Fine)	0.68	1.06	0.83
	Steel	0.24	1.06	0.90
	Fuel and Lubricant	0.05	1.21	0.86
	Lumber	0.80	1.04	0.90
	Others	0.72	1.05	0.89
2.	Machinery and Equipment Rental	0.57	1.11	0.85
3.	Labor			
	Skilled	0.93	-	0.93
	Unskilled	0.60	-	0.60
4.	Indirect Costs			
	Overhead, contingencies and miscellaneous (OCM)	0.86	-	0.86
	Profit	0.65	-	0.65
	Value Added Tax*2	0.00	-	0.00
5.	Government Expenditure*3	0.95	-	0.95
6.	Engineering Service*4	0.00	1.22	1.10

Note: *1 Including all taxes national and local in the Philippines
*2 Imposed on item numbers of (2) and (3) only in this form.
*3. For engineering and administrative overhead
*4 Detailed design and supervising services by foreign consultants

(5) Land Value

Market price of land has peculiar characteristics as compared with other commodities, especially in urban areas. Land price should be evaluated on the basis of productivity of the land for productive plots such as crop cultivation and balance of supply and demand for non-productive land such as residential plots. On the other hand, land price is sometimes distorted by speculation in future escalation expectation and by social prestige. In this study, most lands which would be expropriated for riverbeds and dams are utilized for agricultural cultivation. Then, the value of these lands will be evaluated through crop production lost by the expropriation as negative benefit.

2.1.2 Schedule and Evaluation Period

(1)	Base Year	Beginning of 1999
(2)	Construction Period	The year of 1999 for detailed design, and four years for construction of major works between 2000 and 2003
(3)	Disbursement Schedule	Uniform distribution of project costs during construction period
(4)	Economic Life	50 years after the completion of the project
(5)	Evaluation Period	50 years after the completion of the major sabo and flood control works (2004 - 2053)
(6)	Timing of Benefits Accruing	In proportion to construction works already completed

2.1.3 Other Criteria

(1)	Price Levels	Cost and benefits of the project were set at the end of June, 1997. According to consumer price index (CPI) in Region I, inflation was almost nothing between August 1996 and June 1997, so the values of materials and services estimated in the master plan were assumed to keep the same level.
(2)	Social Discount Rate	15% per annum

2.1.4 Future Damageable Assets

The socio-economic situation in Region I will definitely be improved in accordance with the growth of national economy, and that in Laoag river basin will also be improved in the future. Hence, the damageable assets could increase along with the growth of socio-economic conditions.

The future flood mitigation benefits are estimated on the basis of socio-economic projection. They are based on population increase, improvement of people's living standard, growth of economic activity in various industries and expansion of infrastructures in the basin area. All these damageable facilities and production activities could be expected to increase in the future. In principle, the future benefits are estimated on the basis of the medium growth projection. For the other growth scenarios, that is, high and low scenarios discussed in Section 7.3 of Appendix A in Part 1, the influence of these scenarios are tested in sensitivity analysis.

2.2 Economic Benefit

2.2.1 Flood Mitigation Benefit

The flood mitigation benefits are already estimated in Chapter 1, although they were in financial terms. These benefits are converted into real economic values applying the conversion factors, as discussed in the previous section. The conversion factors for respective damageable facilities are set up as follows:

Facility	Conversion Factor (CF)	Applied CF
Housing Unit	0.83	0.83
Shopping Store	0.84	
Factory	0.82	
Educational Facility	0.83	
Medical Facility	0.84	

These conversion factors are calculated in Table E.2.4, which were led through estimates of typical facilities. The conversion factors ranged from 0.82 to 0.84 as shown in the table above, so 0.83 is used for the conversion factors in economic benefit calculation. For references, the original estimates of the respective facilities are listed in Table E.2.5. The conversion factor of household effects and inventory stocks are assumed to be the same as those of the corresponding facilities, i.e., 0.83. Applying these conversion factors, the economic values of damageable facilities and crop fields are calculated in the table below. The crop production in irrigated and rainfed fields are estimated in economic terms in Table C.5.7 and C.5.9 in Appendix C of Part I.

Damageable Property	Unit	Production, Durable Assets (Building, Equipment, etc.)	Movable (Household Effects, Inventory Stock, etc.)
Irrigated Field	P/ha	17,200	-
Rainfed Field	P/ha	11,300	-
Housing Unit	P/Unit	41,500	31,500
Shopping Store	P/Unit	12,500	174,000
Factory	P/Unit	44,000	54,000
All Types of School	P/Unit	1,245,000	207,500
Hospital	P/Unit	13,031,000	3,154,000
Barangay Health Station	P/Unit	301,000	250,000
Rural Health Unit	P/Unit	863,000	498,000

The economic benefits, i.e., reduction of flood damages, by return period is estimated in Table E.2.6 for the entire objective projects and in Table E.2.7 for the respective schemes. The annual benefit of the entire objective project is estimated at P204 million in economic terms. Other benefits are summarized in the table below.

(Unit: Million Pesos at Economic Terms)

Potential Flood Area	Under Present Condition	Under Future Condition
Poblacion of Laoag	14.4	20.3
Poblacion of San Nicolas	3.6	4.9
Poblacion of Dingras	5.4	7.5
Cura River Basin	68.3	94.8
Solsona River Basin	44.3	61.8
Madongan River Basin	47.8	64.6
Papa River Basin	20.0	27.0
Total	203.8	280.9

The annual benefits under future condition were also estimated in Table E.2.6 and E.2.7. The benefits were assumed to increase in proportion to population growth, improvement of both people's living standard and increase of economic activity in industrial production annually. The growth rates of population and economics in Region I were discussed in Chapter 7 of Appendix A in Part 1. The annual benefits of the objective schemes are summarized in the table of the previous page. Hence, the future values show the full benefits just after the completion of the project on the assumption that the project would be constructed between 2000 and 2003.

The flood mitigation benefits are assumed to accrue in proportion to the completion of the construction works, even if the construction is a part of them. The full benefits would accrue immediately after the completion of the entire construction works. Under present condition, then, the annual benefit of P204 million is expected to accrue in 2004 and to continue after then. The benefit under the future condition is expected to increase in proportion to the economic growth in the basin annually, although they are assumed to keep constant after the target year 2020.

In this feasibility study, the benefits by sabo dams are assumed to reduce from the full benefit in the future as follows from the conservative point of view on economic efficiency.

(1) For 10 years after the completion of the sabo dams, the full benefit is expected since the sabo dam functions fully, even if only No.1 dams is constructed in the case of Cura, Labugaon and Solsona river basins.

(2) During 11th to 20th year, the full benefit is expected in the case of Papa and Madongan river basins. In Cura, Labugaon and Solsona river basins, however, the effect of sabo dams is subtracted from the full benefit.

(3) Beyond 21st year, the effect of sabo dams is subtracted from the full benefit, which is assumed in proportion to the ratios of respective construction costs.

Taking the above reduction of benefit, the benefit rates of flood mitigation for the respective river basins are calculated as follows.

	Papa River Basin	Madongan River Basin	Solsona River Basin	Cura River Basin
10 Years after Completion	100%	100%	100%	100%
11th to 20th Year	100%	100%	80%	66%
Beyond 21st Year	75%	79%	80%	66%

2.2.2 Land Use Enhancement

(1) Land Loss Prevention

As discussed in the Chapter 1, the benefit of land loss prevention was estimated at P3.7 million as net benefit in financial terms. In economic terms, the benefit was estimated at P2.9 million per annum, as shown in Table E.2.8. It comprises as follows: P0.18 million in Papa river basin, P0.41 million in Madongan river basin, P0.68 million in Solsona river basin and P1.66 million in Cura river basin.

(2) Land Use Restoration

As discussed in the Chapter 1, the benefit of land use restoration was estimated at P8.4 million in financial terms. In economic terms, the benefit was estimated at P5.2 million per annum, as shown in Table E.2.9. It composes of the following four basins as follows: P0.03 million in Papa river basin, P2.51 million in Madongan river basin, P0.51 million in Solsona river basin and P2.19 million in Cura river basin.

2.2.3 Negative Benefit

For the implementation of the project, some areas have to be expropriated for riverbeds, dykes and sabo dams. These areas include some agricultural lands for cropping and some dwelling units. Crop production can not be carried on when the construction works begin. This inactivity is considered as negative benefits of the project. The dwelling units have to be demolished and be resettled in other housing sites when the construction works begin. These resettlement expenses are treated as a part of the project costs.

The negative benefits of expropriated crop lands were estimated on the assumption that all expropriated crop lands were rainfed fields where palay was cultivated. Then, the unit benefit was estimated at P2,300 per ha, referring to Table C.5.9 in Appendix C of Part 1. These negative benefit for the respective schemes was estimated at P0.04 million per annum under present condition. Under future condition, the unit yield of palay was assumed to be a double of the present yield (2.4 ton/ha) in the year 2020.

2.3 Economic Cost

The financial construction cost consists of the following major items:

(a) Main construction cost;

(b) Compensation cost;

(c) Government administration cost;

(d) Engineering service cost;

(e) Physical contingency cost; and

(f) Price Contingency cost.

To simplify the procedure of conversion, the main works in the main construction cost are segregated into several work types in terms of component schemes, i.e., sabo dams, alluvial fan river improvement and Laoag-Bongo river improvement. These work types are itemized in Appendix D, which are composed of three types of sabo dams, 15 types of alluvial fan improvement schemes and 10 types of Laoag-Bongo river improvement schemes. The respective work types of construction cost comprise (i) materials, (ii) machinery and equipment rental, (iii) labor and (iv) indirect costs. The conversion factors of these cost items from financial cost to economic cost were discussed in Section 2.1.1. Then, the economic cost of the

work types is converted from the financial cost applying the conversion factors in Table E.2.3, which is tabulated in Table E.2.11. As a result, the respective work types can have overall conversion factors by means of comparing the economic cost against the corresponding financial cost. The results of these conversion factors are shown in Table E.2.12.

Using the conversion factors of the work types, the economic cost of the objective project comprising sabo dams, alluvial fan river improvement and Laoag-Bongo river improvement is calculated from the corresponding financial cost. Furthermore, the project consists of five sabo dams, four river improvement schemes in alluvial fan area and three river improvement schemes in Laoag-Bongo river basin. The details of the conversion process are specified in Table E.2.12. As a result, the overall conversion factors for the respective schemes are calculated as shown in the table below. They are summarized as follows.

(Unit: Million Pesos for cost figures)

Objective project	Financial Cost	Economic Cost	Conversion Factor
Sabo Dams	232.1	181.8	0.78
Alluvial Fan River Improvement	836.7	658.1	0.79
Laoag-Bongo River Improvement	133.3	110.2	0.83
Total	1,202.1	950.1	0.79

The entire cost of the objective project is calculated applying the above conversion factors for main works and the conversion factors in Table E.2.3 for the other cost items such as government administration cost, engineering service cost and physical contingency cost. The land acquisition cost is evaluated by negative benefit, as discussed in the previous Section. The house resettlement cost is converted using the conversion factor of housing unit (0.83) which is shown in Table E.2.3. The price contingency cost is excluded from economic cost. As a result, the entire economic cost is calculated as P1,592 million, as shown in Table E.2.13. Since the financial total cost is P1,911 million, the economic construction cost corresponds to 83% of the financial one, as shown in the table.

The construction cost is disbursed in compliance with the construction schedule which is discussed in Appendix D. The disbursement schedule of economic costs is tabulated in Table E.2.14. The table below shows the annual amounts for the construction period.

Year	Annual Disbursement (Million Pesos)
1999	104
2000	382
2001	385
2002	379
2003	342
Total	1,592

The operation and maintenance (O&M) cost is annually required during the economic life of the objective project. The O&M cost is assumed to be 0.5% of the total direct construction cost of river improvement schemes. The annual cost for O&M of the project amounts to P4.6 million after the project is completed in 2003.

2.4 Economic Evaluation

2.4.1 Economic Viability of Objective Project

In this section, the objective project for the feasibility study is examined from the economic point of view. The project includes the seven river basin schemes selected in the previous study. The project is evaluated for the entire project including the whole schemes and for the each scheme of the seven river basins individually.

The construction schedule and the disbursement program of respective schemes are already discussed in the previous Section. The economic benefits were expected to accrue in conformity to the schedule. Their annual benefits under present condition are shown in Table E.1.15 for the entire project and in Table E.1.16 for the respective component schemes of the seven river basins. Those under future condition are shown in Table E.1.17 for the entire project and in Table E.1.18 for the respective component schemes of the seven river basins.

The EIRR of the entire project under future condition is 20.3%, although the EIRRs of the component schemes are ranged from 41.6% of the highest to 10.8% of the lowest. Under present condition, however, the EIRR of the entire project was 12.4%. Other indices of economic evaluation are in the table below. The details of these indices are shown in Table E.2.19 under present condition and in Table E.2.20 under future condition. Considering the economic growth in the future, thus, the objective project is feasible from the economic view point because the EIRR is over 15% of the social discount rate.

Item	EIRR (%)	B/C*1	NPV*1 (Million Pesos)
Under Future Conditions	20.3	1.43	442
Under Present Conditions	12.4	0.82	-190

Note: *1 Discounted at 15%

2.4.2 Sensitivity Test

The cost and benefits are estimated with discretion by respective experts in this feasibility study. In spite of that, some uncertainty still exists in the estimation. In particular, the cases with long implementation period and/or expectation of future growth have high risks in terms of judgment on project viability. In this context, thus, the sensitivity test is introduced in the following aspects, in consideration of sensitive factors for project feasibility.

(1) 10% higher than the cost estimated
(2) 10% lower than the benefits expected
(3) In case of other scenarios of regional economic growth, i.e. high or low scenario as discussed in GRDP projection in Section 7.3 of Appendix A in Part 1.

The influence of the above phenomena was examined as follows. The results were presented under future conditions. Since the EIRRs of the all cases exceeded 18%, the objective project is sufficiently feasible from the economic point of view.

Item	EIRR (%)	B/C	NPV (P. Million)
Base Condition	20.3	1.43	442
(1) 10% Costs Up	18.7	1.30	338
(2) 10% Benefits Down	18.5	1.28	294
(3-1) High Growth Scenario	22.9	1.69	716
(3-2) Low Growth Scenario	19.1	1.32	334

CHAPTER III SOCIAL EVALUATION

3.1 Creation of Job Opportunity and Activation of Regional Economy

The implementation of the proposed project creates opportunities of temporal jobs during the construction period. The requirement of these temporal workers are estimated at 1.42 million man-days in total, which are segregated into 0.52 million man-days of skilled workers and 0.90 million man-days of unskilled workers during the four years between 2000 and 2003. Besides these temporal workers, most construction materials will be supplied from inside and outside of the basin. Moreover, the supporting services and other materials for these construction works are required in the basin. These supporting businesses result in creating another job opportunity, and it will contribute to activation of the regional economy.

3.2 Enhancement of Land Use and Mitigation of Economic Disparity in Basin

There are many depressed areas along the Laoag river, in particular in upper alluvial fan areas along Cura, Labugaon, Solsona, Madongan, Papa and Bongo rivers. Some of these agricultural lands have been washed out for long time. Without the proposed sabo dam and river improvement projects, these land losses could be carried on in the same speed. On the other hand, once the proposed project was implemented in these areas, these lost lands could be restored and rehabilitated to cultivate crops because of no more flood and sedimentation disasters.

These visible benefits were already quantified as tangible benefits in the economic evaluation. People in the upper stream areas in particular have been depressed by these disasters and got damages on their agricultural production. However, the proposed project would give them incentives to restore those lost crop lands actively. These activities could be expected to mitigate economic imbalance within the basin.

3.3 Improvement of Social Amenity and Public Hygiene

People in Laoag river basin have experienced floods habitually, as mentioned in the record of floods. It is clear that people in the project areas tremble with flood and landslide menace, whoever had fear experiences in floods. Besides, the people exposed themselves to danger of serious public hygiene after the flood disaster.

Due to the implementation of the sabo and flood control plan proposed in this study, the people in Laoag river basin will be able to be relieved from the menace of floods and landslides. This would result in the emergence and subsequent pervasion of positive mental climate among inhabitants in the basin. They could enjoy their living conditions and industrial activities with little worries about flood and sedimentation disasters.

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43	The National Internal Revenue Code of the Philippines Annotated	March 1996	National Book Store, Inc.
44	The Fundamentals of Taxation 1993 Edition	June 1993	REX Book Store
45	Understanding the Value Added Tax		Bureau of Internal Revenue
46	1995 Census of Population, Ilocos Norte Population by City/Municipality and by Barangay	Dec. 1996	NSO
47	Updated Regional Development Plan, Region I, 1995-1998	May 1996	Regional Development Council, NEDA Region I
48	Draft Provincial Physical Framework Plan /Comprehensive Provincial Land Use Plan	1997	Provincial Land Use Committee, Province of Ilocos Norte

TABLES

Table E.1.1 Damageable Property, Flood Damage and Flood Control Benefit of Objective Project

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	30,095	37,640	40,403	47,948	54,413	57,743
2 Area Inundated (km^2)	109	122	129	134	143	150
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	6,783	7,828	8,173	8,498	9,153	9,606
b. Rainfed Field	97	102	102	102	147	152
2 Buildings (Nos)						
a. Housing Units	5,943	7,440	7,995	9,515	10,803	11,459
b. Shopping Stores	116	144	150	187	218	232
c. Factories	20	24	26	44	62	76
d. Pre-Schools	6	11	13	16	18	20
e. Elementary Schools	26	36	38	41	45	48
f. Secondary Schools	5	7	9	11	13	13
g. Tertiary Schools	2	3	3	3	4	4
h. Hospitals	0	2	2	3	4	4
i. Barangay Health Stations	1	2	3	3	3	4
j. Rural Health Units	6	9	9	10	11	13
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	252.5	403.0	495.2	613.0	728.6	793.6
a. Agricultural Production	67.0	87.4	95.8	105.9	115.4	124.8
- Irrigated Field	66.3	86.4	94.8	104.8	114.2	123.5
- Rainfed Field	0.7	1.0	1.0	1.1	1.3	1.3
b. Housing Units	95.1	159.6	197.0	251.4	300.5	333.0
c. Industry	10.7	16.1	18.3	21.6	24.6	26.6
- Shopping Stores	10.2	15.5	17.5	20.6	23.3	25.0
- Factories	0.4	0.6	0.8	1.0	1.3	1.5
d. Infrastructure	79.6	139.9	184.1	234.1	288.1	309.2
- Social Infrastructure	34.2	52.7	67.4	79.6	98.2	104.3
. Educational Facilities	28.8	39.9	48.5	56.8	65.9	70.4
. Medical Facilities	5.4	12.8	18.9	22.8	32.3	33.9
- Physical Infrastructure	45.4	87.2	116.7	154.6	189.9	204.8
2. Indirect Damage	24.6	36.7	43.5	52.2	61.0	66.8
3. Total	277.1	439.7	538.7	665.2	789.6	860.4
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	67.6	168.7	212.8	244.4	256.8	263.8

Table E.1.2(1) Damageable Property, Flood Damage and Flood Control Benefit in Poblacion of Laoag

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	2,283	4,402	4,430	6,203	6,677	6,677
2 Area Inundated (km^2)	0.6	1.8	2.5	3.3	3.8	4.1
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	16	76	117	165	175	175
b. Rainfed Field	0	0	0	0	0	0
2 Buildings (Nos)						
a. Housing Units	459	869	875	1,234	1,314	1,314
b. Shopping Stores	28	43	43	57	63	63
c. Factories	4	5	5	5	5	5
d. Pre-Schools	2	5	6	7	8	8
e. Elementary Schools	4	10	10	11	12	12
f. Secondary Schools	1	3	4	5	7	7
g. Tertiary Schools	2	3	3	3	4	4
h. Hospitals	0	1	1	2	2	2
i. Barangay Health Stations	0	0	1	1	1	1
j. Rural Health Units	0	2	2	2	2	2
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	11.3	66.4	113.7	171.3	226.3	240.7
a. Agricultural Production	0.0	0.6	1.2	2.2	2.6	3.1
- Irrigated Field	0.0	0.6	1.2	2.2	2.6	3.1
- Rainfed Field	0.0	0.0	0.0	0.0	0.0	0.0
b. Housing Units	3.9	23.4	41.4	62.3	84.3	89.8
c. Industry	0.9	3.1	4.1	5.1	6.2	6.4
- Shopping Stores	0.8	3.0	3.9	5.0	6.0	6.2
- Factories	0.0	0.1	0.1	0.2	0.2	0.2
d. Infrastructure	6.5	39.3	67.0	101.6	133.3	141.5
- Social Infrastructure	1.3	8.2	13.9	20.7	27.1	28.8
. Educational Facilities	0.8	5.2	8.6	12.8	17.0	17.9
. Medical Facilities	0.5	3.1	5.2	7.9	10.1	10.9
- Physical Infrastructure	5.2	31.1	53.1	80.9	106.2	112.7
2. Indirect Damage	0.5	3.0	5.3	8.0	10.8	11.5
3. Total	11.8	69.5	119.0	179.2	237.1	252.2
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	1.3	7.1	11.7	16.1	18.1	19.3

Table E.1.2(2) Damageable Property, Flood Damage and Flood Control Benefit in Poblacion of San Nicolas

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	1,295	1,851	2,596	5,835	10,499	12,730
2 Area Inundated (km^2)	1.0	1.5	1.8	2.3	5.8	8.3
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	38	69	74	96	413	531
b. Rainfed Field	0	0	0	0	35	40
2 Buildings (Nos)						
a. Housing Units	266	374	526	1,189	2,144	2,588
b. Shopping Stores	7	9	12	26	51	63
c. Factories	1	1	3	21	37	51
d. Pre-Schools	0	0	1	2	2	4
e. Elementary Schools	0	0	0	1	3	5
f. Secondary Schools	0	0	1	2	2	2
g. Tertiary Schools	0	0	0	0	0	0
h. Hospitals	0	0	0	0	1	1
i. Barangay Health Stations	0	0	0	0	0	1
j. Rural Health Units	0	0	0	1	1	2
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	0.9	7.0	17.6	24.6	39.9	49.0
a. Agricultural Production	0.3	0.9	1.3	1.5	2.7	3.4
- Irrigated Field	0.3	0.9	1.3	1.5	2.6	3.3
- Rainfed Field	0.0	0.0	0.0	0.0	0.1	0.1
b. Housing Units	0.2	4.1	11.7	14.9	20.9	25.3
c. Industry	0.2	0.7	1.1	1.8	3.2	4.0
- Shopping Stores	0.2	0.7	1.0	1.6	2.7	3.4
- Factories	0.0	0.0	0.1	0.3	0.4	0.7
d. Infrastructure	0.1	1.2	3.5	6.3	13.2	16.3
- Social Infrastructure	0.0	0.0	0.6	2.2	6.5	8.1
. Educational Facilities	0.0	0.0	0.6	2.0	3.0	4.2
. Medical Facilities	0.0	0.0	0.0	0.3	3.6	3.9
- Physical Infrastructure	0.1	1.2	2.9	4.1	6.7	8.2
2. Indirect Damage	0.1	0.7	1.8	2.5	4.0	4.9
3. Total	1.0	7.7	19.4	27.1	43.9	53.9
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	0.2	1.5	2.9	4.3	5.0	5.5

Table E.1.2(3) Damageable Property, Flood Damage and Flood Control Benefit in Poblacion of Dingras

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	1,176	3,267	4,228	4,228	5,283	5,283
2 Area Inundated (km²)	0.8	2.8	4.8	5.5	7.8	7.8
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	32	256	319	344	561	561
b. Rainfed Field	0	0	0	0	0	0
2 Buildings (Nos)						
a. Housing Units	231	642	832	832	1,031	1,031
b. Shopping Stores	1	4	4	4	4	4
c. Factories	0	3	3	3	5	5
d. Pre-Schools	0	2	2	2	2	2
e. Elementary Schools	0	2	3	4	5	5
f. Secondary Schools	0	0	0	0	0	0
g. Tertiary Schools	0	0	0	0	0	0
h. Hospitals	0	1	1	1	1	1
i. Barangay Health Stations	0	1	1	1	1	1
j. Rural Health Units	0	0	0	0	1	1
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	2.7	12.5	19.7	26.0	37.3	41.8
a. Agricultural Production	0.3	1.5	2.5	3.5	5.2	6.8
- Irrigated Field	0.3	1.5	2.5	3.5	5.2	6.8
- Rainfed Field	0.0	0.0	0.0	0.0	0.0	0.0
b. Housing Units	1.8	3.8	4.8	8.2	11.8	13.7
c. Industry	0.1	0.3	0.3	0.4	0.4	0.5
- Shopping Stores	0.1	0.2	0.3	0.3	0.3	0.4
- Factories	0.0	0.0	0.1	0.1	0.1	0.1
d. Infrastructure	0.4	6.9	12.2	13.9	19.9	20.8
- Social Infrastructure	0.0	4.9	8.9	9.5	13.7	13.9
. Educational Facilities	0.0	1.4	2.7	3.4	4.9	5.1
. Medical Facilities	0.0	3.4	6.2	6.2	8.8	8.8
- Physical Infrastructure	0.4	2.1	3.3	4.3	6.2	7.0
2. Indirect Damage	0.3	1.2	2.0	2.6	3.7	4.2
3. Total	2.9	13.7	21.7	28.6	41.1	46.0
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	0.7	3.2	5.0	6.5	7.2	7.6

Table E.1.2(4) Damageable Property, Flood Damage and Flood Control Benefit in Cura River Basin

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	8,994	10,231	10,552	11,115	11,115	11,115
2 Area Inundated (km^2)	33.5	36.3	37.5	39.0	39.8	40.0
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	2,201	2,521	2,605	2,719	2,736	2,736
b. Rainfed Field	28	29	29	29	29	29
2 Buildings (Nos)						
a. Housing Units	1,803	2,065	2,130	2,243	2,243	2,243
b. Shopping Stores	27	30	31	33	33	33
c. Factories	5	5	5	5	5	5
d. Pre-Schools	0	0	0	1	2	2
e. Elementary Schools	7	8	8	8	8	8
f. Secondary Schools	0	0	0	0	0	0
g. Tertiary Schools	0	0	0	0	0	0
h. Hospitals	0	0	0	0	0	0
i. Barangay Health Stations	0	0	0	0	0	0
j. Rural Health Units	3	4	4	4	4	4
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	86.3	124.7	136.4	148.9	160.0	169.0
a. Agricultural Production	25.3	34.0	36.5	39.2	40.5	43.2
- Irrigated Field	25.1	33.6	36.1	38.8	40.1	42.8
- Rainfed Field	0.2	0.3	0.3	0.4	0.4	0.4
b. Housing Units	34.1	52.8	58.9	64.1	70.9	74.8
c. Industry	3.3	4.4	4.7	5.0	5.1	5.2
- Shopping Stores	3.2	4.3	4.5	4.8	4.9	5.0
- Factories	0.1	0.2	0.2	0.2	0.2	0.2
d. Infrastructure	23.6	33.5	36.3	40.6	43.5	45.9
- Social Infrastructure	9.2	12.7	13.6	15.8	16.9	17.7
. Educational Facilities	6.7	8.8	9.7	10.9	11.5	12.4
. Medical Facilities	2.5	3.9	3.9	4.9	5.3	5.3
- Physical Infrastructure	14.4	20.8	22.7	24.8	26.7	28.2
2. Indirect Damage	8.6	12.5	13.6	14.9	16.0	16.9
3. Total	94.9	137.2	150.0	163.8	176.0	185.9
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	23.7	58.6	72.9	82.3	85.7	87.5

Table E.1.2(5) Damageable Property, Flood Damage and Flood Control Benefit in Solsona River Basin

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	4,721	5,358	5,358	7,152	7,152	7,811
2 Area Inundated (km^2)	19.0	21.5	22.3	22.8	23.0	25.5
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	1,297	1,448	1,465	1,515	1,515	1,712
b. Rainfed Field	36	36	36	36	36	36
2 Buildings (Nos)						
a. Housing Units	919	1,045	1,045	1,396	1,396	1,520
b. Shopping Stores	16	17	17	24	24	26
c. Factories	7	7	7	7	7	7
d. Pre-Schools	2	2	2	2	2	2
e. Elementary Schools	5	5	5	5	5	5
f. Secondary Schools	2	2	2	2	2	2
g. Tertiary Schools	0	0	0	0	0	0
h. Hospitals	0	0	0	0	0	0
i. Barangay Health Stations	1	1	1	1	1	1
j. Rural Health Units	1	1	1	1	1	1
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	60.7	75.3	80.6	93.5	101.9	115.4
a. Agricultural Production	15.0	19.0	20.6	22.2	23.9	25.9
- Irrigated Field	14.7	18.6	20.2	21.9	23.4	25.4
- Rainfed Field	0.3	0.4	0.4	0.4	0.4	0.5
b. Housing Units	23.3	29.8	30.9	39.3	43.3	51.3
c. Industry	2.3	2.7	2.9	3.6	3.8	4.5
- Shopping Stores	2.1	2.5	2.6	3.4	3.5	4.2
- Factories	0.2	0.2	0.2	0.2	0.3	0.3
d. Infrastructure	20.2	23.8	26.3	28.4	31.0	33.7
- Social Infrastructure	10.0	11.3	12.8	12.8	14.0	14.4
. Educational Facilities	9.1	10.4	11.3	11.3	11.9	12.4
. Medical Facilities	0.9	0.9	1.6	1.6	2.0	2.0
- Physical Infrastructure	10.1	12.5	13.4	15.6	17.0	19.2
2. Indirect Damage	6.1	7.5	8.1	9.4	10.2	11.5
3. Total	66.7	82.8	88.7	102.9	112.1	126.9
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	16.7	39.1	47.7	53.4	55.6	56.8

Table E.1.2(6) Damageable Property, Flood Damage and Flood Control Benefit in Madongan River Basin

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	8,131	8,605	8,745	8,764	8,918	9,358
2 Area Inundated (km^2)	37.0	39.3	41.3	41.8	42.8	43.8
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	2,009	2,189	2,291	2,307	2,362	2,476
b. Rainfed Field	5	5	5	5	15	15
2 Buildings (Nos)						
a. Housing Units	1,583	1,678	1,707	1,711	1,741	1,829
b. Shopping Stores	26	29	29	29	29	29
c. Factories	1	1	1	1	1	1
d. Pre-Schools	2	2	2	2	2	2
e. Elementary Schools	5	6	7	7	7	8
f. Secondary Schools	1	1	1	1	1	1
g. Tertiary Schools	0	0	0	0	0	0
h. Hospitals	0	0	0	0	0	0
i. Barangay Health Stations	0	0	0	0	0	0
j. Rural Health Units	2	2	2	2	2	2
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	61.6	85.2	94.2	107.0	117.1	130.2
a. Agricultural Production	18.3	22.7	24.7	26.8	29.1	30.4
- Irrigated Field	18.2	22.7	24.7	26.8	29.0	30.4
- Rainfed Field	0.0	0.0	0.0	0.0	0.0	0.0
b. Housing Units	22.3	34.8	38.2	45.8	50.9	59.5
c. Industry	2.5	3.3	3.5	3.7	3.8	3.9
- Shopping Stores	2.5	3.3	3.5	3.6	3.8	3.8
- Factories	0.0	0.0	0.0	0.0	0.0	0.0
d. Infrastructure	18.4	24.4	27.8	30.8	33.3	36.4
- Social Infrastructure	8.2	10.2	12.1	12.9	13.8	14.7
. Educational Facilities	6.7	8.6	10.1	11.0	11.4	12.3
. Medical Facilities	1.5	1.5	2.0	2.0	2.4	2.4
- Physical Infrastructure	10.3	14.2	15.7	17.8	19.5	21.7
2. Indirect Damage	6.2	8.5	9.4	10.7	11.7	13.0
3. Total	67.7	93.7	103.6	117.7	128.8	143.2
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	16.9	41.1	51.0	57.6	60.1	61.5

Table E.1.2(7) Damageable Property, Flood Damage and Flood Control Benefit in Papa River Basin

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Affected Population and Area						
1 Affected Population (Persons)	3,495	3,926	4,494	4,651	4,769	4,769
2 Area Inundated (km^2)	17.3	18.8	19.0	19.5	19.8	20.0
II. Inundated Property						
1 Agricultural Land (ha)						
a. Irrigated Field	1,190	1,270	1,304	1,351	1,391	1,414
b. Rainfed Field	28	32	32	32	32	32
2 Buildings (Nos)						
a. Housing Units	682	767	880	910	934	934
b. Shopping Stores	11	12	14	14	14	14
c. Factories	2	2	2	2	2	2
d. Pre-Schools	0	0	0	0	0	0
e. Elementary Schools	5	5	5	5	5	5
f. Secondary Schools	1	1	1	1	1	1
g. Tertiary Schools	0	0	0	0	0	0
h. Hospitals	0	0	0	0	0	0
i. Barangay Health Stations	0	0	0	0	0	0
j. Rural Health Units	0	0	0	0	0	1
III. Estimated Value of Damaged Property (Million Pesos in Financial Terms)						
1. Direct Damage	29.1	31.9	33.0	41.7	46.0	47.4
a. Agricultural Production	7.9	8.7	9.0	10.4	11.5	12.0
- Irrigated Field	7.7	8.3	8.7	10.1	11.1	11.7
- Rainfed Field	0.2	0.3	0.3	0.3	0.3	0.3
b. Housing Units	9.4	10.9	11.3	16.9	18.5	18.7
c. Industry	1.4	1.6	1.7	2.0	2.1	2.1
- Shopping Stores	1.4	1.5	1.6	2.0	2.1	2.1
- Factories	0.0	0.0	0.0	0.0	0.1	0.1
d. Infrastructure	10.3	10.8	11.0	12.4	13.9	14.6
- Social Infrastructure	5.5	5.5	5.5	5.5	6.2	6.7
. Educational Facilities	5.5	5.5	5.5	5.5	6.2	6.2
. Medical Facilities	0.0	0.0	0.0	0.0	0.0	0.5
- Physical Infrastructure	4.8	5.3	5.5	7.0	7.7	7.9
2. Indirect Damage	2.9	3.2	3.3	4.2	4.6	4.7
3. Total	32.0	35.1	36.3	45.9	50.6	52.2
IV. Annual Benefit under Present Conditions (Million Pesos in Financial Terms)						
Annual Benefit	8.0	18.1	21.6	24.1	25.1	25.6

Table E.1.3 Land Loss Prevention Benefit

Item	Unit	Papa River Basin	Madongan River Basin	Solsona River Basin	Cura River Basin	Total
1. Lost Areas						
Total Loss Areas	ha for 20 yeas	64.0	142.0	241.0	584.0	1,031.0
Average Lost Areas	ha/year	3.2	7.1	12.1	29.2	51.6
Cropping Pattern						
System (1)	ha	0.6	1.4	2.4	5.8	10.2
System (2)	ha	2.6	5.7	9.7	23.4	41.4
2. Lost Production Due to Land Losses						
System (1)*1	1000 Pesos/year	170.6	398.2	682.6	1,649.5	2,900.9
System (2)*2	1000 Pesos/year	73.1	160.2	271.2	657.5	1,161.9
Total		243.7	558.3	953.7	2,307.1	4,062.8
3. Flood Mitigation, Accounted in the lost areas						
Unit Benefit*3	1000 Pesos/year	3.92	5.69	7.49	7.17	-
Total Benefit	1000 Pesos/year	12.5	40.4	90.3	209.4	352.6
4. Benefit as Land Loss Prevention*3	1000 Pesos/year	231.2	517.9	863.5	2,097.7	3,710.3

Note: *1 Refer to Table C.5.8 in Part 1. Unit production rate was estimated at P284,400 per ha in financial term
*2 Refer to Table C.5.8 in Part 1. Unit production rate was estimated at P28,100 per ha in financial terms
*3 Annual unit benefit of flood mitigation in croplands is calculated using the figures of the respective schemes in Table E.1.2.
*4 Flood mitigation benefit is subtracted from the lost production values, because of double account.

Table E.1.4 Benefit Accruing from Agricultural Lands Restored

Item	Unit	Papa River Basin	Madongan River Basin	Solsona River Basin	Cura River Basin	Total
Recovered Areas						
Grazing Fields	ha	220.3	360.1	57.1	181.3	818.8
Upland Fields	ha	11.8	291.2	0.8	208.8	512.6
Lowland Fields	ha	0.0	227.8	62.9	210.8	501.5
Total	ha	232.1	879.1	120.8	600.9	1,832.9
Benefits						
Livestock Production	1000 Pesos/year	0.0	0.0	0.0	0.0	0.0
Upland Production*1	1000 Pesos/year	51.9	1,281.3	3.5	918.7	2,255.4
Lowland Production*2	1000 Pesos/year	0.0	2,824.7	780.0	2,613.9	6,218.6
Total	1000 Pesos/year	51.9	4,106.0	783.5	3,532.6	8,474.0

Note: *1 Refer to Table C.5.9 in Appendix C of Part 1. Unit production rate was estimated at P4,400 per ha in financial terms.
*2 Refer to Table C.5.7 in Part 1. Unit production rate was estimated at P12,400 per ha in financial terms.

Table E.2.1 Percentage of Taxation to Estimated Market Values of Local and Foreign Currency Portions

Item	Tax Rates of Construction Materials and Services on Estimated Market Values						
	National Taxation				Local Taxation		Imposed on Total Value of Local & Foreign Portions (g)
	Imposed on Both Local & Imported Goods			Imposed Only			
	Value Added Tax (a)	Excise Tax (b)	Income Tax (c)	Imported Goods Customs Duties (d)	Tax on Sand, Gravel & Quarry Resources (e)	Other Taxes*10 (f)	
1. Materials							
a. Cement	9.09% *1	1.82% *4	1.26% *8	1.12% *13	-	0.88%	14.2%
b. Aggregate (Coarse & Fine)	9.09% *1	1.82% *4	2.31% *8	1.16% *13	3.00% *5	1.77%	19.1%
c. Steel	9.09% *1	1.82% *6	1.27% *8	2.17% *13	-	0.89%	15.2%
d. Fuel & Lubricant	9.09% *1	4.81% *7	0.72% *8	12.98% *14	-	0.79%	28.4%
e. Lumber	9.09% *1	-	1.09% *8	0.77% *13	-	0.76%	11.7%
f. Others	9.09% *1	-	2.34% *8	1.16% *13	-	1.37%	14.0%
2. Machinery and Equipment Rental	- *16	-	1.30% *8	10.88% *15	-	0.83%	13.0%
3. Labor							
a. Skilled Workers	- *16	-	7.00% *9	-	-	-	7.0%
b. Unskilled Workers	- *16	-	-	-	-	-	0.0%
4. Indirect Costs							
a. OCM*3	9.09% *1	-	1.82%	-	-	2.73% *11	13.6%
b. Profit	-	-	35.00%	-	-	-	35.0%
c. VAT*2	100.0% *2	-	-	-	-	-	100.0%
5. Government Expenditure							
a. Engineering & Adm. Overhea	-	-	5.00% *11	-	-	-	5.0%
6. Engineering Service	9.09% *1	-	0.91% *12	-	-	-	10.0%

Source: The Fundamentals of Taxation, 1993 Edition, October 1996, REX Book Store
The National Internal Revenue Code of the Philippines Annotated, 1997 Revised Edition, National Book Store

Note:
*1 Value Added Tax: 10% of sales or appropriated amount
*2 The tax is imposed on (4) machinery and equipment rental and (5) labor costs, which are eliminated from market value completely.
*3 Overhead, contingencies and miscellaneous expenses
*4 The tax was assumed to account for 2% of purchased amount excluding VAT, according to page 1046 and 1049 of the reference T44.
*5 4 pesos per 1 cu.m. of aggregate consumed including local government charge, or 3.3% of purchased value excluding VAT
*6 The tax was assumed to account for 2% of purchased amount excluding VAT, according to page 1047 of the reference T44.
*7 8.5 pesos per 1 liter of diesel fuel oil consumed, and 0.45 pesos of excise tax per liter.
*8 Compensation of workers comes from II-2 of Table E.1.2 and profit (included in operating surplus) of manufacturer from II-3 of Table E.1.2.
Income tax on workers was assumed at 10% of the compensation and income tax on manufacturer at 35% of the profit which accounts for 1/10 of operating surplus.
*9 7% of a total wage including basic salary and fringe benefits was assumed as average annual income tax.
*10 Including (1) real property tax, (2) professional tax, (3) business taxes, (4) license fee, etc.
5% of operation surplus was assumed to be paid for other local taxes, which comes from Table II-3 of Table E.1.2.
*11 5% of overhead expenses, accounting for 60% of OCM, was assumed to be allocated as the taxes.
*12 10% of local personnel expenses, accounting for 10% of the total expenditure, was assumed to be paid for income tax.
*13 10% of imported CIF value, which comes from II-1 of Table E.1.2, was assumed to be imposed as customs duties and charges.
*13 19.2% (P1.63/liter (Customs Duty) to P8.50/liter of Diesel) of imported CIF value, which comes from II-1 of Table E.1.3, was assumed to be imposed as customs duties and charges.
*15 3% of imported CIF value of backhoe and truck-crane and 30% of dump-truck were assumed to be imposed as customs duties and charges.
*16 VAT is appropriated in the item 4-c as ultimate payment, so the VAT figure is not indicated here.

Table E.2.2 Cost Composition of Construction Materials: 1990

(Unit: Million Pesos)

Description	Commodity							
	16 Stone Quarrying & Sand Pits	23 Wood & Wood Products	30 Products of Petroleum & Coal	31 Non-metallic Mineral Products	33 Metal Fabrication	34 Machinery Except Electrical	36 Transport Equipment	TID Total Intermediate Demand
	Aggregate	Lumber	Fuel/Lubricant	Cement	Steel Bar	Machinery & Equipment		Others
I. Composition of Material Cost								
1. Domestic Intermediate Input	742	11,924	1,744	12,346	8,976	1,137	4,232	754,123
2. Imports	398	1,521	44,728	2,713	4,483	1,545	3,986	256,088
3. Compensation of employees	369	1,104	1,099	1,550	1,323	400	655	304,198
4. Depreciation	401	418	2,023	1,060	334	130	349	82,456
5. Indirect Taxes Less Subsidie	42	472	8,680	505	345	67	239	42,400
6. Operating Surplus	1,220	2,985	10,490	4,257	3,706	797	1,843	602,698
7. Gross Value Added*1	2,032	4,979	22,290	7,373	5,709	1,394	3,086	1,031,751
8. Total Primary Inputs*2	2,430	6,500	67,018	10,086	10,191	2,939	7,072	1,287,839
9. Total Inputs*3	3,172	18,424	68,762	22,432	19,168	4,075	11,304	2,041,962
10. Total Inputs w/o ITS*4	3,130	17,952	60,083	21,927	18,822	4,008	11,065	1,999,562
II. Share of Component								
1. Imports to Total Inputs w/o ITS	12.7%	8.5%	74.4%	12.4%	23.8%	38.5%	36.0%	12.8%
2. Compensation to Total Inputs w/o ITS	11.8%	6.2%	1.8%	7.1%	7.0%	10.0%	5.9%	15.2%
3. Operating Surplus to Total Inputs w/o ITS	39.0%	16.6%	17.5%	19.4%	19.7%	19.9%	16.7%	30.1%
cf. Indirect Taxes Less Subsidie to Total Inputs	1.3%	2.6%	12.6%	2.3%	1.8%	1.6%	2.1%	2.1%

Source: 1990 Input-Output Table at Current Producers' Prices [59 x 59 Commodity x Commodity Use Matrix (Domestic/Non-competitive)], NSCB

Note: *1 (3)+(4)+(5)+(6)
*2 (2)+(7)
*3 (1)+(8)
*4 Total Inputs without Indirect Taxes Less Subsidies: (9)-(5)

Table E.2.3 Conversion Factors from Financial Market Cost to Real Economic Cost

Item	Local/Foreign Currency Composition Appropriated for Project Cost Estimation*1		Tax Portion Against Total Market Cost*2	Shadow Wage Rate *3	Foreign Portion		Conversion Factors for Estimated Financial Costs of Local/Foreign Portions		Conversion Factors for Benefit Estimation
	Local	Foreign			Import Share to Total*4	Shadow Exchange Rate*3	Local	Foreign	
1. Materials									
a. Cement	30%	70%	14%	100%	12%	120%	0.53	1.04	0.88
b. Aggregate (Coarse & Fine)	60%	40%	19%	100%	13%	120%	0.68	1.06	0.83
c. Steel	20%	80%	15%	100%	24%	120%	0.24	1.06	0.90
d. Fuel & Lubricant	30%	70%	28%	100%	74%	120%	0.05	1.21	0.86
e. Lumber	60%	40%	12%	100%	8%	120%	0.80	1.04	0.90
f. Others	50%	50%	14%	100%	13%	120%	0.72	1.05	0.89
2. Machinery and Equipment Rental	30%	70%	13%	100%	37%	120%	0.57	1.11	0.94
3. Labor									
a. Skilled Workers	100%	0%	7%	100%	-	-	0.93	-	0.93
b. Unskilled Workers	100%	0%	0%	60%	-	-	0.60	-	0.60
4. Indirect Costs									
a. OMC*3	100%	0%	14%	100%	-	-	0.86	-	0.86
b. Profit	100%	0%	35%	100%	-	-	0.65	-	0.65
c. VAT*2	100%	0%	100%	100%	-	-	0.00	-	0.00
5. Government Expenditure									
a. Engineering & Administrative Overhead	100%	0%	5%	100%	-	-	0.95	-	0.95
6. Engineering Service	10%	90%	10%	100%	100%*5	120%	0.00	1.22	1.10

Source: ICC Project Evaluation Procedures and Guidelines, NEDA

Note: *1 Composition figures come from NEDA information.
*2 Refer to Column (g) of Table E.1.1.
*3 Refer to the above source.
*4 The total figures do not include indirect taxes. Imported portion comes from II-1 of Table E.1.2.
*5 Engineering service is supplied by a foreign consultant firm.

Table E.2.4(1) Financial and Economic Costs of Three-Bedroom House

	Item	Construction Cost Total	Conversion Rate	Total Construction Costs in Real Economic Value
1.	Materials			
	a. Cement	25,053	0.88	22,121
	b. Aggregate (Coarse & Fine)	2,112	0.83	1,761
	c. Steel	51,262	0.90	45,894
	d. Fuel & Lubricant	0	0.86	0
	e. Lumber	12,000	0.90	10,799
	f. Others	90,350	0.89	80,045
2.	Labor			
	a. Skilled Workers	23,200	0.93	21,576
	b. Unskilled Workers	22,000	0.60	13,200
3.	Indirect Taxes			
	a. OCM	15,818	0.86	13,604
	b. Profit	22,685	0.65	14,745
	c. VAT	4,520	0.00	0
5.	Total	269,000	-	223,745
6.	Conversion Factor		0.83	

Source: City Engineer's Office, Ilocos Norte, "the Construction of Three-Bedroom House in Barangay #5, Sarrat", 1998

Note: *1 Overhead, contingency and miscellaneous

*2 Assumed as follows:

(1) 35% of contractor's income as corporation income tax

(2) 10% of personal income of engineers and managers, which was assumed as one-third of overhead expenses. The overhead was assumed as one-third of OCM.

*3 The taxes were assumed at 2% of overhead expense, which consist of Real property tax, registration Fee and license tax.

Table E.2.4(2) Financial and Economic Costs of Public Market

	Item	Construction Cost Total	Conversion Rate	Total Construction Costs in Real Economic Value
1.	Materials			
	a. Cement	250,800	0.88	221,451
	b. Aggregate (Coarse & Fine)	95,400	0.83	79,559
	c. Steel	1,171,122	0.90	1,048,489
	d. Fuel & Lubricant	3,300	0.86	2,854
	e. Lumber	146,660	0.90	131,979
	f. Others	167,157	0.89	148,091
2.	Equipment Rental	53,840	0.94	50,610
3.	Labor			
	a. Skilled Workers	241,276	0.93	224,387
	b. Unskilled Workers	220,218	0.60	132,131
4.	Indirect Taxes			
	a. OMC	234,977	0.86	202,080
	b. Profit	234,977	0.65	152,735
	c. VAT	51,533	0.00	0
5.	Government Expenditure			
	a. Engineering & Admi. Overhead	128,740	0.95	122,303
6.	Total	3,000,000	-	2,516,669
7.	Conversion Factor		0.84	

Source: Office of the District Engineer, Ilocos Norte Sub-District Engineer's Office
"The Construction of Solsona Public Market, Phase II, Solsona, Ilocos Norte", 1996

Note: *1 Overhead, contingency and miscellaneous
*2 Assumed as follows:
(1) 35% of contractor's income as corporation income tax
(2) 10% of personal income of engineers and managers, which was assumed one-third of ov
*3 The taxes were assumed at 2% of overhead expense, which consist of Real property tax, registr

Table E.2.4(3) Financial and Economic Costs of Factory

	Item	Construction Cost Total	Conversion Rate	Total Construction Costs in Real Economic Value
1.	Materials			
	a. Cement	55,680	0.88	49,164
	b. Aggregate (Coarse & Fine)	9,720	0.83	8,106
	c. Steel	178,920	0.90	160,185
	d. Fuel & Lubricant	-	0.86	0
	e. Lumber	50,400	0.90	45,355
	f. Others	111,850	0.89	99,093
2.	Labor			
	a. Skilled Workers	59,350	0.93	55,196
	b. Unskilled Workers	59,350	0.60	35,610
3.	Indirect Taxes			
	a. OMC	52,527	0.86	45,173
	b. Profit	75,333	0.65	48,966
	c. VAT	11,870	0.00	0
5.	Engineering Supervision	15,000	0.86	12,955
5.	Total	680,000	-	559,802
6.	Conversion Factor		0.82	

Source: Bacarra Municipal Office, "Bacarra Factory Warehouse", 1994

Note: *1 Overhead, contingency and miscellaneous

*2 Assumed as follows:

(1) 35% of contractor's income as corporation income tax.

(2) 10% of personal income of engineers and managers, which was assumed one-third of ov

*3 The taxes were assumed at 2% of overhead expense, which consist of Real property tax, registr

*4 Supervised by a local consultant

Table E.2.4(4) Financial and Economic Costs of Elementary School

	Item	Total Construction Costs in Financial Market Value	Conversion Rate	Total Construction Costs in Real Economic Value
1.	Materials			
	a. Cement	62,240	0.88	54,957
	b. Aggregate (Coarse & Fine)	9,800	0.83	8,173
	c. Steel	122,698	0.90	109,850
	d. Fuel & Lubricant	0	0.86	0
	e. Lumber	91,572	0.90	82,406
	f. Others	30,852	0.89	27,333
	g. Testing of Materials	4,115	0.89	3,646
2.	Labor			
	a. Skilled Workers	45,539	0.93	42,351
	b. Unskilled Workers	48,800	0.60	29,280
3.	Indirect Taxes			
	a. OMC	29,093	0.86	25,020
	b. Profit	37,107	0.65	24,119
	c. VAT	9,434	0.00	0
4.	Government Expenditure			
	a. Engineering & Admi. Overhead	8,750	0.95	8,313
5.	Total	500,000	-	415,447
6.	Comprehensive Conversion Factor		0.83	

Source: Ilocos Norte Engineering Office, Laoag City, "Construction of 2-Classrooms Bangui Central Elementary School, Bangui, Ilocos Norte, 1996 with Toilet 2 Seater (2.0m x 3.0m)"

Note: *1 Overhead, contingency and miscellaneous

*2 Assumed as follows:

(1) 35% of contractor's income as corporation income tax

(2) 10% of personal income of engineers and managers, which was assumed one-third of overhead expenses. The overhead was assumed as one-third of OCM.

*3 The taxes were assumed at 2% of overhead expense, which consist of Real property tax, registration Fee and license tax.

Table E.2.4(5) Financial and Economic Costs of Barangay Health Station

	Item	Construction Cost Total	Conversion Rate	Total Construction Costs in Real Economic Value
1.	Materials			
	a. Cement	16,170	0.88	14,278
	b. Aggregate (Coarse & Fine)	3,350	0.83	2,794
	c. Steel	25,843	0.90	23,137
	d. Fuel & Lubricant	0	0.86	0
	e. Lumber	58,960	0.90	53,058
	f. Others	27,744	0.89	24,579
2.	Labor			
	a. Skilled Workers	36,881	0.93	34,299
	b. Unskilled Workers	16,726	0.60	10,035
3.	Indirect Taxes			
	a. OCM	12,997	0.86	11,178
	b. Profit	19,037	0.65	12,374
	c. VAT	5,361	0.00	0
4.	Government Expenditure			
	a. Engineering & Admi. Overhead	6,931	0.95	6,585
5.	Total	230,000	-	192,317
6.	Conversion Factor		0.84	

Source : Office of the City Engineer, Laoag City, "The Construction of Health Center at Barangay #31 Talingaan, Ilocos Norte", 1996

Note: *1 Overhead, contingency and miscellaneous

*2 Assumed as follows:

(1) 35% of contractor's income as corporation income tax

(2) 10% of personal income of engineers and managers, which was assumed one-third of ov

*3 The taxes were assumed at 2% of overhead expense, which consist of Real property tax, registr

Table E.2.5 (1.1) Estimated Costs of Three-Bedroom House

Item	Cost	% Distribution
I Estimated Cost		
A. Direct Cost:		
1. Mobilization/Demobilization		
2. Materials	180,777	67%
2.1 Supply/Delivery		
2.2 Testing of Materials		
3. Labor (including fringe benefit)	45,200	17%
4. Equipment Expenses		
Sub-total	225,977	84%
B. Indirect Cost		
1. Overhead, Contingencies, Miscellaneous (7% to 12% of A1 to A4)	15,818	6%
2. Profit (5% to 12% of A1 to A4)	22,685	8%
3. Comprehensive All Risk Insurance (1.5% of A1 to A4)		
4. VAT (10% of A1 to A4)	4,520	2%
Sub-Total	43,023	16%
Total (Contract Cost)	269,000	100%
II Estimated Government Expenditures		
1. Engineering & Administrative Overhead (3% 0f A1 to A4)		
2. ROW/Acquisition /Prelim-Engineering		
3. Materials to be furnish by the Government		
Sub-Total		
III Contingencies/Reserves		
1. Physical (Up to 5% of the Estimated Contract Cost)		
2. Price Escalation (Up to 12% of the Estimated Contract Cost)		
Total Estimated Contract Cost	269,000	100%

Source: City Engineer's Office, Ilocos Norte, "the Construction of Three-Bedroom House in Barangay #5, Sarrat", 1998

Table E.2.5 (1-2) Estimated Costs of Three-Bedroom House

		Item	Quantity	Unit	Unit Cost	Total
I		**Concrete Works**				
	A	Materials				
		Portland Cement	112	bags	113.00	12,656.00
		Gravel	5	cu.m.	100.00	480.00
		Sand	10	cu.m.	120.00	1,152.00
						14,288.00
	B	Labor				3,600.00
		Sub-total				17,888.00
II		**Masonry Works**				
	A	Materials				
		5" CHB	1,260	pcs	3.50	4,410.00
		4" CHB	400	pcs	3.00	1,200.00
		Portland Cement	60	bags	113.12	6,787.20
		Sand	4	cu.m.	120.00	480.00
						12,877.20
	B	Labor				3,200.00
		Sub-total				16,077.20
III		**Steel Works**				
	A	Materials				
		16"mm Deformed Bars	47	pcs	115.00	5,405.00
		12"mm Deformed Bars	59	pcs	64.00	3,776.00
		10"mm Deformed Bars	153	pcs	44.00	6,732.00
		9"mm Deformed Bars	49	pcs	34.00	1,666.00
		GA #16 G.I Wire	1	roll	1,000.00	1,000.00
						18,579.00
	B	Labor				4,600.00
		Sub-total				23,179.00
IV		**Steel Truss:**				
	A	Materials				
		3/16"x2"x2" Angle Bar	30	pcs	240.00	7,200.00
		2"x 4" C-Purlins	25	pcs	260.00	6,500.00
		Welding Rod	1	box	750.00	750.00
						14,450.00
	B	Labor				3,600.00
		Sub-total				18,050.00
V		**Carpentry Works:**				
	A	Materials				
		Tanguile 2"x2"x14"	260	bd.ft.	24.00	6,240.00
		Asstd. Nails	1	kg.	1,000.00	1,000.00
		Ordinary Plywood 1/4	15	pcs	220.00	3,300.00
		Marine Plywood 1/4	6	pcs	240.00	1,440.00
		Tanguile 1"x10"x 12"	30	db.ft	34.00	1,020.00
						13,000.00
	B	Labor				3,300.00
		Sub-total				16,300.00

(To be continued)

Table E.2.5 (1-3) Estimated Costs of Three-Bedroom House

(Conclusion)

	Item	Quantity	Unit	Unit Cost	Total
VI	**Tinsmith Works:**				
A	Materials				
	GA #26 Corr. GI shts.	612	pcs	19.00	11,628.00
	" End Wall Gutter	3	pcs	120.00	360.00
	" Spanish Gutter	12	pcs	120.00	1,440.00
	" Valley Gutter	8	pcs	120.00	960.00
	" Ridge Roll	8	pcs	120.00	960.00
	Tech Screw	1,310	pcs	1.25	1,634.88
	Blind Rivets(Asstd.)	500	pcs	0.50	250.00
	Vulca Seal	2	qts.	75.00	150.00
					17,382.88
B	Labor				4,300.00
	Sub-total				21,682.88
VII	**Specialty Works:**				
A	Materials				
	Steel Windows	12	sq.m	600.00	7,200.00
	Narra Panel Door	3	set	3,500.00	10,500.00
	Flush Door	4	set	500.00	2,000.00
	Tile Works	36	sq.m.	350.00	12,600.00
	Wood Parques	54	sq.m	350.00	18,900.00
	Painting Works			lump sum	20,000.00
					71,200.00
B	Labor				17,800.00
	Sub-total				89,000.00
VIII	**Electrical Works:**				
A	Material				
	Rought-ins			lump sum	4,000.00
	Fixtures			lump sum	6,000.00
					10,000.00
B	Labor				2,500.00
	Sub-total				12,500.00
IX	**Plumbing Works:**				
A	Material				
	Rough-ins			lump sum	2,000.00
	Fixtures			lump sum	7,000.00
					9,000.00
B	Labor				2,300.00
	Sub-total				11,300.00
	Total				225,977.08
	Material				180,777.08
	Labor				45,200.00

Table E.2.5 (2-1) Estimated Costs of a Public Market

Item	Cost	% Distribution
I. Estimated Cost		
A. Direct Cost:		
1. Mobilization/Demobilization		
2. Materials	1,834,439	61%
2.1 Supply/Delivery		
2.2 Testing of Materials		
3. Labor (including fringe benefits)	461,494	15%
4. Equipment Expenses	53,840	2%
Sub-total	2,349,773	78%
B. Indirect Cost:		
1. Overhead, Contingency, Miscellaneous (7% to 12% of A1 to A4)	234,977	8%
2. Profit (5% to 12% of A to A4)	234,977	8%
3. Comprehensive All Risk Insurance (1.5% of A1 to A4)		
4. VAT (10% of A3 to A4)	51,533	2%
Sub-Total	521,487	17%
Total (Contract Cost)	2,871,260	96%
II. Estimated Government Expenditure		
1. Engineering & Administrative Overhead (3% of A1 to A4)	128,740	4%
2. ROW/Site Acquisition/Prelim-Engineering.		
3. Materials to be furnish by the Government.		
Sub-Total	128,740	4%
III. Contingencies/Reserves		
1. Physical (Up to 5% of the Estimated Contract Cost)		
2. Price Escalation(up to 12% of the Estimated Cost)		
Total Estimated Contract Cost	3,000,000	100%

Source: Office of the District Engineer, Ilocos Norte Sub-District Engineer's Office
"The Construction of Solsona Public Market, Phase II, Solsona, Ilocos Norte", 1996

Table E.2.5 (2-2) Estimated Costs of Public Market

Item	Quantity	Unit	Unit Cost	Total
I. Siteworks:				
A Materials				
488 cu.m. Filling Materials			100.00	48,800.00
B Labor				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Laborers	5	persons	863.60	
	5	days	1,404.07	7,020.35
C Equipment Rentals				
Unit Backhoe	@ 4,500/d for 3 days			13,500.00
Sub-Total				69,320.35
II Concrete Works:				
A Materials				
Portland Cement	1,653	bgs	120.00	198,360.00
Coarse Agg.	184	cu.m.	150.00	27,600.00
Fine Agg.	92	cu.m.	120.00	11,040.00
#16mmx6m.	231	pcs	205.00	47,355.00
#16mm x 7.5m.	245	pcs	170.00	41,650.00
#16mm x 6.0m	515	pcs	140.00	72,100.00
#12mm x 6.0m	308	kls.	75.00	23,100.00
# 10mm x 9.0m	93	pcs	80.00	7,440.00
# 10mm x 6.0m.	1,950	pcs	55.00	107,250.00
Form lumber	5,000	bd.ft	26.00	130,000.00
6mm tck lumber	88	pcs	320.00	28,160.00
GI Tie Wire	10	Rolls	1,400.00	14,000.00
CWN Asst.	7	kgs	1,200.00	8,400.00
				716,455.00
B Labor				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Steelman	2	persons	359.62	
Mason/carpenter	8	persons	1,438.48	
Laborers	12	persons	2,072.64	
	45	days	4,411.21	198,504.45
C Equipment Rentals				
Unit Concrete Mixer	1	unit/day	250.00	
Unit Concrete Vibrator	1	unit/day	90.00	
Unit Water Pump	1	unit/day	100.00	
	45	days	440.00	19,800.00
Sub-Total				934,759.45
III Masonry Works:				
Quantity = 339 sq.m.				
A Materials				
CHB 125mm	4407	pcs	4.50	19,831.50
Portland Cement	340	bags	120.00	40,800.00
Mixed Gravel & Sand	18	cu.m.	110.00	1,980.00
Fine Sand	43	cu.m.	120.00	5,160.00
#12mm x 6m	101	pcs	75.00	7,575.00
#10mm x 6m	101	pcs	53.00	5,353.00
#16 GI Tie Wire	22	kls	35.00	770.00
Sub-Total				81,469.50

(To be continued)

Table E.2.5 (2-3) Estimated Costs of Public Market

(Continuation)

Item	Quantity	Unit	Unit Cost	Total
B Labor				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Masons/carpenters	4	persons	719.24	
Laborers	8	persons	1,381.76	
	9	days	2,641.47	23,773.23
Sub-Total				105,242.73
IV Steel Works: (Roof Framing)				
A Materials				
Anle Bar 6mmx65mmx65mmx6	290	pcs	775.00	224,750.00
Angle Bar 6mmx50mmx50mmx6m	290	pcs	365.00	105,850.00
Welding rods	13	bxs	980.00	12,740.00
Gusset Plates	8	shts	6,550.00	52,400.00
Turn Buckle	29	pcs	125.00	3,625.00
#16mm Tie rod	67	pcs	135.00	9,045.00
Purlins 100mm	255	pcs	635.00	161,925.00
Teck screw 25.4mm	8800	pcs	3.00	26,400.00
Anchor Cleats 6mmx75mm	86	pcs	60.00	5,160.00
Angle Cleats 6mmx75mm	650	pcs	5.00	3,250.00
Zinc Oxide Primer	6	pails	1,100.00	6,600.00
Paint Thinner	12	gls	95.00	1,140.00
Oxygen/Acetylene	3	sets	1,200.00	3,600.00
				616,485.00
B Materials				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Masons/carpenters	4	persons	719.24	
Laborers	8	persons	1,381.76	
	56	days	2,641.47	147,922.32
C Equipment Rentals				
2 Units Welding Machine P400.00/d for 42 days				16,800.00
Electric Bill:				6,300.00
Sub-Total				787,507.32
V Tinsmithry Worsk:				
A Materials				
Corr. GI Sheets .5mmx84m	19	pcs	928.00	17,632.00
Corr. GI shts.5mmx7.92	112	pcs	832.00	93,184.00
Corr. GI Shts 50mmx7.3mm	130	pcs	768.00	99,840.00
Ridge Roll	40	pcs	185.00	7,400.00
Valley Gutter	12	pcs	185.00	2,220.00
Vulca Seal	3	gls	800.00	2,400.00
				222,676.00
B Labor				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Carpenters	4	persons	719.24	
Laborers	6	persons	1,036.32	
	22	days	2,296.03	50,512.66
C Equipment Rentals				
Reveters @ P 60/d	2	units	120.00	2,640.00
ElectricDrill @ P 100/d	2	months	200.00	44.00
		for 22 days	320.00	7,040.00
				1,500.00
Sub-Total				281,728.66

(To be continued)

Table E.2.5 (2-4) Estimated Costs of Public Market

(Continuation)

Item	Quantity	Unit	Unit Cost	Total
VI Comfort Rooms:				
(1) *Masonry Works*				
A Materials:				
CHB 125mm	600	pcs.	4.50	2,700.00
CHB 250mm	250	pcs.	3.50	875.00
Portland Cement	87	bags	120.00	10,440.00
#12mm x 6m	20	pcs.	75.00	1,500.00
#10mm x 6m	35	pcs.	55.00	1,925.00
Mixed Gravel/Sand	10	cu.m.	100.00	1,000.00
#16 GI Tie Wire	5	kls.	35.00	175.00
				18,615.00
B Labor:				
Civil Engineer	1	person	295.82	
Const. Foreman	1	person	245.65	
Masons	2	persons	359.62	
Laborers	4	persons	690.88	
	4	days	1591.97	6,367.88
Sub-Total				24,982.88
(2) *Tile Wainscotting:*				
A Materials:				
Mariwasa tiles	2140	pcs	16.50	35,310.00
Portland cement	10	bags	120.00	1,200.00
Tile Grout	20	kls	18.00	360.00
				36,870.00
B Labor:				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Masons	2	persons	359.62	
Laborers	4	persons	690.88	
	6	days	1,590.97	9,545.82
Sub-Total				71,394.20
(3) *Plumbing Fixtures*				
A Materials				
Water Closet	5	sets	4,000.00	20,000.00
Lavatory	4	sets	1,875.00	7,500.00
Urinal	2	sets	2,800.00	5,600.00
Floor Drain	6	pcs	75.00	450.00
				33,550.00
B Labor				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Plumber	1	persons	179.81	
Laborer	2	persons	345.44	
	7	days	1,065.72	7,460.04
Sub-Total				41,010.04
(4) *Carpentry Works*				
A Fabricated Materials:				
Louvers	5	sets	1,000.00	5,000.00
Flush Doors	2	sets	1,600.00	3,200.00
Door Jamb	2	sets	900.00	1,800.00
Steel Windows	3	sets	1,200.00	3,600.00
Door Lockset, Puller, Hinges		lump sum	3,000.00	3,000.00
				16,600.00

(To be continued)

Table E.2.5 (2-5) Estimated Costs of Public Market

(Conclusion)

Item	Quantity	Unit	Unit Cost	Total
(5) *Ceiling*				
A Materials:				
Marine Plywood	9	pcs	350.00	3,150.00
Ceiling Joints	135	bd.ft.	26.00	3,510.00
CWN Asstd.	15	kls	30.00	450.00
				7,110.00
B Labor				
Civil Engineer	1	person	294.82	
Const. Foreman	1	person	245.65	
Carpenters	2	persons	359.62	
Laborers	2	persons	345.44	
	2	days	1,245.53	2,491.06
Sub-Total				26,201.06
(6) *Rough in Materials:*				
A Materials:				
Soil and Water Pipes		lump sum		14,000.00
B Labor:		lump sum		4,200.00
Sub-Total				18,200.00
(7) *Painting:*				
A Materials		lump sum		6,000.00
B Labor		lump sum		2,000.00
Sub-Total				8,000.00
(8) *Electrical Works:*				
A Materials		lump sum		4,800.00
B Labor		lump sum		1,700.00
Sub-Total				6,500.00

Table E.2.5(3-1) Estimated Costs of Factory Warehouse

	Item	Cost	% Distribution
I.	Estimated Cost		
	A. Direct Cost:		
	1. Mobilization/Demobilization		
	2. Materials	406,570	60%
	2.1 Supply/Delivery		
	2.2 Testing of Materials		
	3. Labor(including fringe benefits)	118,700	17%
	4. Equipment Expenses		
	Sub-Total	525,270	
	B. Indirect Cost:		
	1. Overhead, Contingency, Miscellaneous (7% to 12% of A1 to A4)	52,527	8%
	2. Profit (5% to 12% of A to A4)	75,333	11%
	3. Comprehensive All Risk Insurance (1.5% of A1 to A4)		
	4. VAT (10% of A3 to A4)	11,870	2%
	Sub-Total	139,730	21%
	Total (Contract Cost)	665,000	
II.	Estimated Government Expenditure		
	1. Engineering & Administrative Overhead (3% of A1 to A4)		
	2. ROW/Site Acquisition/Prelim-Engineering		
	3. Materials to be furnish by the Government.		
	Sub-Total		
III.	Engineering Supervision	15,000	2%
	Total Estimated Contract Cost	680,000	100%

Source : Bacarra Municipal Office, "Bacarra Factory Warehouse", 1994

Table E.2.5(3-2) Estimated Costs of Factory Warehouse

Item	Quantity	Unit	Unit Cost	Total
I. Clearing and Foundation Excavation				20,000.00
II. Concrete Works				
A Material				
Cement	288	bags	120.00	34,560.00
Sand	17	cu.m.	120.00	2,040.00
Gravel	32	cu.m.	150.00	4,800.00
Deformed bars 10 mm.	460	pcs	55.00	25,300.00
Deformed bars 12 mm.	100	pcs	75.00	7,500.00
Deformed bars 16 mm.	120	pcs	140.00	16,800.00
Tie wire #16	1	roll	350.00	350.00
				91,350.00
B Labor Cost:				32,000.00
Sub-Total				123,350.00
III Masonry Works				
A Material				
100 mm. thk. CHB	550	pcs	5.00	2,750.00
150 mm. thk. CHB	2,650	pcs	6.00	15,900.00
Cement	192	bags	110.00	21,120.00
Sand	24	cu.m.	120.00	2,880.00
10 mm. deformed bars	140	pcs	55.00	7,700.00
Tie wire #16	1	roll	320.00	160.00
				50,510.00
B Labor Cost:				20,000.00
Sub-Total				70,510.00
IV Form Works				
A Material				
4' x 8' x 6mm. thk plywood	40	pcs	200.00	8,000.00
2' x 2' x 12" lumber	200	pcs	112.00	22,400.00
Assorted nails	2	boxes	350.00	700.00
				31,100.00
B Labor Cost:				10,000.00
Sub-Total				41,100.00
V Carpentry Works				
Ceiling works (L.S.)				20,000.00
B Labor Cost:				6,000.00
Sub-Total				26,000.00
VI Structural Steel Roof Frame				
A Material				
Purlins 4" x GA 16	52	pcs	320.00	16,640.00
Angle bars 50 x 50 x 4.5 mm. 6m.	27	pcs	385.00	10,395.00
Angle bars 50' x 50' x 6mm. 6m.	24	pcs	450.00	10,800.00
Angle bars 25' x 25' x 3 mm. 6m.	22	pcs	150.00	3,300.00
Anchor bolts 12mm. x 200m.	24	pcs	60.00	1,440.00
Base plates 200 x 150 x 6mm. thk.	12	pcs	250.00	3,000.00
Welding rods	2	boxes	380.00	760.00
Red Oxide Primer	10	gal.	300.00	3,000.00
Plain round bar 16mm. cross bracing	12	pcs	135.00	1,620.00
Standard turn buckle 16mm.	12	pcs	150.00	1,800.00
				52,755.00

(To be continued)

Table E.2.5(3-3) Estimated Costs of Factory Warehouse

(Conclusion)

Item	Quantity	Unit	Unit Cost	Total
B Labor Cost:				20,000.00
Sub-Total				72,755.00
VII Tinsmithry Works				
A Material				
Corr. GI sheet GA 26 x 4.5 ml.	68	pcs	400.00	27,200.00
Corr. GI sheet GA 26 x 1.3 ml.	14	pcs	100.00	1,400.00
Corr. GI sheet GA 26 x 0.7 ml.	50	pcs	750.00	37,500.00
Plain GI ridge roll 0.3 x 8'	9	pcs	155.00	1,395.00
Plain GI flashing 0.4 x 8'	14	pcs	160.00	2,240.00
Plain GI canopy flasing 0.3 x 8'	4	pcs	155.00	620.00
Riveter	500	pcs	0.60	300.00
Vulca Seal	1	gal.	800.00	800.00
				71,455.00
B Labor Cost:				15,000.00
Sub-Total				86,455.00
VIII Plumbing Works				
A Material				25,000.00
B Labor Cost:				7,500.00
Sub-Total				32,500.00
IX Electrical Works				
A Material				15,000.00
B Labor Cost:				4,000.00
Sub-Total				19,000.00
X Doors and Windows				
A Material				14,000.00
B Labor Cost:				4,200.00
Sub-Total				18,200.00

Table E.2.5(4-1) Estimated Costs of Two Classrooms, Elementary School

Item	Cost	% Distribution
I. Estimated Cost		
A. Direct Cost:		
1. Mobilization/Demobilization		
2. Materials	321,277	64%
2.1 Supply/Delivery		
2.2 Testing of Materials		
3. Labor(including fringe benefits)	94,339	19%
4. Equipment Expenses		
Sub-total	415,616	83%
B. Indirect Cost:		
1. Overhead, Contingency, Miscellaneous (7% to 12% of A1 to A4)	29,093	6%
2. Profit (5% to 12% of A to A4)	37,107	7%
3. Comprehensive All Risk Insurance (1.5% of A1 to A4)		
4. VAT (10% of A3 to A4)	9,434	2%
Sub-total	75,634	15%
Total (Contract Cost)	491,250	98%
II. Estimated Government Expenditure		
1. Engineering & Administrative Overhead (3% of A1 to A4)	8,750	2%
2. ROW/Site Acquisition/Prelim-Engineering		
3. Materials to be furnish by the Government.		
Sub-total		
III. Contingencies/Reserves		
1. Physical (Up to 5% of the Estimated Contract Cost)		
2. Price Escalation(up to 12% of the Estimated Cost)		
Total Estimated Contract Cost	500,000	100%

Source : Ilocos Norte Engineering Office, Laoag City, "Construction of 2-Classrooms Bangui Central Elementary School, Bangui, Ilocos Norte, with Toilet 2 Seater (2.0m x 3.0m)"

Table E.2.5(4-2) Estimated Costs of Two Classrooms, Elementary School

	Item	Quantity	Unit	Unit Cost	Total
I	**Siteworks**				
	Excavation : V = 17				
	Backfill : V = 26 cu.m. including Corridor				
	Elevate @ .20m from NGL				
A	Materials:				
	Mixed Sand and Gravel	29	cu.m.	110.00	3,190.00
B	Labor:(include staking, excavation, backfilling and compaction & demolition) of Floor Slab Walls & Columns				
	Carpenter	1	person	239.68	
	Laborers	10	persons	2,000.00	
		10	days	2,239.68	22,396.80
	Sub-Total				25,586.80
II	**Steelworks**				
A	Materials				
	16mm x 6.0m rsb Footing	28	RSB	265.27	
	16mm x 9.0m rsb C1	20	RSB	284.22	
	16mm x 7.5m rsb C2	8	RSB	94.74	
	10mm x 6.0m rsb Ties 1	43	RSB	158.93	
	10mm x 6.0m rsb Ties 2	13	RSB	48.05	
	10mm x 6.0m rsb WF1	6	RSB	22.18	
	10mm x 7.5m rsb WF2	6	RSB	27.72	
	10mm x 6.0m rsb Ties	3	RSB	11.09	
	10mm x 6.0m rsb WF Corr.	4	RSB	14.78	
	16mm x 9.0m rsb RB 1	16	RSB	227.38	
	16mm x 9.0m rsb RB 2	8	RSB	113.69	
	16mm x 9.0m rsb RB 1	5	RSB	71.06	
	10mm x 6.0m rsb Ties 1	35	RSB	129.36	
	10mm x 6.0m rsb Ties 2	16	RSB	59.14	
	10mm x 6.0m rsb Ties 3	8	RSB	29.57	
	10mm x 7.5m rsb Slab	26	RSB	166.32	
	10mm x 6.0m rsb	48	RSB	177.41	
	10mm x 6.0m rsb CHB	96	RSB	354.82	
				2,255.73	
		2,256	kgs.	18.00	40,608.00
	Ga. #16 G.I. Tie Wire	40	kgs.	33.00	1,320.00
	High Speed Hacksaw Blade	6	pcs.	35.00	210.00
					42,138.00
B	Labor				
	Steelman	2	persons	479.36	
	Laborers	4	persons	800.00	
		5	days	1,279.36	6,396.80
	Sub-Total				48,534.80
III	**Concrete Works:**				
	(0.85) (0.85) (0.25) Footing		cu.m.	2.17	
	(0.20) (0.35) (3.85) Column 1		cu.m.	2.70	
	(0.15) (0.40) (5.85) Column 2		cu.m.	0.70	
	(0.20) (0.40) (46.00) WF		cum.	6.68	
	(0.20) (0.40) (17.20)RB-1		cu.m.	2.75	
	(0.15) (0.40) (7.00) RB-2		cu.m.	0.84	
	(0.25) (0.40) (7.00) RTB-1		cu.m.	0.70	
	(7.00) (8.00) (0.075) Slab		cu.m.	8.40	
	(2.40) (2.10) (0.075) Ramp		cu.m.	0.76	
	(1.50) (8.00) (0.075) Corr.		cu.m.	1.80	
				24.50	
			say	25.00	

(To be continued)

Table E.2.5(4-3) Estimated Costs of Two Classrooms, Elementary School

(Continuation)

Item	Quantity	Unit	Unit Cost	Total
A Materials:				
Portland Cement	225	bags	128.00	28,800.00
Sand	13	cu.m.	130.00	1,690.00
Gravel	25	cu.m.	150.00	3,750.00
Ord. Plywood	16	pcs	320.00	5,120.00
71- 2"x2"x12' Scaffords/forms	284	bd.ft.	28.00	7,952.00
CW Nails (assst)	22	kgs.	30.00	660.00
				47,972.00
B Labor:				
Carpenter	1	Person	239.68	
Masons	2	Persons	479.36	
Laborers	7	Persons	1,400.00	
	8	days	2,119.04	16,952.32
Sub-Total				64,924.32
IV Masonry Works: 134 sq.m. including Plastering				
A Materials:				
CHB 5"	1675	pcs.	5.50	9,212.50
Portland Cement	102	bags	128.00	13,056.00
Sand	11	cu.m.	130.00	1,430.00
For Plastering at both sides:				
Portland Cement	45	bgs	128.00	5,760.00
Fine Aggregates	5	cu.m.	130.00	650.00
				30,108.50
B Labor:				
Masons	2	Persons	479.36	
Laborers	2	Persons	1000.00	
	7	days	1479.36	10,355.52
Sub-Total				40,464.02
V Carpentry Works:				
A Materials:				
18- 2"x8"x18' Top Chord	432			
36- 2"x6"x12' Bottom Chord	432			
5- 2"x6"x10' Collar Plate	60			
2- 2"x6"x12' Splice Blocks	32			
16- 2"x4"x10' Cross Member	107			
9- 2"x5"x12' Wood Strap	60			
40-- 2"x3"x14' Purlins	280			
16- 2"x3"x16'	320			
30- 2"x2"x12' Wood Cleats	120			
3- 2"x5"x12' Wood Plate	30			
6- 2"x5"x12' Queen Post	60			
10- 2"x3"x12' Splice	60			
9- 2"x5'x16' Diagonal	120			
2- 2"x6"x14' Door Jamb	28			
1-2"x6"x8" Door Header	8			
	2149	bd.ft	28.00	60,162.76
4- 1"x12"x18' Facia Board	72	bd.ft		
4- 1"x12"x14' Facia Board	56	bd.ft		
4- 1"x12"x16' Fasia Board	64	bd.ft		
	192	bd.ft	32.00	6,144.00
CWN Asst.	25	kgs.	35.00	875.00
For GI Window Louvers Insect Screen	6	yard	65.00	390.00

(To be continued)

Table E.2.5(4-4) Estimated Costs of Two Classrooms, Elementary School

(Continuation)

Item	Quantity	Unit	Unit Cost	Total
GA#26x8 Plain G.I Sht	2	pcs	200.00	400.00
Window Frame 2-2"x5"14	23	bd.ft.	28.00	653.24
For Partition				
Vert. Studs 2"x3"x8'	56	bd.ft.		
Hor. Studs 2"x3"x12'	60	bd.ft.		
	116	bd.ft.	28.00	3,248.00
Ord. Plywood 1/4x8	6	yard	320.00	1,920.00
				73,793.00
B Labor:				
Carpenters	6	Persons	1438.08	
Laborers	4	Persons	800.00	
	8	days	2238.08	17,904.64
Sub-Total				91,697.64
VI Tinsmithry Works:				
A = 179 sq.m.				
A Materials				
GA# 26x10' Corr. G.I Sht.	56	pcs.	250.00	14,000.00
GA# 26x9' Corr. G.I Sht. Roll	56	pcs.	225.00	12,600.00
GA# 26x8' Ridge Roll	8	pcs.	150.00	1,200.00
GA# 26x8' End Flashing	12	pcs.	150.00	1,800.00
Vulca Seal	4	ltrs.	120.00	480.00
Roofing Nails	24	kgs.	65.00	1,560.00
				31,640.00
B Labor:				
Carpenters	4	Persons	958.72	
Laborers	2	Persons	400.00	
	3	days	1358.72	4,076.16
Sub-Total				35,716.16
VII Fabricated Materials:				
A Materials:				
Steel Casements window w/ glass putty and grills (Refer to standard plan)				
6-2.70x1.50 W1	24			
2-1.30x1.50 W2	4			
	28	sq.m.	1,300.00	36,660.00
Panel Door (Tanguile)	2	sets	2,000.00	4,000.00
Machine Bolts:				
16mmdx180mm @ Collar Plate	36	pcs	18.00	648.00
16mmdx180mm @ Splice Block	54	pcs	18.00	972.00
16mmdx180mm @ Wood Strap	54	pcs	18.00	972.00
16mmdx180mm @ End of Truss	36	pcs	18.00	648.00
16mmdx300mm Anchor Bolts	36	pcs	23.00	828.00
100mmx100mm100mmx6mm Angular Plate	36	pcs	25.00	900.00
Tension Rod w/N&W 16mmdx2.0m	9	pcs	130.00	1,170.00
Loose Pin Hinges 4"x4"	8	pcs	30.00	240.00
Door Knob	2	pcs	250.00	500.00
				47,538.00
B Labor:				
Laborers	4	Persons	958.72	
Carpenters	3	Persons	600.00	
	3	days	1558.72	4,676.16
Sub-Total				52,214.16

(To be continued)

Table E.2.5(4-5) Estimated Costs of Two Classrooms, Elementary School

(Continuation)

Item	Quantity	Unit	Unit Cost	Total
VII Pest Control/Soil Poisoning:				
A Materials:				
Chlordane	2	gal.	2,600.00	5,200.00
Cuprinol	4	gals.	350.00	1,400.00
				6,600.00
B Labor:				
Laborers	2	Persons	400.00	
Carpenters	2	Persons	479.36	
	2	days	879.36	1,758.72
Sub-Total				8,358.72
IX Painting Works(Roof Area, Ceiling Area, Walls including Col. & Beams				
Quantity = 179 sq.m.				
A Materials:				
Red Oxide Primer (1 coat)	6	gals.	275.00	1,650.00
Roof Paint (2 coat)	12	gals.	360.00	4,320.00
Flatwall Enamel (2 coat)	3	gals.	240.00	720.00
Nalcrete Paint (2 coat)	16	gals.	250.00	4,000.00
Q.D.E. (2 coat)	2	gals.	300.00	600.00
Paint Thinner	4	gals.	80.00	320.00
Paint Brush 4"	4	pcs.	60.00	240.00
Paint Brush 2"	2	pcs.	40.00	80.00
Kalsomine Powder	3	kgs.	20.00	60.00
Sand Paper	4	pcs.	10.00	40.00
Concrete Neutralizer	4	gls.	380.00	1,520.00
Tintin Color 1/4 lt	5	ltr.	50.00	250.00
				13,800.00
B Labor:				
Painters	6	persons	1,438.08	
	3	days	1,438.08	4,314.24
Sub-Total				18,114.24

TOILET

I Steel Works:				
A. Excavation: 6.71 cu.m.				
B. Backfill: 1.70 cu.m.				
A Materials:				
Mixed Sand & Gravel	2	cu.m.	110.00	220.00
B Labor: (including staking, excavation backfiling and compaction)				
Carpenter	1	person	239.68	
Laborers	3	persons	600.00	
	3	days	839.68	2,519.04
Sub-Total				2,739.04

(To be continued)

Table E.2.5(4-6) Estimated Costs of Two Classrooms, Elementary School

(Continuation)

	Item	Quantity	Unit	Unit Cost	Total
II	**Concrete Works:**				
	(0.10)(0.20)(2.80) Col.1	0.17			
	(0.10)(0.20)(2.60) Col.2	0.16			
	(0.15)(0.25)(12.00) WF	0.45			
	(1.40)(1.75)(0.075 Slab B	0.45			
	(1.40)(2.60)(0.10) Tslab	0.18			
	(0.15)(0.25)(2.80) Ftgs.	0.36			
	(2.00)(3.00)(0.075) Slab	0.11			
		1.88	cu.m.		
A	Materials:				
	Portland Cement 40 kg	17	bags	135.00	2,295.00
	Coarse Aggregate	2	cu.m.	120.00	240.00
	Fine Sand	1	cu.m.	115.00	115.00
	1/4" Ordinary Plywood	1	pc	320.00	320.00
	2x2x12 Form Lumber	36	bd.ft.	28.00	1,008.00
	CWN Asstd.	1	kg.	35.00	35.00
	Sub-Total				4,013.00
B	Labor:				
	Carpenter/Mason	2	persons	479.36	
	Laborer	1	person	200.00	
		2	days	679.36	1,358.72
	Sub-Total				5,371.72
III	**Masonry Works:**				
	A = 43.00 sq.m.				
A	Materials:				
	CHB 4"	540	pcs	4.50	2,430.00
	Portland Cement 40 kg	16	bags	135.00	2,160.00
	Mixed Sand & Gravel	2	cu.m	120.00	240.00
	For Plastering: A =61.00 sq.m.				
	Portland Cement 40 kg.	10	bags	135.00	1,350.00
	Sand	1	cu.m.	115.00	115.00
					6,295.00
B	Labor:				
	Mason/Carpenter	2	persons	479.36	
	Laborers	2	persons	400.00	
		2	days	879.36	1,758.72
	Sub-Total				8,053.72
IV	**Steel Works:**				
A	Materials:				
	6- 12mm x 6.0m. Col.	32			
	3-10mm x 6.0m. Ties	11			
	10mm x 6.0m.WF	22			
	16- 10mm x 6.0m CHB Wall	59			
	6-10mmx 6.0m T Slab	22			
	9-10mm x 6.0m CHB	33			
		180	kgs.	18.00	3,236.76
	GA# GI Tie Wire	5	kgs.	35.00	175.00
	High Speed Hacksaw Blade	1	pc	35.00	35.00
					3,446.76
B	Labor:				
	Steelman	1	person	240	
		2	days	240	479.36
	Sub-Total				3,926.12

(To be continued)

Table E.2.5(4-7) Estimated Costs of Two Classrooms, Elementary School

(Conclusion)

Item	Quantity	Unit	Unit Cost	Total
V Carpentry works:				
A Materials:				
3-2"x4"x10' Rafters	20			
5-2"x3"x14' Purlins	23			
2-2"x4"x10' Wood Plates	13			
2-1"x6"x10' Facia Board	10			
1-1"x6"x14' Facia Board	7			
6-2'X2"x8' Door Frame	16			
2-2"x4"x14' Door Jamb	19			
1-2"x4"x4' Door Heard	3			
	111	bd.ft.	28.00	3,108.00
1/4x4x8 Marine Plywood	2	pcs	350.00	700.00
Door Knob	2	sets	250.00	500.00
Loose Pin Hinges 3x3	4	pcs	20.00	80.00
CWN (Asstd.)	3	kgs	35.00	105.00
				4,493.00
B Labor:				
Carpenters	2	persons	479.36	
Laborers	1	person	200.00	
	2	days	679.36	1,358.72
Sub-Total				5,851.72
VI Tinsmithry Works:				
A = 12 sq.m.				
A Materials:				
GA # 26x10' Corr. G.I. Sht.	6	pcs	250.00	1,500.00
Roofing Nails	1	pc	65.00	65.00
Vulca Seal 1/4 lit	1	pc	40.00	40.00
				1,605.00
B Labor:				
Carpenter	1	person	239.68	
	1	day	239.68	239.68
Sub-Total				1,844.68
VII Plumbing Works:				
A Materials:				
Water Closet	2	set	250.00	500.00
P-Trap 4"	2	pcs	80.00	160.00
PVC Clean	2	pcs	70.00	140.00
PVC Wye 4"0 x 4"0	2	pcs	70.00	140.00
PVC Wye 4"0 x 2"0	2	pcs	65.00	130.00
PVC Tee 4" x 2"	2	pcs	65.00	130.00
PVC Pipe 4" x 3.0m.	2	pcs	225.00	450.00
PVC Pipe 2" x 3.0m	2	pcs	116.00	232.00
Floor Drain 4"x4"	2	pcs	25.00	50.00
Tee Soil Pipe 4"	2	pcs	65.00	130.00
Solvent Cement	1	qrt.	120.00	120.00
				2,182.00
B Labor:				
Plumber	2	persons	479.36	
	1	day	479.36	479.36
Sub-Total				2,661.36

Table E.2.5 (5-1) Estimated Costs of Barangay Health Center

Item	Cost	% Distribution
I. Estimated Cost		
A. Direct Cost:		
1. Mobilization/Demobilization		
2. Materials	132,067	57%
2.1 Supply/Delivery		
2.2 Testing of Materials		
3. Labor(including fringe benefits)	53,607	23%
4. Equipment Expenses		
Sub-total	185,674	81%
B. Indirect Cost:		
1. Overhead, Contingency, Miscellaneous (7% to 12% of A1 to A4)	12,997	6%
2. Profit (5% to 12% of A to A4)	19,037	8%
3. Comprehensive All Risk Insurance (1.5% of A1 to A4)		
4. VAT (10% of A3 to A4)	5,361	2%
Sub-total	37,395	16%
Sub-total (Contract Cost)	223,069	97%
II. Estimated Government Expenditure		
1. Engineering & Administrative Overhead (3% of A1 to A4)	6,931	3%
2. ROW/Site Acquisition/Prelim-Engineering.		
3. Materials to be furnish by the Government.		
Sub-Total		
III. Contingencies/Reserves		
1. Physical (Up to 5% of the Estimated Contract Cost)		
2. Price Escalation(up to 12% of the Estimated Cost)		
Total Estimated Cost	230,000	100%

Source : Office of the City Engineer, Laoag City, "The Construction of Health Center at Barangay #31 Talingaan, Ilocos Norte", 1996

Table E.2.5(5-2) Estimated Costs of Barangay Health Center

Item	Quantity	Unit	Unit Cost	Total
I. Concrete and Masonry				
A. Columns and Footings				
Portland Cement	40	kgs.	110.00	4,400.00
Sand	3	cu.m.	100.00	300.00
Gravel	5	cu.m.	150.00	750.00
16mm RSB	32	pcs	130.00	4,160.00
12mm RSB	23	pcs	85.00	1,955.00
10mm RSB	28	pcs	55.00	1,540.00
#16 Tie Wire	7	kls.	35.00	245.00
1/4 Plywood	7	pcs	280.00	1,960.00
2"x2"x16 forms	75	pcs	28.00	2,090.76
2"x3"X16 forms	112	pcs	28.00	3,136.00
CWN Asstd.	4	kls.	35.00	140.00
Sub-total				20,676.76
B. Concrete Beams:				
Portland Cement	12	bags	110.00	1,320.00
Sand	1	cu.m.	100.00	100.00
Gravel	2	cu.m.	150.00	300.00
16mm RSB	21	pcs	130.00	2,730.00
10mm RSB	27	pcs	55.00	1,485.00
#16 Tie Wire	5	kls	35.00	175.00
2"x2"x16 forms	53	pcs	28.00	1,493.24
2"x3"x14'forms	70	pcs	28.00	1,960.00
1/4 Plywood	4	pcs	280.00	1,120.00
#16 Tie Wire	3	kls	35.00	105.00
Sub-total				10,788.24
C. Partition and Flooring				
CHB 4"x8"x16"	780	pcs	4.50	3,510.00
Portland Cement	58	bags	110.00	6,380.00
Sand	4	cu.m.	100.00	400.00
Gravel	8	cu.m.	150.00	1,200.00
10mm RSB	42	pcs	55.00	2,310.00
#16 Tie Wire	3	kls	35.00	105.00
Sub-total				13,905.00
D Labor				
Project Engineer	1	person/d	217.54	
Const. Foreman	1	person/d	125.09	
Skilled Laborer	6	persons/d	588.00	
Laborers	10	persons/d	909.00	
Sub-total	10	days	1,839.63	18,396.30
II Carpentry:				
A Truss and Roofing				
2"x6"x14' Rafter	168	pcs	28.00	4704.00
2"x5"x18' Bottom Chord	180	pcs	28.00	5040.00
2"x5"x16' Web Member	160	pcs	28.00	4480.00
2"x6"x1' King Post	24	pcs	28.00	672.00
2"x5"x18 Collar Plate	30	pcs	28.00	840.00
2"x3"x14' Purlins	210	pcs	28.00	5880.00
1840	112	pcs	35.00	3920.00
2"x2x"20 Wood Cleats	20	pcs	28.00	560.00
#26x6' Corr. GI sht	144	pcs	28.00	4032.00
#26x8' Corr. GI sht.	192	pcs	28.00	5376.00
#26x8' Fab. Ridge roll	4	pcs	140.00	560.00

(To be continued)

Table E.2.5(5-3) Estimated Costs of Barangay Health Center

(Continuation)

Item	Quantity	Unit	Unit Cost	Total
GI Nail Twisted	18	kls	65.00	1170.00
CWN Asst.	10	kls	35.00	350.00
Sub-total				37,584.00
B Ceiling				
1/4" Marine Plywood	22	pcs	300.00	6,600.00
2"x2"x12' Ceiling Post	120	pcs	28.00	3,360.00
2"x2"x14' Ceiling Post	103	pcs	28.00	2,874.76
CWN Asstd.	5	kls	35.00	175.00
2"x6"x10' Scaffolding	60	pcs	28.00	1,680.00
2"x3"x10' Scaffolding	30	pcs	28.00	840.00
2"x2"x16' Hanger	80	pcs	28.00	2,240.00
Sub-total				17,769.76
C Labor				
Project Engineer	1	person/d	217.54	
Const. Foreman	1	person/d	125.09	
Skilled Laborer	6	persons/d	588.00	
Laborers	4	persons/d	363.60	
Sub-total	17	days	1,294.23	22,001.91
III Plastering				
A Materials				
Cement	34	bags	110.00	3,740.00
Sand	3	cu.m.	100.00	300.00
Sub-total				4,040.00
B Labor				
Project Engineer	1	person/d	217.54	
Const. Foreman	1	person/d	125.09	
Skilled Laborer	4	persons/d	392.00	
Laborers	2	persons/d	181.80	
Sub-total	4	days	916.43	3,665.72
IV Painting				
A Materials				
Primer Paint	3	gals	300.00	900.00
Roofing Paint	6	gals	320.00	1,920.00
Tintin Color	7	gals	280.00	1,960.00
Nalcrete Paint	7	lts	50.00	350.00
Tintin Color Latex	13	lts	270.00	3,510.00
Q.D.E	13	lts	45.00	585.00
Paint Thinner	2	gals	300.00	600.00
Paint Brush	8	pcs	80.00	640.00
Kalsomine	4	kls	125.00	500.00
	8	kls	20.00	160.00
Sub-total				11,125.00
B Labor				
Project Engineer	1	person/d	217.54	
Const. Foreman	1	person/d	125.09	
Skilled Laborer	4	persons/d	363.60	
Sub-total	5	days	706.23	3,531.15

(To be continued)

Table E.2.5(5-4) Estimated Costs of Barangay Health Center

(Conclusion)

Item	Quantity	Unit	Unit Cost	Total
V Doors and Windows				
A Materials				
Steel Window 1.20 x 1.20	1.44	sq.m.	950.00	1,368.00
2.10 x 1.20	7.56	sq.m.	950.00	7,182.00
Flush Door 1.0 x 2.10	1	unit	1,000.00	1,000.00
Door Jamb 2"x5"x18"	15	bd.ft	28.00	420.00
Hinges 4" x 4"	3	pcs	35.00	105.00
Cement	3	bags	110.00	330.00
MSG	1	cu.m.	100.00	50.00
Door Lock	1	pc	250.00	250.00
CWN	1	kl	35.00	35.00
Sub-total				10,740.00
B Labor				
Project Engineer	1	person/d	217.54	
Const. Foreman	1	person/d	125.09	
Skilled Laborer	4	persons/d	392.00	
Laborers	2	persons/d	181.80	
Sub-total	4	days	916.43	3,665.72
VI Electrical				
A Materials				
Incandescent Bulb	2	pcs.	30.00	60.00
Fluorescent Bulb	2	sets	220.00	440.00
Female plug	2	pcs.	12.00	24.00
Ceiling Socket	4	pcs.	25.00	100.00
One way switch	3	pcs.	45.00	135.00
Lead sheet	1	kl	49.50	49.50
3 Gang switch plate	1	pc.	45.00	45.00
Convenience outlet	2	pcs.	60.00	120.00
Junction box	5	pcs.	7.50	37.50
PVC Strap	15	pcs.	2.50	37.50
Flexible tube 3/4"	50	mts.	9.00	450.00
THW 2.0mm	35	mts.	10.00	350.00
THW 3.5mm	25	mts.	12.00	300.00
THW 8.0mm	30	mts.	23.00	690.00
Safety switch w/30-Amp fuse	1	sets	200.00	200.00
Meter Base	1	pc.	250.00	250.00
KWHR Meter (square)	1	unit	1,500.00	1,500.00
3/4" RSC	1	pc.	200.00	200.00
Screw Ball (big)	1	pc.	50.00	50.00
3/4"	1	pc.	50.00	50.00
Sub-total				5,088.50
B Labor				
Project Engineer	1	person/d	217.54	
Const. Foreman	1	person/d	125.09	
Electrician	4	persons/d	363.60	
Sub-total	3	days	706.23	2,118.69

Table E.2.6 Flood Mitigation Benefit of Objective Project in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Estimated Value of Damaged Property (Million Pesos)						
1. Direct Damage	210.9	339.1	417.0	515.9	614.1	668.1
a. Agricultural Production	55.4	72.3	79.2	87.5	95.5	103.2
- Irrigated Field	54.8	71.4	78.4	86.6	94.4	102.1
- Rainfed Field	0.6	0.9	0.9	0.9	1.0	1.1
b. Housing Units	79.4	134.1	165.6	211.2	252.6	279.6
c. Industry	9.1	13.8	15.7	18.6	21.4	23.1
- Shopping Stores	8.5	12.9	14.5	17.1	19.3	20.7
- Factories	0.7	0.9	1.2	1.6	2.1	2.4
d. Infrastructure	66.9	119.0	156.4	198.6	244.6	262.1
- Social Infrastructure	28.5	44.3	56.6	66.9	82.5	87.6
. Educational Facilities	24.0	33.5	40.7	47.7	55.4	59.1
. Medical Facilities	4.5	10.9	15.9	19.2	27.2	28.5
- Physical Infrastructure	38.4	74.6	99.8	131.7	162.1	174.5
2. Indirect Damage	20.5	30.6	36.4	43.6	51.1	55.9
3. Total	231.4	369.8	453.4	559.6	665.1	724.0
II. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	56.3	140.6	177.5	203.9	214.3	220.2
III. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	65.8	164.6	207.8	239.0	251.3	258.3
2. In the year 2010	98.3	246.5	311.4	358.4	377.1	387.7
3. In the year 2020	133.6	334.6	422.6	486.0	511.2	525.4

Table E.2.7(1) Flood Mitigation Benefit of Poblacion of Laoag in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	1.3	6.5	10.5	14.4	16.2	17.2
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	1.5	7.7	12.5	17.1	19.2	20.5
2. In the year 2010	2.3	11.9	19.3	26.3	29.4	31.4
3. In the year 2020	3.2	16.1	26.0	35.5	39.7	42.3

Table E.2.7(2) Flood Mitigation Benefit of Poblacion of San Nicolas in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	0.2	1.3	2.4	3.6	4.2	4.6
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	0.2	1.5	2.8	4.2	4.9	5.4
2. In the year 2010	0.3	2.2	4.2	6.2	7.3	8.1
3. In the year 2020	0.5	3.0	5.6	8.4	9.9	10.9

Table E.2.7(3) Flood Mitigation Benefit of Poblacion of Dingras in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	0.6	2.7	4.2	5.4	6.0	6.4
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	0.7	3.2	4.9	6.4	7.0	7.4
2. In the year 2010	1.0	4.8	7.5	9.6	10.6	11.2
3. In the year 2020	1.4	6.5	10.1	13.0	14.4	15.1

Table E.2.7(4) Flood Mitigation Benefit of Cura River Basin in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	19.7	48.6	60.5	68.3	71.2	72.7
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	23.1	57.2	71.2	80.4	83.9	85.6
2. In the year 2010	34.7	86.1	107.4	121.4	126.7	129.3
3. In the year 2020	47.3	117.1	146.0	165.0	172.2	175.7

Table E.2.7(5) Flood Mitigation Benefit of Poblacion of Solsona River Basin in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	13.9	32.5	39.6	44.4	46.2	47.2
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	16.3	38.3	46.7	52.4	54.5	55.8
2. In the year 2010	24.7	57.9	70.5	79.4	82.7	84.6
3. In the year 2020	33.6	78.7	95.9	107.9	112.3	114.9

Table E.2.7(6) Flood Mitigation Benefit of Poblacion of Madongan River Basin in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	14.0	34.1	42.3	47.8	49.8	51.0
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	16.2	39.5	48.9	55.3	57.7	59.1
2. In the year 2010	23.8	58.0	72.0	81.4	84.8	86.9
3. In the year 2020	32.3	78.5	97.4	110.1	114.8	117.4

Table E.2.7(7) Flood Mitigation Benefit of Papa River Basin in Economic Terms

Item	Return Period (Year)					
	2	5	10	25	50	100
I. Annual Benefit under Present Conditions (in Million Pesos)						
Annual Benefit	6.6	15.0	17.9	20.0	20.8	21.2
II. Projection of Annual Benefit under Future Conditions (Million Pesos at 1996 Constant Prices)						
1. In the year 2000	7.7	17.3	20.8	23.2	24.1	24.6
2. In the year 2010	11.4	25.6	30.7	34.1	35.5	36.2
3. In the year 2020	15.4	34.7	41.6	46.2	48.1	49.1

Table E.2.8 Land Loss Prevention Benefit in Economic Terms

Item	Unit	Papa River Basin	Madongan River Basin	Solsona River Basin	Cura River Basin	Total
1. Lost Areas						
Total Loss Areas	ha for 20 yeas	64.0	142.0	241.0	584.0	1,031.0
Average Lost Areas	ha/year	3.2	7.1	12.1	29.2	51.6
Cropping Pattern						
System (1)	ha	0.6	1.4	2.4	5.8	10.2
System (2)	ha	2.6	5.7	9.7	23.4	41.4
2. Lost Production Due to Land Losses						
System (1)*1	1000 Pesos/year	144.7	337.5	578.6	1,398.4	2,459.2
System (2)*2	1000 Pesos/year	48.1	105.5	178.5	432.9	765.0
Total		192.8	443.0	757.2	1,831.3	3,224.2
3. Flood Mitigation, Accounted in the lost areas						
Unit Benefit*3	1000 Pesos/year	3.24	4.71	6.19	5.92	-
Total Benefit	1000 Pesos/year	10.4	33.4	74.6	172.9	291.3
4. Benefit as Land Loss Prevention*3	1000 Pesos/year	182.4	409.5	682.6	1,658.4	2,932.9

Note: *1 Refer to Table C.5.8 in Appendix C of Part 1. Unit production rate was estimated at P241,101 per ha in economic term.
*2 Refer to Table C.5.7 in Appendix C of Part 1. Unit production rate was estimated at P18,500 per ha in economic term.
*3 Annual unit benefit of flood mitigation in croplands is quoted from Section 1.3.2 of Appendix J in Part 1.
*4 Flood mitigation benefit is subtracted from the lost production values, because of double account.

Table E.2.9 Economic Benefit Accruing from Agricultural Lands Restored

Item	Unit	Papa River Basin	Madongan River Basin	Solsona River Basin	Cura River Basin	Total
Recovered Areas						
Grazing Fields	ha	220.3	360.1	57.1	181.3	818.8
Upland Fields	ha	11.8	291.2	0.8	208.8	512.6
Lowland Fields	ha	0.0	227.8	62.9	210.8	501.5
Total	ha	232.1	879.1	120.8	600.9	1,832.9
Benefits						
Livestock Production	1000 Pesos/year	0.0	0.0	0.0	0.0	0.0
Upland Production*1	1000 Pesos/year	27.1	669.8	1.8	480.2	1,179.0
Lowland Production*	1000 Pesos/year	0.0	1,845.2	509.5	1,707.5	4,062.2
Total	1000 Pesos/year	27.1	2,514.9	511.3	2,187.7	5,241.1

Note: *1 Refer to Table C.5.9 in Appendix C of Part 1. Unit production rate was estimated at P2,300 per ha in economic term.
*2 Refer to Table C.5.7 in Appendix C of Part 1. Unit production rate was estimated at P8,100 per ha in economic term.

Table E.2.10(1) Conversion Factor by Work Types

1. Sabo Dam

(1) Excavation (Gravel/Boulder) of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	7	2	-	0	5	-	6	6
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	7	2	0.05	0	5	1.21	6	6
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	56	16	0.57	9	40	1.11	44	54
3. Labor	3	3	-	3	0	-	0	3
a. Skilled Workers	3	3	0.93	3	0	0.00	0	3
b. Unskilled Workers	0	0	0.60	0	0	0.00	0	0
4. Indirect Costs	19	19	-	9	0	-	0	9
a. Overhead & Miscellaneous	6	6	0.86	5	0	0.00	0	5
b. Profit	6	6	0.65	4	0	0.00	0	4
c. VAT*1	7	7	0.00	0	0	0.00	0	0
Total	85	40	-	21	45	-	50	72
Conversion Factor								0.84

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(2) Conversion Factor by Work Types

1. Sabo Dam

(2) Excavation (Rock) of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	23	7	-	0	16	-	19	20
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	23	7	0.05	0	16	1.21	19	20
e. Lumber	0	0	0.80		0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	196	59	0.57	34	137	1.11	152	186
3. Labor	226	226	-	190	0	-	0	190
a. Skilled Workers	164	164	0.93	153	0	0.00	0	153
b. Unskilled Workers	62	62	0.60	37	0	0.00	0	37
4. Indirect Costs	135	135	-	68	0	-	0	68
a. Overhead & Miscellaneous	45	45	0.86	39	0	0.00	0	39
b. Profit	45	45	0.65	29	0	0.00	0	29
c. VAT*1	45	45	0.00	0	0	0.00	0	0
Total	580	427	-	292	153	-	171	463
Conversion Factor								0.80

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(3) Conversion Factor by Work Types

1. Sabo Dam

(3) Stone Concrete of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	1,071	416	-	128	655	-	691	820
a. Cement	800	240	0.53	127	560	1.04	582	710
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	80	20	0.05	1	60	1.21	73	74
e. Lumber	191	156	0.80		35	1.04	36	36
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	610	180	0.57	103	430	1.11	477	580
3. Labor	579	579	-	458	0	-	0	458
a. Skilled Workers	334	334	0.93	311	0	0.00	0	311
b. Unskilled Workers	245	245	0.60	147	0	0.00	0	147
4. Indirect Costs	540	540	-	317	0	-	0	317
a. Overhead & Miscellaneous	210	210	0.86	181	0	0.00	0	181
b. Profit	210	210	0.65	137	0	0.00	0	137
c. VAT*1	120	120	0.00	0	0	0.00	0	0
Total	2,800	1,715	-	1,006	1,085	-	1,169	2,174
Conversion Factor								0.78

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(4) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(1) Channel Excavation of 1.0 m³

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	4	1	-	0	3	-	4	4
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	4	1	0.05	0	3	1.21	4	4
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	44	13	0.57	7	31	1.11	34	42
3. Labor	2	2	-	2	0	-	0	2
a. Skilled Workers	2	2	0.93	2	0	0.00	0	2
b. Unskilled Workers	0	0	0.60	0	0	0.00	0	0
4. Indirect Costs	16	16	-	8	0	-	0	8
a. Overhead & Miscellaneous	5	5	0.86	4	0	0.00	0	4
b. Profit	5	5	0.65	3	0	0.00	0	3
c. VAT*1	6	6	0.00	0	0	0.00	0	0
Total	66	32	-	17	34	-	38	55
Conversion Factor								0.83

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(5) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(2) Site Clearing of 1.0 m^2

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	3	1	-	0	2	-	2	2
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	3	1	0.05	0	2	1.21	2	2
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	30	9	0.57	5	21	1.11	23	28
3. Labor	6	6	-	5	0	-	0	5
a. Skilled Workers	4	4	0.93	4	0	0.00	0	4
b. Unskilled Workers	2	2	0.60	1	0	0.00	0	1
4. Indirect Costs	11	11	-	5	0	-	0	5
a. Overhead & Miscellaneous	3	3	0.86	3	0	0.00	0	3
b. Profit	4	4	0.65	3	0	0.00	0	3
c. VAT*1	4	4	0.00	0	0	0.00	0	0
Total	50	27	-	15	23	-	26	41
Conversion Factor								**0.82**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(6) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(3) Embankment (use excavated material) of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	5	1	-	0	4	-	5	5
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	5	1	0.05	0	4	1.21	5	5
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	43	12	0.57	7	31	1.11	34	41
3. Labor	1	1	-	1	0	-	0	1
a. Skilled Workers	1	1	0.93	1	0	0.00	0	1
b. Unskilled Workers	0	0	0.60	0	0	0.00	0	0
4. Indirect Costs	15	15	-	8	0	-	0	8
a. Overhead & Miscellaneous	5	5	0.86	4	0	0.00	0	4
b. Profit	5	5	0.65	3	0	0.00	0	3
c. VAT*1	5	5	0.00	0	0	0.00	0	0
Total	64	29	-	15	35	-	39	55
Conversion Factor								0.85

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(7) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(4) Gravel Maintenance Road of 1.0 m^2

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	3	1	-	0	2	-	2	2
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	3	1	0.05	0	2	1.21	2	2
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	14	3	0.57	2	11	1.11	12	14
3. Labor	2	2	-	2	0	-	0	2
a. Skilled Workers	1	1	0.93	1	0	0.00	0	1
b. Unskilled Workers	1	1	0.60	1	0	0.00	0	1
4. Indirect Costs	6	6	-	3	0	-	0	3
a. Overhead & Miscellaneous	2	2	0.86	2	0	0.00	0	2
b. Profit	2	2	0.65	1	0	0.00	0	1
c. VAT*1	2	2	0.00	0	0	0.00	0	0
Total	25	12	-	6	13	-	15	21
Conversion Factor								0.84

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(8) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(5) Spur Dike (Type-A) of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	117,060	39,560	-	20,832	77,500	-	81,681	102,514
a. Cement	59,895	17,985	0.53	9,532	41,910	1.04	43,586	53,118
b. Aggregate (Coarse & Fine)	21,285	13,200	0.68	8,976	8,085	1.06	8,570	17,546
c. Steel	30,600	6,120	0.24	1,469	24,480	1.06	25,949	27,418
d. Fuel & Lubricant	3,795	1,265	0.05	63	2,530	1.21	3,061	3,125
e. Lumber	1,485	990	0.80	792	495	1.04	515	1,307
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	30,345	8,920	0.57	5,084	21,425	1.11	23,782	28,866
3. Labor	117,479	117,479	-	83,951	0	-	0	83,951
a. Skilled Workers	40,799	40,799	0.93	37,943	0	0.00	0	37,943
b. Unskilled Workers	76,680	76,680	0.60	46,008	0	0.00	0	46,008
4. Indirect Costs	69,406	69,406	-	41,181	0	-	0	41,181
a. Overhead & Miscellaneous	27,272	27,272	0.86	23,454	0	0.00	0	23,454
b. Profit	27,272	27,272	0.65	17,727	0	0.00	0	17,727
c. VAT*1	14,862	14,862	0.00	0	0	0.00	0	0
Total	334,290	235,365	-	151,048	98,925	-	105,463	256,511
Conversion Factor								0.77

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(9) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(6) Spur Dike (Type-B) of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	130,230	44,650	-	23,767	85,580	-	90,182	113,949
a. Cement	68,970	20,710	0.53	10,976	48,260	1.04	50,190	61,167
b. Aggregate (Coarse & Fine)	24,510	15,200	0.68	10,336	9,310	1.06	9,869	20,205
c. Steel	30,600	6,120	0.24	1,469	24,480	1.06	25,949	27,418
d. Fuel & Lubricant	4,440	1,480	0.05	74	2,960	1.21	3,582	3,656
e. Lumber	1,710	1,140	0.80	912	570	1.04	593	1,505
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	35,490	10,400	0.57	5,928	25,090	1.11	27,850	33,778
3. Labor	134,344	134,344	-	96,006	0	-	0	96,006
a. Skilled Workers	46,664	46,664	0.93	43,398	0	0.00	0	43,398
b. Unskilled Workers	87,680	87,680	0.60	52,608	0	0.00	0	52,608
4. Indirect Costs	78,916	78,916	-	46,692	0	-	0	46,692
a. Overhead & Miscellaneous	30,922	30,922	0.86	26,593	0	0.00	0	26,593
b. Profit	30,922	30,922	0.65	20,099	0	0.00	0	20,099
c. VAT*1	17,072	17,072	0.00	0	0	0.00	0	0
Total	378,980	268,310	-	172,393	110,670	-	118,032	290,425
Conversion Factor								0.77

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(10) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(7) Spur Dike (Type-C) of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	152,319	53,189	-	28,697	99,130	-	104,434	133,131
a. Cement	84,216	25,288	0.53	13,403	58,928	1.04	61,285	74,688
b. Aggregate (Coarse & Fine)	29,928	18,560	0.68	12,621	11,368	1.06	12,050	24,671
c. Steel	30,600	6,120	0.24	1,469	24,480	1.06	25,949	27,418
d. Fuel & Lubricant	5,487	1,829	0.05	91	3,658	1.21	4,426	4,518
e. Lumber	2,088	1,392	0.80	1,114	696	1.04	724	1,837
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	43,782	12,846	0.57	7,322	30,936	1.11	34,339	41,661
3. Labor	162,665	162,665	-	116,246	0	-	0	116,246
a. Skilled Workers	56,505	56,505	0.93	52,550	0	0.00	0	52,550
b. Unskilled Workers	106,160	106,160	0.60	63,696	0	0.00	0	63,696
4. Indirect Costs	94,764	94,764	-	55,881	0	-	0	55,881
a. Overhead & Miscellaneous	37,007	37,007	0.86	31,826	0	0.00	0	31,826
b. Profit	37,007	37,007	0.65	24,055	0	0.00	0	24,055
c. VAT*1	20,750	20,750	0.00	0	0	0.00	0	0
Total	453,530	323,464	-	208,146	130,066	-	138,773	346,919
Conversion Factor								0.76

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(11) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(8) Spur Dike (Type-D) of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	167,001	58,867	-	31,983	108,134	-	113,900	145,883
a. Cement	94,380	28,340	0.53	15,020	66,040	1.04	68,682	83,702
b. Aggregate (Coarse & Fine)	33,540	20,800	0.68	14,144	12,740	1.06	13,504	27,648
c. Steel	30,600	6,120	0.24	1,469	24,480	1.06	25,949	27,418
d. Fuel & Lubricant	6,141	2,047	0.05	102	4,094	1.21	4,954	5,056
e. Lumber	2,340	1,560	0.80	1,248	780	1.04	811	2,059
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	48,995	14,381	0.57	8,197	34,614	1.11	38,422	46,619
3. Labor	181,531	181,531	-	129,725	0	-	0	129,725
a. Skilled Workers	63,051	63,051	0.93	58,637	0	0.00	0	58,637
b. Unskilled Workers	118,480	118,480	0.60	71,088	0	0.00	0	71,088
4. Indirect Costs	105,213	105,213	-	61,940	0	-	0	61,940
a. Overhead & Miscellaneous	41,020	41,020	0.86	35,277	0	0.00	0	35,277
b. Profit	41,020	41,020	0.65	26,663	0	0.00	0	26,663
c. VAT*1	23,173	23,173	0.00	0	0	0.00	0	0
Total	502,740	359,992	-	231,846	142,748	-	152,321	384,167
Conversion Factor								**0.76**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(12) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(9) Intake Sluiceway (Type-A) of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	525,364	153,752	-	73,436	371,612	-	391,800	465,237
a. Cement	155,085	49,403	0.53	26,184	105,682	1.04	109,909	136,093
b. Aggregate (Coarse & Fine)	43,165	25,848	0.68	17,577	17,317	1.06	18,356	35,933
c. Steel	291,843	58,128	0.24	13,951	233,715	1.06	247,738	261,689
d. Fuel & Lubricant	2,547	764	0.05	38	1,783	1.21	2,157	2,196
e. Lumber	32,724	19,609	0.80	15,687	13,115	1.04	13,640	29,327
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent	23,428	7,512	0.57	4,282	15,916	1.11	17,667	21,949
3. Labor	181,696	181,696	-	141,245	0	-	0	141,245
a. Skilled Workers	97,660	97,660	0.93	90,824	0	0.00	0	90,824
b. Unskilled Workers	84,036	84,036	0.60	50,422	0	0.00	0	50,422
4. Indirect Costs	169,512	169,512	-	111,159	0	-	0	111,159
a. Overhead & Miscellaneous	73,615	73,615	0.86	63,309	0	0.00	0	63,309
b. Profit	73,615	73,615	0.65	47,850	0	0.00	0	47,850
c. VAT*1	22,282	22,282	0.00	0	0	0.00	0	0
Total	900,000	512,472	-	330,122	387,528	-	409,467	739,589
Conversion Factor								**0.82**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(13) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(10) Intake Sluiceway (Type-B) of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	1,050,728	307,504	-	146,873	743,224	-	783,600	930,473
a. Cement	310,170	98,806	0.53	52,367	211,364	1.04	219,819	272,186
b. Aggregate (Coarse & Fine)	86,330	51,696	0.68	35,153	34,634	1.06	36,712	71,865
c. Steel	583,686	116,256	0.24	27,901	467,430	1.06	495,476	523,377
d. Fuel & Lubricant	5,094	1,528	0.05	76	3,566	1.21	4,315	4,391
e. Lumber	65,448	39,218	0.80	31,374	26,230	1.04	27,279	58,654
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	46,856	15,024	0.57	8,564	31,832	1.11	35,334	43,897
3. Labor	363,392	363,392	-	282,491	0	-	0	282,491
a. Skilled Workers	195,320	195,320	0.93	181,648	0	0.00	0	181,648
b. Unskilled Workers	168,072	168,072	0.60	100,843	0	0.00	0	100,843
4. Indirect Costs	339,024	339,024	-	222,317	0	-	0	222,317
a. Overhead & Miscellaneous	147,230	147,230	0.86	126,618	0	0.00	0	126,618
b. Profit	147,230	147,230	0.65	95,700	0	0.00	0	95,700
c. VAT*1	44,564	44,564	0.00	0	0	0.00	0	0
Total	1,800,000	1,024,944	-	660,244	775,056	-	818,934	1,479,178
Conversion Factor								**0.82**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(14) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(11) Structural Excavation of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	3	1	-	0	2	-	2	2
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	3	1	0.05	0	2	1.21	2	2
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	30	8	0.57	5	22	1.11	24	29
3. Labor	1	1	-	1	0	-	0	1
a. Skilled Workers	1	1	0.93	1	0	0.00	0	1
b. Unskilled Workers	0	0	0.60	0	0	0.00	0	0
4. Indirect Costs	11	11	-	6	0	-	0	6
a. Overhead & Miscellaneous	4	4	0.86	3	0	0.00	0	3
b. Profit	4	4	0.65	3	0	0.00	0	3
c. VAT*1	3	3	0.00	0	0	0.00	0	0
Total	45	21	-	12	24	-	27	38
Conversion Factor								0.85

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(15) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(12) Stone Concrete of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	507	197	-	117	310	-	324	441
a. Cement	363	109	0.53	58	254	1.04	264	322
b. Aggregate (Coarse & Fine)	129	80	0.68	54	49	1.06	52	106
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	6	2	0.05	0	4	1.21	5	5
e. Lumber	9	6	0.80	5	3	1.04	3	8
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	51	18	0.57	10	33	1.11	37	47
3. Labor	668	668	-	476	0	-	0	476
a. Skilled Workers	228	228	0.93	212	0	0.00	0	212
b. Unskilled Workers	440	440	0.60	264	0	0.00	0	264
4. Indirect Costs	324	324	-	189	0	-	0	189
a. Overhead & Miscellaneous	125	125	0.86	108	0	0.00	0	108
b. Profit	125	125	0.65	81	0	0.00	0	81
c. VAT*1	74	74	0.00	0	0	0.00	0	0
Total	1,550	1,207	-	792	343	-	361	1,153
Conversion Factor								0.74

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(16) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(13) Concrete Brock of 1.0 m^3 (Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	1,476	567	-	336	909	-	950	1,286
a. Cement	1,061	318	0.53	169	743	1.04	773	941
b. Aggregate (Coarse & Fine)	375	229	0.68	156	146	1.06	155	310
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	17	6	0.05	0	11	1.21	13	14
e. Lumber	23	14	0.80	11	9	1.04	9	21
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	154	53	0.57	30	101	1.11	112	142
3. Labor	319	319	-	250	0	-	0	250
a. Skilled Workers	179	179	0.93	166	0	0.00	0	166
b. Unskilled Workers	140	140	0.60	84	0	0.00	0	84
4. Indirect Costs	451	451	-	300	0	-	0	300
a. Overhead & Miscellaneous	199	199	0.86	171	0	0.00	0	171
b. Profit	199	199	0.65	129	0	0.00	0	129
c. VAT*1	53	53	0.00	0	0	0.00	0	0
Total	2,400	1,390	-	917	1,010	-	1,062	1,979
Conversion Factor								**0.82**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(17) Conversion Factor by Work Types

2. Alluvial Fan River Improvement
(14) Bridge Extension

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	17,600	5,730	-	3,018	11,870	-	12,487	15,506
a. Cement	6,974	2,222	0.53	1,178	4,752	1.04	4,942	6,120
b. Aggregate (Coarse & Fine)	1,941	1,162	0.68	790	779	1.06	826	1,616
c. Steel	7,099	1,430	0.24	343	5,669	1.06	6,009	6,352
d. Fuel & Lubricant	114	34	0.05	2	80	1.21	97	99
e. Lumber	1,472	882	0.80	706	590	1.04	614	1,319
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	2,500	750	0.57	428	1,750	1.11	1,943	2,370
3. Labor	2,500	2,500	-	1,896	0	-	0	1,896
a. Skilled Workers	1,200	1,200	0.93	1,116	0	0.00	0	1,116
b. Unskilled Workers	1,300	1,300	0.60	780	0	0.00	0	780
4. Indirect Costs	5,400	5,400	-	3,700	0	-	0	3,700
a. Overhead & Miscellaneous	2,450	2,450	0.86	2,107	0	0.00	0	2,107
b. Profit	2,450	2,450	0.65	1,593	0	0.00	0	1,593
c. VAT*1	500	500	0.00	0	0	0.00	0	0
Total	28,000	14,380	-	9,041	13,620	-	14,430	23,471
Conversion Factor								0.84

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(18) Conversion Factor by Work Types

2. Alluvial Fan River Improvement

(15) Embankment (including Hauling) of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	9	2	-	0	7	-	8	9
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	9	2	0.05	0	7	1.21	8	9
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	87	25	0.57	14	62	1.11	69	83
3. Labor	3	3	-	3	0	-	0	3
a. Skilled Workers	3	3	0.93	3	0	0.00	0	3
b. Unskilled Workers	0	0	0.60	0	0	0.00	0	0
4. Indirect Costs	31	31	-	15	0	-	0	15
a. Overhead & Miscellaneous	10	10	0.86	9	0	0.00	0	9
b. Profit	10	10	0.65	7	0	0.00	0	7
c. VAT*1	11	11	0.00	0	0	0.00	0	0
Total	130	61	-	32	69	-	77	110
Conversion Factor								0.84

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(19) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(1) Site Clearing of 1.0 m^2

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	3	1	-	0	2	-	2	2
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	3	1	0.05	0	2	1.21	2	2
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	30	9	0.57	5	21	1.11	23	28
3. Labor	6	6	-	5	0	-	0	5
a. Skilled Workers	4	4	0.93	4	0	0.00	0	4
b. Unskilled Workers	2	2	0.60	1	0	0.00	0	1
4. Indirect Costs	11	11	-	5	0	-	0	5
a. Overhead & Miscellaneous	3	3	0.86	3	0	0.00	0	3
b. Profit	4	4	0.65	3	0	0.00	0	3
c. VAT*1	4	4	0.00	0	0	0.00	0	0
Total	50	27	-	15	23	-	26	41
Conversion Factor								**0.82**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(20) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(2) Embankment of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	10	3	-	0	7	-	8	9
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	0	0	0.68	0	0	1.06	0	0
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	10	3	0.05	0	7	1.21	8	9
e. Lumber		0	0.80		0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	81	22	0.57	13	59	1.11	65	78
3. Labor	6	6	-	5	0	-	0	5
a. Skilled Workers	5	5	0.93	5	0	0.00	0	5
b. Unskilled Workers	1	1	0.60	1	0	0.00	0	1
4. Indirect Costs	28	28	-	14	0	-	0	14
a. Overhead & Miscellaneous	9	9	0.86	8	0	0.00	0	8
b. Profit	9	9	0.65	6	0	0.00	0	6
c. VAT*1	10	10	0.00	0	0	0.00	0	0
Total	125	59	-	32	66	-	74	105
Conversion Factor								**0.84**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(21) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(3) Gravel Maintenance Road of 1.0 m^2

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	51	30	-	20	21	-	22	42
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	49	29	0.68	20	20	1.06	21	41
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	2	1	0.05	0	1	1.21	1	1
e. Lumber		0	0.80		0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	5	2	0.57	1	3	1.11	3	4
3. Labor	1	1	-	1	0	-	0	1
a. Skilled Workers	1	1	0.93	1	0	0.00	0	1
b. Unskilled Workers	0	0	0.60	0	0	0.00	0	0
4. Indirect Costs	13	13	-	9	0	-	0	9
a. Overhead & Miscellaneous	6	6	0.86	5	0	0.00	0	5
b. Profit	6	6	0.65	4	0	0.00	0	4
c. VAT*1	1	1	0.00	0	0	0.00	0	0
Total	70	46	-	31	24	-	26	57
Conversion Factor								**0.81**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(22) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(4) Concrete Sheet Pile of 1.0 m^2

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	896	288	-	119	608	-	649	768
a. Cement	365	116	0.53	61	249	1.04	259	320
b. Aggregate (Coarse & Fine)	102	61	0.68	41	41	1.06	43	85
c. Steel	298	60	0.24	14	238	1.06	252	267
d. Fuel & Lubricant	93	28	0.05	1	65	1.21	79	80
e. Lumber	38	23	0.80		15	1.04	16	16
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	797	240	0.57	137	557	1.11	618	755
3. Labor	464	464	-	359	0	-	0	359
a. Skilled Workers	245	245	0.93	228	0	0.00	0	228
b. Unskilled Workers	219	219	0.60	131	0	0.00	0	131
4. Indirect Costs	543	543	-	313	0	-	0	313
a. Overhead & Miscellaneous	207	207	0.86	178	0	0.00	0	178
b. Profit	207	207	0.65	135	0	0.00	0	135
c. VAT*1	129	129	0.00	0	0	0.00	0	0
Total	2,700	1,535	-	927	1,165	-	1,267	2,195
Conversion Factor								**0.81**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(23) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(5) Footing Concrete of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	2,117	723	-	389	1,394	-	1,463	1,852
a. Cement	1,218	388	0.53	206	830	1.04	863	1,069
b. Aggregate (Coarse & Fine)	339	203	0.68	138	136	1.06	144	282
c. Steel	496	100	0.24	24	396	1.06	420	444
d. Fuel & Lubricant	21	6	0.05	0	15	1.21	18	18
e. Lumber	43	26	0.80	21	17	1.04	18	38
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	197	59	0.57	34	138	1.11	153	187
3. Labor	548	548	-	430	0	-	0	430
a. Skilled Workers	306	306	0.93	285	0	0.00	0	285
b. Unskilled Workers	242	242	0.60	145	0	0.00	0	145
4. Indirect Costs	638	560	-	423	0	-	0	423
a. Overhead & Miscellaneous	280	280	0.86	241	0	0.00	0	241
b. Profit	280	280	0.65	182	0	0.00	0	182
c. VAT*1	78	78	0.00	0	0	0.00	0	0
Total	3,500	1,890	-	1,275	1,532	-	1,616	2,891
Conversion Factor								**0.83**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(24) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(6) Gravel Base of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	324	194	-	132	130	-	138	270
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	324	194	0.68	132	130	1.06	138	270
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	0	0	0.05	0	0	1.21	0	0
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	0	0	0.57	0	0	1.11	0	0
3. Labor	94	94	-	56	0	-	0	56
a. Skilled Workers	0	0	0.93	0	0	0.00	0	0
b. Unskilled Workers	94	94	0.60	56	0	0.00	0	56
4. Indirect Costs	92	84	-	63	0	-	0	63
a. Overhead & Miscellaneous	42	42	0.86	36	0	0.00	0	36
b. Profit	42	42	0.65	27	0	0.00	0	27
c. VAT*1	8	8	0.00	0	0	0.00	0	0
Total	510	372	-	252	130	-	138	390
Conversion Factor								0.76

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(25) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(7) Grouted Stone Pitching of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	526	223	-	138	303	-	317	455
a. Cement	307	92	0.53	49	215	1.04	224	272
b. Aggregate (Coarse & Fine)	190	115	0.68	78	75	1.06	80	158
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	5	2	0.05	0	3	1.21	4	4
e. Lumber	24	14	0.80	11	10	1.04	10	22
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	46	16	0.57	9	30	1.11	33	42
3. Labor	982	982	-	766	0	-	0	766
a. Skilled Workers	536	536	0.93	498	0	0.00	0	498
b. Unskilled Workers	446	446	0.60	268	0	0.00	0	268
4. Indirect Costs	396	298	-	225	0	-	0	225
a. Overhead & Miscellaneous	149	149	0.86	128	0	0.00	0	128
b. Profit	149	149	0.65	97	0	0.00	0	97
c. VAT*1	98	98	0.00	0	0	0.00	0	0
Total	1,950	1,519	-	1,138	333	-	350	1,489
Conversion Factor								0.76

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(26) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(8) R. C. Wall of 1.0 m^3

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	3,074	1,001	-	527	2,073	-	2,181	2,708
a. Cement	1,218	388	0.53	206	830	1.04	863	1,069
b. Aggregate (Coarse & Fine)	339	203	0.68	138	136	1.06	144	282
c. Steel	1,240	250	0.24	60	990	1.06	1,049	1,109
d. Fuel & Lubricant	20	6	0.05	0	14	1.21	17	17
e. Lumber	257	154	0.80	123	103	1.04	107	230
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	184	59	0.57	34	125	1.11	139	172
3. Labor	1,427	1,427	-	1,109	0	-	0	1,109
a. Skilled Workers	767	767	0.93	713	0	0.00	0	713
b. Unskilled Workers	660	660	0.60	396	0	0.00	0	396
4. Indirect Costs	1,115	940	-	710	0	-	0	710
a. Overhead & Miscellaneous	470	470	0.86	404	0	0.00	0	404
b. Profit	470	470	0.65	306	0	0.00	0	306
c. VAT*1	175	175	0.00	0	0	0.00	0	0
Total	5,800	3,427	-	2,380	2,198	-	2,320	4,699
Conversion Factor								**0.81**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(27) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement
(9) Drainage Sluiceway of 1 Unit

(Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	758,616	222,184	-	83,452	536,432	-	565,571	649,023
a. Cement	224,112	71,392	0.53	37,838	152,720	1.04	158,829	196,667
b. Aggregate (Coarse & Fine)	62,376	37,352	0.68	25,399	25,024	1.06	26,525	51,925
c. Steel	421,160	84,000	0.24	20,160	337,160	1.06	357,390	377,550
d. Fuel & Lubricant	3,680	1,104	0.05	55	2,576	1.21	3,117	3,172
e. Lumber	47,288	28,336	0.80		18,952	1.04	19,710	19,710
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	33,856	10,856	0.57	6,188	23,000	1.11	25,530	31,718
3. Labor	262,568	262,568	-	204,113	0	-	0	204,113
a. Skilled Workers	141,128	141,128	0.93	131,249	0	0.00	0	131,249
b. Unskilled Workers	121,440	121,440	0.60	72,864	0	0.00	0	72,864
4. Indirect Costs	244,960	244,960	-	160,634	0	-	0	160,634
a. Overhead & Miscellaneous	106,380	106,380	0.86	91,487	0	0.00	0	91,487
b. Profit	106,380	106,380	0.65	69,147	0	0.00	0	69,147
c. VAT*1	32,200	32,200	0.00	0	0	0.00	0	0
Total	1,300,000	740,568	-	454,387	559,432	-	591,101	1,045,488
Conversion Factor								**0.80**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.10(28) Conversion Factor by Work Types

3. Laoag-Bongo River Improvement

(10) Spur Dike of 1.0 m^3 (Unit: Pesos)

Item	Total Construction Cost in Financial Value	Local Currency Portion			Foreign Currency Portion			Total Construction Cost in Economic Value
		Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	Construction Cost in Financial Value	Conversion Rate	Construction Cost in Economic Value	
Main Work								
1. Materials	234	138	-	94	96	-	102	196
a. Cement	0	0	0.53	0	0	1.04	0	0
b. Aggregate (Coarse & Fine)	234	138	0.68	94	96	1.06	102	196
c. Steel	0	0	0.24	0	0	1.06	0	0
d. Fuel & Lubricant	0	0	0.05	0	0	1.21	0	0
e. Lumber	0	0	0.80	0	0	1.04	0	0
f. Others	0	0	0.72	0	0	1.05	0	0
2. Machinery & Equipment Rent:	0	0	0.57	0	0	1.11	0	0
3. Labor	236	236	-	172	0	-	0	172
a. Skilled Workers	92	92	0.93	86	0	0.00	0	86
b. Unskilled Workers	144	144	0.60	86	0	0.00	0	86
4. Indirect Costs	120	96	-	72	0	-	0	72
a. Overhead & Miscellaneous	48	48	0.86	41	0	0.00	0	41
b. Profit	48	48	0.65	31	0	0.00	0	31
c. VAT*1	24	24	0.00	0	0	0.00	0	0
Total	590	470	-	338	96	-	102	440
Conversion Factor								**0.75**

Note: *1 Imposed on (2) Machinery & Equipment Rental and (3) Labor only.

Table E.2.11 Conversion Factor of Work Types

	Work Item	Conversion Factor
I.	Sabo Dam	
	(1) Excavation (Gravel/Boulder)	0.84
	(2) Excavation (Rock)	0.80
	(3) Stone Concrete	0.78
II.	Alluvial Fan River Improvement	
	(1) Channel Excavation	0.83
	(2) Site Clearing	0.82
	(3) Embankment (use excavated material)	0.85
	(4) Gravel Maintenance Road	0.84
	(5) Spur Dike (Type-A)	0.77
	(6) Spur Dike (Type-B)	0.77
	(7) Spur Dike (Type-C)	0.76
	(8) Spur Dike (Type-D)	0.76
	(9) Intake Sluiceway (Type-A)	0.82
	(10) Intake Sluiceway (Type-B)	0.82
	(11) Structural Excavation	0.85
	(12) Stone Concrete	0.74
	(13) Concrete Brock	0.82
	(14) Bridge Extension	0.84
	(15) Embankment (including Hauling)	0.84
III.	Laoag-Bongo River Improvement	
	(1) Site Clearing	0.82
	(2) Embankment	0.84
	(3) Gravel Maintenance Road	0.81
	(4) Concrete Sheet Pile	0.81
	(5) Footing Concrete	0.83
	(6) Gravel Base	0.76
	(7) Grouted Stone Pitching	0.76
	(8) R. C. Wall	0.81
	(9) Drainage Sluiceway	0.80
	(10) Spur Dike	0.75

Table E.2.12(1) Financial and Economic Costs of Objective Project

(1) Sabo Dams

	Work Item	Financial Costs (Million Pesos)	Conversion Factor *1	Economic Costs (Million Pesos)
(1)	Cura Sabo Dam No.1	46.0	*0.78*	36.0
	a) Excavation (Gravel/Boulder)	2.6	0.84	2.2
	b) Excavation (Rock)	1.1	0.80	0.9
	c) Main Dam Stone Concrete	26.0	0.78	20.3
	d) Sub-dam Stone Concrete	7.0	0.78	5.5
	e) Apron Stone Concrete	9.2	0.78	7.2
(2)	Labugaon Sabo Dam No.1	55.8	*0.78*	43.7
	a) Excavation (Gravel/Boulder)	1.5	0.84	1.3
	b) Excavation (Rock)	7.0	0.80	5.6
	c) Main Dam Stone Concrete	39.5	0.78	30.8
	d) Sub-dam Stone Concrete	7.8	0.78	6.1
(3)	Solsona Sabo Dam No.1	17.7	*0.78*	13.9
	a) Excavation (Gravel/Boulder)	0.2	0.84	0.1
	b) Excavation (Rock)	3.0	0.80	2.4
	c) Main Stone Concrete	12.6	0.78	9.8
	d) Sub-dam Stone Concrete	2.0	0.78	1.5
(4)	Madongan Sabo Dam	61.7	*0.78*	48.3
	a) Excavation (Gravel/Boulder)	1.3	0.84	1.1
	b) Excavation (Rock)	2.1	0.80	1.7
	c) Main Dam Stone Concrete	33.9	0.78	26.4
	d) Sub-dam Stone Concrete	8.7	0.78	6.8
	e) Apron Stone Concrete	15.7	0.78	12.2
(5)	Papa Sabo Dam	50.9	*0.78*	39.8
	a) Excavation (Gravel/Boulder)	1.8	0.84	1.5
	b) Excavation (Rock)	1.8	0.80	1.4
	c) Main Dam Stone Concrete	33.3	0.78	26.0
	d) Sub-dam Stone Concrete	7.3	0.78	5.7
	e) Apron Stone Concrete	6.7	0.78	5.2
	Total	232.1	*0.78*	181.8

Note *1 Refer to Table E.1.12.
*2 Italic figures of the conversion factors are calculated as a comprehensive factor based on the results of work types.

Table E.2.12(2) Financial and Economic Costs of Objective Project

(2) Alluvial Fan River Improvement

	Work Item			Financial Costs (Mil. Pesos)	Conversion Factor *1	Economic Costs (Mil. Pesos)
A.	Cura/Labugaon River Improvement			300.7	*0.81*	243.4
	(1) Channel Excavation			65.5	0.83	54.3
	(2) Earth Dike	a)	Site Clearing	19.4	0.82	15.9
		b)	Embankment (use excavated material)	63.5	0.85	54.0
		c)	Gravel Maintenance Road	1.3	0.84	1.1
	(3) Spur Dike	a)	Type-A	93.9	0.77	72.3
		b)	Type-B	25.8	0.77	19.8
	(4) Intake Sluiceway (Type-A)			3.6	0.82	3.0
	(5) Groundsill	a)	Structural Excavation	0.2	0.85	0.1
		b)	Stone Concrete	2.6	0.74	1.9
		c)	Concrete Block	2.3	0.82	1.9
	(6) Bridge (Excavation of Bagbag Bridge)			22.7	0.84	19.1
B.	Solsona River Improvement			174.0	*0.78*	135.4
	(1) Earth Dike	a)	Site Clearing	1.8	0.82	1.5
		b)	Embankment (incl. Hauling)	26.9	0.84	22.6
		c)	Gravel Maintenance Road	1.0	0.84	0.8
	(2) Spur Dike	a)	Type-A	17.0	0.77	13.1
		b)	Type-B	29.9	0.77	23.1
		c)	Type-C	86.5	0.76	65.7
	(3) Intake Sluiceway (Type-A)			2.7	0.82	2.2
	(4) Groundsill	a)	Structural Excavation	0.3	0.85	0.2
		b)	Stone Concrete	4.0	0.74	3.0
		c)	Concrete Block	3.8	0.82	3.1
C.	Madongan River Improvement			215.3	*0.77*	166.7
	(1) Earth Dike	a)	Site Clearing	0.8	0.82	0.7
		b)	Embankment (incl. Hauling)	16.6	0.84	14.0
		c)	Gravel Maintenance Road	0.6	0.84	0.5
	(2) Spur Dike	a)	Type-A	15.4	0.77	11.8
		b)	Type-B	24.6	0.77	19.0
		c)	Type-C	128.3	0.76	97.5
	(3) Intake Sluiceway	a)	Type-A	2.7	0.82	2.2
		b)	Type-B	9.0	0.82	7.4
	(4) Groundsill	a)	Structural Excavation	0.4	0.85	0.3
		b)	Stone Concrete	6.0	0.74	4.5
		c)	Concrete Block	10.8	0.82	8.8
D.	Papa River Improvement			146.7	*0.77*	112.5
	(1) Earth Dike	a)	Site Clearing	0.1	0.82	0.0
		b)	Embankment (incl. Hauling)	3.5	0.84	2.9
		c)	Gravel Maintenance Road	0.3	0.84	0.2
	(2) Spur Dike	a)	Type-A	6.0	0.77	4.6
		b)	Type-B	23.9	0.77	18.4
		c)	Type-D	101.6	0.76	77.2
	(3) Intake Sluiceway (Type-A)			1.8	0.82	1.5
	(4) Groundsill	a)	Structural Excavation	0.2	0.85	0.2
		b)	Stone Concrete	3.6	0.74	2.7
		c)	Concrete Block	5.8	0.82	4.7
	Total			836.7	*0.79*	658.1

Note *1 Refer to Table E.1.12.

*2 Italic figures of the conversion factors are calculated as a comprehensive factor based on the results of work types.

Table E.2.12(3) Financial and Economic Costs of Objective Project

(3) Laoag-Bongo River Improvement

	Work Item	Financial Costs (Mil. Pesos)	Conversion Factor *1	Economic Costs (Mil. Pesos)
A.	Poblacion Laoag River Improvement	33.7	*0.82*	27.6
	(1) Earth Dike	19.0		15.9
	a) Site Clearing	2.6	0.82	2.2
	b) Embankment	16.0	0.84	13.4
	c) Gravel Maintenance Road	0.4	0.81	0.3
	(2) River Wall	12.1		9.6
	a) Concrete Sheet Piling	2.2	0.81	1.7
	b) Embankment	0.8	0.84	0.7
	c) Footing Concrete	0.8	0.83	0.7
	d) Gravel Base	0.7	0.76	0.6
	e) Grouted Stone Pitching	2.9	0.76	2.2
	f) R.C. Wall	4.6	0.81	3.8
	(3) Drainage Sluiceway	2.6	0.80	2.1
B.	Poblacion San Nicolas River Improvement	38.9	*0.83*	32.3
	(1) Earth Dike	34.7		29.0
	a) Site Clearing	4.9	0.82	4.0
	b) Embankment	29.1	0.84	24.4
	c) Gravel Maintenance Road	0.7	0.81	0.6
	(2) Spur Dike (5 units)	1.6	0.75	1.2
	(3) Drainage Sluiceway	2.6	0.80	2.1
C.	Poblacion Dingras River Improvement	60.7	*0.83*	50.2
	(1) Earth Dike	48.6		40.6
	a) Site Clearing	7.5	0.82	6.1
	b) Embankment	40.2	0.84	33.8
	c) Gravel Maintenance Road	0.9	0.81	0.7
	(2) River Wall	9.2		7.3
	a) Concrete Sheet Piling	4.1	0.81	3.3
	b) Embankment	0.5	0.84	0.4
	c) Footing Concrete	0.4	0.83	0.3
	d) Gravel Base	0.5	0.76	0.4
	e) Grouted Stone Pitching	2.5	0.76	1.9
	f) R.C. Wall	1.4	0.81	1.1
	(3) Spur Dike (5 units)	1.6	0.75	1.2
	(4) Drainage Sluiceway	1.3	0.80	1.0
	Total	133.3	*0.83*	110.2

Note *1 Refer to Table E.1.12.
*2 Italic figures of the conversion factors are calculated as a comprehensive factor based on the results of work types.

Table E.2.13 Financial and Economic Costs, and Conversion Factors by Major Schemes

Work Item	Financial Costs (Mil. Pesos)	Conversion Factor	Economic Costs (Mil. Pesos)
1. Main Construction Works	1,454.6	*0.79*	1,149.5
1.1 Preparatory Works (10% of 1.2 &1.3)	132.2		104.5
1.2 Main Works	1,202.1	*0.79*	950.0
1.2.1 Sabo Dams	232.1	*0.78*	181.8
(1) Cura Sabo Dam No.1	46.0		36.0
(2) Labugaon Sabo Dam No.1	55.8		43.7
(3) Solsona Sabo Dam No.1	17.7		13.9
(4) Madongan Sabo Dam	61.7		48.3
(5) Papa Sabo Dam	50.9		39.8
1.2.2 Alluvial Fan River Improvement	836.7	*0.79*	658.1
(1) Cura/Labugaon River Improvement	300.7		243.4
(2) Solsona River Improvement	174.0		135.4
(3) Madongan River Improvement	215.3		166.7
(4) Papa River Improvement	146.7		112.5
1.2.3 Laoag-Bongo River Improvement	133.3	*0.83*	110.2
(1) Poblacion Laoag River Improvement	33.7		27.6
(2) Poblacion San Nicolas River Improveme	38.9		32.3
(3) Poblacion Dingras River Improvement	60.7		50.2
1.3 Miscellaneous Works (10% of 1.2)	120.2		95.0
2. Compensation Cost	6.4		0.4
2.1 Land Acquisition	5.9	0.00	0.0
2.2 House Resettlement	0.5		0.4
2.2.1 Laoag-Bongo River Improvement*2	0.5	0.83	0.4
3. Administration Cost (3% of 1 and 2) *3	43.8	0.95	41.6
4. Engineering Services Cost (16% of 1) *4	232.7	1.10	256.0
5. Physical Contingency (10% of 1, 2, 3 and 4)	173.7	*0.83*	144.7
Total	1,911.2	*0.83*	1,592.2

Note: * Italic figures of the conversion factors are calculated as a comprehensive factor based on the results of work types.
*2 Applied the conversion factor of a housing unit.
*3 Refer to the conversion factor in Table E.2.3.
*4 Refer to the conversion factor in the case of including both local and foreign portions in Table E.

Table E.2.14 Annual Disbursement Schedule of Objective Project

Financial Cost

Work Item	Total	1999	2000	2001	2002	2003
1. Main Construction Cost	1,454.6	0.0	375.2	377.3	370.4	331.6
1.1 Preparatory Work	132.2	0.0	34.1	34.3	33.7	30.1
1.2 Main Works	1,202.1	0.0	310.1	311.9	306.2	274.0
1.2.1 Sabo Dams and Alluvial Fan R/I	1,068.8	0.0	276.4	272.9	265.7	253.8
(1) Cura/Labugaon River	402.5	0.0	94.5	106.3	106.3	95.3
a) Cura Sabo Dam No.1	46.0	0.0	11.5	11.5	11.5	11.5
b) Labugaon Dam No.1	55.8	0.0	13.9	13.9	13.9	13.9
c) Cura/Labugaon R/I	300.7	0.0	69.0	80.9	80.9	69.9
(2) Solsona River	191.8	0.0	55.6	50.1	43.0	43.0
a) Solsona Sabo Dam No.1	17.7	0.0	10.6	7.1	0.0	0.0
b) Solsona R/I	174.0	0.0	44.9	43.0	43.0	43.0
(3) Madongan River	277.0	0.0	74.2	67.7	67.6	67.6
a) Madongan Sabo Dam No.1	61.7	0.0	15.4	15.4	15.4	15.4
b) Madongan R/I	215.3	0.0	58.7	52.3	52.2	52.2
(4) Papa River	197.5	0.0	52.2	48.7	48.7	47.8
a) Papa Sabo Dam No.1	50.9	0.0	12.7	12.7	12.7	12.7
b) Papa R/I	146.7	0.0	39.5	36.0	36.0	35.1
1.2.2 Laoag-Bongo River Improvement	133.3	0.0	33.7	38.9	40.5	20.2
(1) Poblacion of Laoag R/I	33.7	0.0	33.7	0.0	0.0	0.0
(2) Poblacion of San Nicolas R/I	38.9	0.0	0.0	38.9	0.0	0.0
(3) Poblacion of Dingras R/I	60.7	0.0	0.0	0.0	40.5	20.2
1.3 Miscellaneous Works	120.2	0.0	31.0	31.2	30.6	27.4
2. Compensation Cost	6.4	6.4	0.0	0.0	0.0	0.0
3. Adminstration Cost	43.8	0.2	11.3	11.3	11.1	9.9
4. Engineering Services Cost	232.7	87.3	36.5	36.3	36.3	36.3
5. Physical Contingency	173.8	9.4	42.3	42.5	41.8	37.8
Total	1,911.3	103.3	465.3	467.5	459.7	415.6
6. Price Contingency	421.7	5.9	68.7	93.7	119.0	134.4
Grand Total	2,333.1	109.2	534.0	561.2	578.6	550.0

Economic Cost

Work Item	Total	1999	2000	2001	2002	2003
1. Main Construction Cost	1,149.5	0.0	295.9	298.8	293.3	261.5
1.1 Preparatory Work	104.5	0.0	26.9	27.2	26.7	23.8
1.2 Main Works	950.0	0.0	244.5	246.9	242.4	216.1
1.2.1 Sabo Dams and Alluvial Fan R/I	839.8	0.0	216.9	214.6	208.9	199.4
(1) Cura/Labugaon River	323.2	0.0	75.8	85.4	85.4	76.5
a) Cura Sabo Dam No.1	36.0	0.0	9.0	9.0	9.0	9.0
b) Labugaon Dam No.1	43.7	0.0	10.9	10.9	10.9	10.9
c) Cura/Labugaon R/I	243.4	0.0	55.9	65.5	65.5	56.6
(2) Solsona River	149.3	0.0	43.3	39.1	33.5	33.5
a) Solsona Sabo Dam No.1	13.9	0.0	8.3	5.6	0.0	0.0
b) Solsona R/I	135.4	0.0	35.0	33.5	33.5	33.5
(3) Madongan River	215.0	0.0	57.5	52.5	52.5	52.5
a) Madongan Sabo Dam No.1	48.3	0.0	12.1	12.1	12.1	12.1
b) Madongan R/I	166.7	0.0	45.5	40.5	40.4	40.4
(4) Papa River	152.3	0.0	40.2	37.6	37.6	36.9
a) Papa Sabo Dam No.1	39.8	0.0	10.0	10.0	10.0	10.0
b) Papa R/I	112.5	0.0	30.3	27.6	27.6	26.9
1.2.2 Laoag-Bongo River Improvement	110.2	0.0	27.6	32.3	33.5	16.7
(1) Poblacion of Laoag R/I	27.6	0.0	27.6	0.0	0.0	0.0
(2) Poblacion of San Nicolas R/I	32.3	0.0	0.0	32.3	0.0	0.0
(3) Poblacion of Dingras R/I	50.2	0.0	0.0	0.0	33.5	16.7
1.3 Miscellaneous Works	95.0	0.0	24.5	24.7	24.2	21.6
2. Compensation Cost	0.4	0.4	0.0	0.0	0.0	0.0
3. Adminstration Cost	41.6	0.2	10.7	10.8	10.6	9.4
4. Engineering Services Cost	256.0	96.0	40.2	39.9	39.9	39.9
5. Physical Contingency	144.7	7.8	35.2	35.4	34.8	31.5
Total	1,592.2	104.4	382.0	384.9	378.6	342.3

Table E.2.15 Economic Cost and Benefit Stream of Objective Project under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	104.38		104.38					0.00	-104.38
2	2000	382.00		382.00				0.04	-0.04	-382.04
3	2001	384.90	1.18	386.07	31.56			0.04	31.52	-354.55
4	2002	378.63	2.38	381.01	71.86			0.04	71.82	-309.19
5	2003	342.34	3.59	345.94	129.34			0.04	129.30	-216.64
6	2004		4.65	4.65	203.77	2.91	1.05	0.04	207.68	203.04
7	2005		4.65	4.65	203.77	5.82	2.10	0.04	211.64	206.99
8	2006		4.65	4.65	203.77	8.73	3.14	0.04	215.60	210.95
9	2007		4.65	4.65	203.77	11.64	4.19	0.04	219.56	214.91
10	2008		4.65	4.65	203.77	14.54	5.24	0.04	223.51	218.87
11	2009		4.65	4.65	203.77	17.45	5.24	0.04	226.42	221.77
12	2010		4.65	4.65	203.77	20.36	5.24	0.04	229.33	224.68
13	2011		4.65	4.65	203.77	23.27	5.24	0.04	232.24	227.59
14	2012		4.65	4.65	194.05	26.18	5.24	0.04	225.43	220.78
15	2013		4.65	4.65	194.05	29.09	5.24	0.04	228.34	223.69
16	2014		4.65	4.65	171.09	32.00	5.24	0.04	208.29	203.64
17	2015		4.65	4.65	171.09	34.91	5.24	0.04	211.20	206.55
18	2016		4.65	4.65	171.09	37.82	5.24	0.04	214.11	209.46
19	2017		4.65	4.65	171.09	40.72	5.24	0.04	217.02	212.37
20	2018		4.65	4.65	171.09	43.63	5.24	0.04	219.93	215.28
21	2019		4.65	4.65	171.09	46.54	5.24	0.04	222.84	218.19
22	2020		4.65	4.65	171.09	49.45	5.24	0.04	225.75	221.10
23	2021		4.65	4.65	171.09	49.45	5.24	0.04	225.75	221.10
24	2022		4.65	4.65	171.09	49.45	5.24	0.04	225.75	221.10
25	2023		4.65	4.65	171.09	49.45	5.24	0.04	225.75	221.10
26	2024		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
27	2025		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
28	2026		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
29	2027		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
30	2028		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
31	2029		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
32	2030		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
33	2031		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
34	2032		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
35	2033		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
36	2034		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
37	2035		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
38	2036		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
39	2037		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
40	2038		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
41	2039		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
42	2040		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
43	2041		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
44	2042		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
45	2043		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
46	2044		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
47	2045		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
48	2046		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
49	2047		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
50	2048		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
51	2049		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
52	2050		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
53	2051		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
54	2052		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14
55	2053		4.65	4.65	155.13	49.45	5.24	0.04	209.78	205.14

NPV: -190.2 B/C: 0.82 EIRR : 12.4%

Table E.2.16(1) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Poblacion of Laoag under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit			Balance
		Construction	O&M	Total	Flood Control	Negative	Total	
1	1999	3.02		3.02			0.00	-3.02
2	2000	43.14		43.14		0.00	0.00	-43.14
3	2001	0.00	0.17	0.17	14.38	0.00	14.38	14.21
4	2002	0.00	0.17	0.17	14.38	0.00	14.38	14.21
5	2003	0.00	0.17	0.17	14.38	0.00	14.38	14.21
6	2004		0.17	0.17	14.38	0.00	14.38	14.21
7	2005		0.17	0.17	14.38	0.00	14.38	14.21
8	2006		0.17	0.17	14.38	0.00	14.38	14.21
9	2007		0.17	0.17	14.38	0.00	14.38	14.21
10	2008		0.17	0.17	14.38	0.00	14.38	14.21
11	2009		0.17	0.17	14.38	0.00	14.38	14.21
12	2010		0.17	0.17	14.38	0.00	14.38	14.21
13	2011		0.17	0.17	14.38	0.00	14.38	14.21
14	2012		0.17	0.17	14.38	0.00	14.38	14.21
15	2013		0.17	0.17	14.38	0.00	14.38	14.21
16	2014		0.17	0.17	14.38	0.00	14.38	14.21
17	2015		0.17	0.17	14.38	0.00	14.38	14.21
18	2016		0.17	0.17	14.38	0.00	14.38	14.21
19	2017		0.17	0.17	14.38	0.00	14.38	14.21
20	2018		0.17	0.17	14.38	0.00	14.38	14.21
21	2019		0.17	0.17	14.38	0.00	14.38	14.21
22	2020		0.17	0.17	14.38	0.00	14.38	14.21
23	2021		0.17	0.17	14.38	0.00	14.38	14.21
24	2022		0.17	0.17	14.38	0.00	14.38	14.21
25	2023		0.17	0.17	14.38	0.00	14.38	14.21
26	2024		0.17	0.17	14.38	0.00	14.38	14.21
27	2025		0.17	0.17	14.38	0.00	14.38	14.21
28	2026		0.17	0.17	14.38	0.00	14.38	14.21
29	2027		0.17	0.17	14.38	0.00	14.38	14.21
30	2028		0.17	0.17	14.38	0.00	14.38	14.21
31	2029		0.17	0.17	14.38	0.00	14.38	14.21
32	2030		0.17	0.17	14.38	0.00	14.38	14.21
33	2031		0.17	0.17	14.38	0.00	14.38	14.21
34	2032		0.17	0.17	14.38	0.00	14.38	14.21
35	2033		0.17	0.17	14.38	0.00	14.38	14.21
36	2034		0.17	0.17	14.38	0.00	14.38	14.21
37	2035		0.17	0.17	14.38	0.00	14.38	14.21
38	2036		0.17	0.17	14.38	0.00	14.38	14.21
39	2037		0.17	0.17	14.38	0.00	14.38	14.21
40	2038		0.17	0.17	14.38	0.00	14.38	14.21
41	2039		0.17	0.17	14.38	0.00	14.38	14.21
42	2040		0.17	0.17	14.38	0.00	14.38	14.21
43	2041		0.17	0.17	14.38	0.00	14.38	14.21
44	2042		0.17	0.17	14.38	0.00	14.38	14.21
45	2043		0.17	0.17	14.38	0.00	14.38	14.21
46	2044		0.17	0.17	14.38	0.00	14.38	14.21
47	2045		0.17	0.17	14.38	0.00	14.38	14.21
48	2046		0.17	0.17	14.38	0.00	14.38	14.21
49	2047		0.17	0.17	14.38	0.00	14.38	14.21
50	2048		0.17	0.17	14.38	0.00	14.38	14.21
51	2049		0.17	0.17	14.38	0.00	14.38	14.21
52	2050		0.17	0.17	14.38	0.00	14.38	14.21
53	2051		0.17	0.17	14.38	0.00	14.38	14.21
54	2052		0.17	0.17	14.38	0.00	14.38	14.21
55	2053		0.17	0.17	14.38	0.00	14.38	14.21

NPV: 36.3 B/C: 2.01 EIRR : 30.2%

Table E.2.16(2) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Poblacion of San Nicolas under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit			Balance
		Construction	O&M	Total	Flood Control	Negative	Total	
1	1999	3.54		3.54			0.00	-3.54
2	2000	0.00		0.00		0.01	-0.01	-0.01
3	2001	50.40		50.40		0.01	-0.01	-50.42
4	2002	0.00	0.20	0.20	3.55	0.01	3.54	3.34
5	2003	0.00	0.20	0.20	3.55	0.01	3.54	3.34
6	2004		0.20	0.20	3.55	0.01	3.54	3.34
7	2005		0.20	0.20	3.55	0.01	3.54	3.34
8	2006		0.20	0.20	3.55	0.01	3.54	3.34
9	2007		0.20	0.20	3.55	0.01	3.54	3.34
10	2008		0.20	0.20	3.55	0.01	3.54	3.34
11	2009		0.20	0.20	3.55	0.01	3.54	3.34
12	2010		0.20	0.20	3.55	0.01	3.54	3.34
13	2011		0.20	0.20	3.55	0.01	3.54	3.34
14	2012		0.20	0.20	3.55	0.01	3.54	3.34
15	2013		0.20	0.20	3.55	0.01	3.54	3.34
16	2014		0.20	0.20	3.55	0.01	3.54	3.34
17	2015		0.20	0.20	3.55	0.01	3.54	3.34
18	2016		0.20	0.20	3.55	0.01	3.54	3.34
19	2017		0.20	0.20	3.55	0.01	3.54	3.34
20	2018		0.20	0.20	3.55	0.01	3.54	3.34
21	2019		0.20	0.20	3.55	0.01	3.54	3.34
22	2020		0.20	0.20	3.55	0.01	3.54	3.34
23	2021		0.20	0.20	3.55	0.01	3.54	3.34
24	2022		0.20	0.20	3.55	0.01	3.54	3.34
25	2023		0.20	0.20	3.55	0.01	3.54	3.34
26	2024		0.20	0.20	3.55	0.01	3.54	3.34
27	2025		0.20	0.20	3.55	0.01	3.54	3.34
28	2026		0.20	0.20	3.55	0.01	3.54	3.34
29	2027		0.20	0.20	3.55	0.01	3.54	3.34
30	2028		0.20	0.20	3.55	0.01	3.54	3.34
31	2029		0.20	0.20	3.55	0.01	3.54	3.34
32	2030		0.20	0.20	3.55	0.01	3.54	3.34
33	2031		0.20	0.20	3.55	0.01	3.54	3.34
34	2032		0.20	0.20	3.55	0.01	3.54	3.34
35	2033		0.20	0.20	3.55	0.01	3.54	3.34
36	2034		0.20	0.20	3.55	0.01	3.54	3.34
37	2035		0.20	0.20	3.55	0.01	3.54	3.34
38	2036		0.20	0.20	3.55	0.01	3.54	3.34
39	2037		0.20	0.20	3.55	0.01	3.54	3.34
40	2038		0.20	0.20	3.55	0.01	3.54	3.34
41	2039		0.20	0.20	3.55	0.01	3.54	3.34
42	2040		0.20	0.20	3.55	0.01	3.54	3.34
43	2041		0.20	0.20	3.55	0.01	3.54	3.34
44	2042		0.20	0.20	3.55	0.01	3.54	3.34
45	2043		0.20	0.20	3.55	0.01	3.54	3.34
46	2044		0.20	0.20	3.55	0.01	3.54	3.34
47	2045		0.20	0.20	3.55	0.01	3.54	3.34
48	2046		0.20	0.20	3.55	0.01	3.54	3.34
49	2047		0.20	0.20	3.55	0.01	3.54	3.34
50	2048		0.20	0.20	3.55	0.01	3.54	3.34
51	2049		0.20	0.20	3.55	0.01	3.54	3.34
52	2050		0.20	0.20	3.55	0.01	3.54	3.34
53	2051		0.20	0.20	3.55	0.01	3.54	3.34
54	2052		0.20	0.20	3.55	0.01	3.54	3.34
55	2053		0.20	0.20	3.55	0.01	3.54	3.34

NPV: -21.6 B/C: 0.42 EIRR : 5.8%

Table E.2.16(3) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Poblacion of Dingras under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit			Balance
		Construction	O&M	Total	Flood Control	Negative	Total	
1	1999	5.90		5.90			0.00	-5.90
2	2000	0.00		0.00		0.02	-0.02	-0.02
3	2001	0.00		0.00		0.02	-0.02	-0.02
4	2002	52.29		52.29		0.02	-0.02	-52.32
5	2003	26.52	0.20	26.72	2.56	0.02	2.54	-24.19
6	2004		0.30	0.30	5.42	0.02	5.40	5.09
7	2005		0.30	0.30	5.42	0.02	5.40	5.09
8	2006		0.30	0.30	5.42	0.02	5.40	5.09
9	2007		0.30	0.30	5.42	0.02	5.40	5.09
10	2008		0.30	0.30	5.42	0.02	5.40	5.09
11	2009		0.30	0.30	5.42	0.02	5.40	5.09
12	2010		0.30	0.30	5.42	0.02	5.40	5.09
13	2011		0.30	0.30	5.42	0.02	5.40	5.09
14	2012		0.30	0.30	5.42	0.02	5.40	5.09
15	2013		0.30	0.30	5.42	0.02	5.40	5.09
16	2014		0.30	0.30	5.42	0.02	5.40	5.09
17	2015		0.30	0.30	5.42	0.02	5.40	5.09
18	2016		0.30	0.30	5.42	0.02	5.40	5.09
19	2017		0.30	0.30	5.42	0.02	5.40	5.09
20	2018		0.30	0.30	5.42	0.02	5.40	5.09
21	2019		0.30	0.30	5.42	0.02	5.40	5.09
22	2020		0.30	0.30	5.42	0.02	5.40	5.09
23	2021		0.30	0.30	5.42	0.02	5.40	5.09
24	2022		0.30	0.30	5.42	0.02	5.40	5.09
25	2023		0.30	0.30	5.42	0.02	5.40	5.09
26	2024		0.30	0.30	5.42	0.02	5.40	5.09
27	2025		0.30	0.30	5.42	0.02	5.40	5.09
28	2026		0.30	0.30	5.42	0.02	5.40	5.09
29	2027		0.30	0.30	5.42	0.02	5.40	5.09
30	2028		0.30	0.30	5.42	0.02	5.40	5.09
31	2029		0.30	0.30	5.42	0.02	5.40	5.09
32	2030		0.30	0.30	5.42	0.02	5.40	5.09
33	2031		0.30	0.30	5.42	0.02	5.40	5.09
34	2032		0.30	0.30	5.42	0.02	5.40	5.09
35	2033		0.30	0.30	5.42	0.02	5.40	5.09
36	2034		0.30	0.30	5.42	0.02	5.40	5.09
37	2035		0.30	0.30	5.42	0.02	5.40	5.09
38	2036		0.30	0.30	5.42	0.02	5.40	5.09
39	2037		0.30	0.30	5.42	0.02	5.40	5.09
40	2038		0.30	0.30	5.42	0.02	5.40	5.09
41	2039		0.30	0.30	5.42	0.02	5.40	5.09
42	2040		0.30	0.30	5.42	0.02	5.40	5.09
43	2041		0.30	0.30	5.42	0.02	5.40	5.09
44	2042		0.30	0.30	5.42	0.02	5.40	5.09
45	2043		0.30	0.30	5.42	0.02	5.40	5.09
46	2044		0.30	0.30	5.42	0.02	5.40	5.09
47	2045		0.30	0.30	5.42	0.02	5.40	5.09
48	2046		0.30	0.30	5.42	0.02	5.40	5.09
49	2047		0.30	0.30	5.42	0.02	5.40	5.09
50	2048		0.30	0.30	5.42	0.02	5.40	5.09
51	2049		0.30	0.30	5.42	0.02	5.40	5.09
52	2050		0.30	0.30	5.42	0.02	5.40	5.09
53	2051		0.30	0.30	5.42	0.02	5.40	5.09
54	2052		0.30	0.30	5.42	0.02	5.40	5.09
55	2053		0.30	0.30	5.42	0.02	5.40	5.09

NPV: -30.2 B/C: 0.39 EIRR : 5.5%

Table E.2.16(4) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Cura River Basin under Present Condition

(Unit : Million Pesos)

Serial	Year	Cost			Benefit					Balance
Year		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	35.38		35.38					0.00	-35.38
2	2000	118.44		118.44				0.00	-0.00	-118.44
3	2001	133.15	0.34	133.49	5.51			0.00	5.51	-127.98
4	2002	133.43	0.73	134.16	19.17			0.00	19.17	-114.99
5	2003	121.25	1.13	122.38	41.14			0.00	41.14	-81.24
6	2004		1.47	1.47	68.29	1.65	0.44	0.00	70.38	68.91
7	2005		1.47	1.47	68.29	3.30	0.88	0.00	72.47	70.99
8	2006		1.47	1.47	68.29	4.95	1.31	0.00	74.56	73.08
9	2007		1.47	1.47	68.29	6.60	1.75	0.00	76.64	75.17
10	2008		1.47	1.47	68.29	8.25	2.19	0.00	78.73	77.26
11	2009		1.47	1.47	68.29	9.90	2.19	0.00	80.38	78.91
12	2010		1.47	1.47	68.29	11.55	2.19	0.00	82.03	80.56
13	2011		1.47	1.47	68.29	13.20	2.19	0.00	83.68	82.21
14	2012		1.47	1.47	68.29	14.85	2.19	0.00	85.33	83.86
15	2013		1.47	1.47	68.29	16.50	2.19	0.00	86.98	85.51
16	2014		1.47	1.47	45.34	18.15	2.19	0.00	65.68	64.20
17	2015		1.47	1.47	45.34	19.80	2.19	0.00	67.33	65.85
18	2016		1.47	1.47	45.34	21.46	2.19	0.00	68.98	67.51
19	2017		1.47	1.47	45.34	23.11	2.19	0.00	70.63	69.16
20	2018		1.47	1.47	45.34	24.76	2.19	0.00	72.28	70.81
21	2019		1.47	1.47	45.34	26.41	2.19	0.00	73.93	72.46
22	2020		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
23	2021		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
24	2022		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
25	2023		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
26	2024		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
27	2025		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
28	2026		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
29	2027		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
30	2028		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
31	2029		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
32	2030		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
33	2031		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
34	2032		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
35	2033		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
36	2034		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
37	2035		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
38	2036		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
39	2037		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
40	2038		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
41	2039		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
42	2040		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
43	2041		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
44	2042		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
45	2043		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
46	2044		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
47	2045		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
48	2046		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
49	2047		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
50	2048		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
51	2049		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
52	2050		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
53	2051		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
54	2052		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11
55	2053		1.47	1.47	45.34	28.06	2.19	0.00	75.58	74.11

NPV: -64.5 B/C: 0.82 EIRR : 12.4%

Table E.2.16(5) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Solsona River Basin under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	16.34		16.34					0.00	-16.34
2	2000	67.66		67.66				0.00	-0.00	-67.66
3	2001	60.87	0.21	61.08	5.00			0.00	5.00	-56.09
4	2002	52.28	0.41	52.69	14.86			0.00	14.86	-37.83
5	2003	53.03	0.62	53.65	27.53			0.00	27.53	-26.12
6	2004		0.82	0.82	44.33	0.68	0.10	0.00	45.10	44.28
7	2005		0.82	0.82	44.33	1.35	0.20	0.00	45.88	45.06
8	2006		0.82	0.82	44.33	2.03	0.31	0.00	46.66	45.84
9	2007		0.82	0.82	44.33	2.70	0.41	0.00	47.44	46.62
10	2008		0.82	0.82	44.33	3.38	0.51	0.00	48.21	47.39
11	2009		0.82	0.82	44.33	4.05	0.51	0.00	48.89	48.07
12	2010		0.82	0.82	44.33	4.73	0.51	0.00	49.56	48.74
13	2011		0.82	0.82	44.33	5.40	0.51	0.00	50.24	49.42
14	2012		0.82	0.82	34.61	6.08	0.51	0.00	41.19	40.37
15	2013		0.82	0.82	34.61	6.75	0.51	0.00	41.87	41.05
16	2014		0.82	0.82	34.61	7.43	0.51	0.00	42.54	41.72
17	2015		0.82	0.82	34.61	8.10	0.51	0.00	43.22	42.40
18	2016		0.82	0.82	34.61	8.78	0.51	0.00	43.89	43.07
19	2017		0.82	0.82	34.61	9.45	0.51	0.00	44.57	43.75
20	2018		0.82	0.82	34.61	10.13	0.51	0.00	45.24	44.42
21	2019		0.82	0.82	34.61	10.80	0.51	0.00	45.92	45.10
22	2020		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
23	2021		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
24	2022		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
25	2023		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
26	2024		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
27	2025		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
28	2026		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
29	2027		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
30	2028		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
31	2029		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
32	2030		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
33	2031		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
34	2032		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
35	2033		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
36	2034		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
37	2035		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
38	2036		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
39	2037		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
40	2038		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
41	2039		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
42	2040		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
43	2041		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
44	2042		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
45	2043		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
46	2044		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
47	2045		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
48	2046		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
49	2047		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
50	2048		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
51	2049		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
52	2050		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
53	2051		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
54	2052		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77
55	2053		0.82	0.82	34.61	11.48	0.51	0.00	46.59	45.77

NPV: 13.5 B/C: 1.08 EIRR : 16.1%

Table E.2.16(6) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Madongan River Basin under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	23.53		23.53					0.00	-23.53
2	2000	89.90		89.90				0.00	0.00	-89.90
3	2001	81.90	0.28	82.17	4.74			0.00	4.74	-77.43
4	2002	81.93	0.52	82.45	14.05			0.00	14.05	-68.40
5	2003	83.10	0.76	83.86	28.31			0.00	28.31	-55.55
6	2004		1.01	1.01	47.82	0.40	0.50	0.00	48.73	47.72
7	2005		1.01	1.01	47.82	0.81	1.01	0.00	49.63	48.62
8	2006		1.01	1.01	47.82	1.21	1.51	0.00	50.54	49.53
9	2007		1.01	1.01	47.82	1.62	2.01	0.00	51.45	50.44
10	2008		1.01	1.01	47.82	2.02	2.51	0.00	52.36	51.35
11	2009		1.01	1.01	47.82	2.43	2.51	0.00	52.76	51.75
12	2010		1.01	1.01	47.82	2.83	2.51	0.00	53.17	52.16
13	2011		1.01	1.01	47.82	3.24	2.51	0.00	53.57	52.56
14	2012		1.01	1.01	47.82	3.64	2.51	0.00	53.98	52.97
15	2013		1.01	1.01	47.82	4.05	2.51	0.00	54.38	53.37
16	2014		1.01	1.01	47.82	4.45	2.51	0.00	54.79	53.78
17	2015		1.01	1.01	47.82	4.86	2.51	0.00	55.19	54.18
18	2016		1.01	1.01	47.82	5.26	2.51	0.00	55.59	54.59
19	2017		1.01	1.01	47.82	5.67	2.51	0.00	56.00	54.99
20	2018		1.01	1.01	47.82	6.07	2.51	0.00	56.40	55.40
21	2019		1.01	1.01	47.82	6.48	2.51	0.00	56.81	55.80
22	2020		1.01	1.01	47.82	6.88	2.51	0.00	57.21	56.21
23	2021		1.01	1.01	47.82	6.88	2.51	0.00	57.21	56.21
24	2022		1.01	1.01	47.82	6.88	2.51	0.00	57.21	56.21
25	2023		1.01	1.01	47.82	6.88	2.51	0.00	57.21	56.21
26	2024		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
27	2025		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
28	2026		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
29	2027		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
30	2028		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
31	2029		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
32	2030		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
33	2031		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
34	2032		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
35	2033		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
36	2034		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
37	2035		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
38	2036		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
39	2037		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
40	2038		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
41	2039		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
42	2040		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
43	2041		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
44	2042		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
45	2043		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
46	2044		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
47	2045		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
48	2046		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
49	2047		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
50	2048		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
51	2049		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
52	2050		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
53	2051		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
54	2052		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47
55	2053		1.01	1.01	37.08	6.88	2.51	0.00	46.48	45.47

NPV: -37.5 B/C: 0.81 EIRR : 12.8%

Table E.2.16(7) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Papa River Basin under Present Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	16.67		16.67					0.00	-16.67
2	2000	62.85		62.85				0.00	0.00	-62.85
3	2001	58.58	0.18	58.76	1.94			0.00	1.94	-56.82
4	2002	58.70	0.35	59.05	5.85			0.00	5.85	-53.20
5	2003	58.45	0.52	58.96	11.88			0.00	11.88	-47.09
6	2004		0.68	0.68	19.98	0.18	0.01	0.00	20.17	19.49
7	2005		0.68	0.68	19.98	0.36	0.01	0.00	20.35	19.67
8	2006		0.68	0.68	19.98	0.54	0.02	0.00	20.53	19.85
9	2007		0.68	0.68	19.98	0.71	0.02	0.00	20.72	20.04
10	2008		0.68	0.68	19.98	0.89	0.03	0.00	20.90	20.22
11	2009		0.68	0.68	19.98	1.07	0.03	0.00	21.08	20.40
12	2010		0.68	0.68	19.98	1.25	0.03	0.00	21.26	20.58
13	2011		0.68	0.68	19.98	1.43	0.03	0.00	21.44	20.76
14	2012		0.68	0.68	19.98	1.61	0.03	0.00	21.62	20.94
15	2013		0.68	0.68	19.98	1.79	0.03	0.00	21.80	21.12
16	2014		0.68	0.68	19.98	1.97	0.03	0.00	21.97	21.29
17	2015		0.68	0.68	19.98	2.14	0.03	0.00	22.15	21.47
18	2016		0.68	0.68	19.98	2.32	0.03	0.00	22.33	21.65
19	2017		0.68	0.68	19.98	2.50	0.03	0.00	22.51	21.83
20	2018		0.68	0.68	19.98	2.68	0.03	0.00	22.69	22.01
21	2019		0.68	0.68	19.98	2.86	0.03	0.00	22.87	22.19
22	2020		0.68	0.68	19.98	3.04	0.03	0.00	23.05	22.37
23	2021		0.68	0.68	19.98	3.04	0.03	0.00	23.05	22.37
24	2022		0.68	0.68	19.98	3.04	0.03	0.00	23.05	22.37
25	2023		0.68	0.68	19.98	3.04	0.03	0.00	23.05	22.37
26	2024		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
27	2025		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
28	2026		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
29	2027		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
30	2028		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
31	2029		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
32	2030		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
33	2031		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
34	2032		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
35	2033		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
36	2034		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
37	2035		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
38	2036		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
39	2037		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
40	2038		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
41	2039		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
42	2040		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
43	2041		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
44	2042		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
45	2043		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
46	2044		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
47	2045		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
48	2046		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
49	2047		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
50	2048		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
51	2049		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
52	2050		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
53	2051		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
54	2052		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14
55	2053		0.68	0.68	14.76	3.04	0.03	0.00	17.82	17.14

NPV: -86.2 B/C: 0.48 EIRR : 7.2%

Table E.2.17 Economic Cost and Benefit Stream of ObjectiveProject under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	104.38		104.38					0.00	-104.38
2	2000	382.00		382.00				0.04	-0.04	-382.04
3	2001	384.90	1.18	386.07	82.10			0.04	82.05	-304.02
4	2002	378.63	2.38	381.01	143.06			0.04	143.01	-238.00
5	2003	342.34	3.59	345.94	205.67			0.04	205.62	-140.31
6	2004		4.65	4.65	280.88	3.71	1.38	0.04	285.93	281.29
7	2005		4.65	4.65	292.50	7.66	2.76	0.04	302.87	298.23
8	2006		4.65	4.65	304.59	11.84	4.27	0.04	320.66	316.01
9	2007		4.65	4.65	317.19	16.28	5.87	0.04	339.29	334.65
10	2008		4.65	4.65	330.31	20.98	7.56	0.04	358.81	354.16
11	2009		4.65	4.65	343.97	25.96	7.80	0.04	377.68	373.03
12	2010		4.65	4.65	358.20	31.22	8.04	0.04	397.41	392.77
13	2011		4.65	4.65	369.26	36.79	8.29	0.04	414.30	409.65
14	2012		4.65	4.65	362.21	42.67	8.54	0.04	413.38	408.73
15	2013		4.65	4.65	373.40	48.89	8.81	0.04	431.05	426.40
16	2014		4.65	4.65	338.83	55.44	9.08	0.05	403.31	398.66
17	2015		4.65	4.65	349.28	62.36	9.36	0.05	420.96	416.31
18	2016		4.65	4.65	360.06	69.65	9.65	0.05	439.32	434.67
19	2017		4.65	4.65	371.17	77.33	9.95	0.05	458.41	453.76
20	2018		4.65	4.65	382.62	85.42	10.26	0.05	478.26	473.61
21	2019		4.65	4.65	394.43	93.95	10.58	0.05	498.91	494.26
22	2020		4.65	4.65	406.60	102.91	10.58	0.05	520.04	515.40
23	2021		4.65	4.65	406.60	102.91	10.58	0.05	520.04	515.40
24	2022		4.65	4.65	406.60	102.91	10.58	0.05	520.04	515.40
25	2023		4.65	4.65	406.60	102.91	10.58	0.05	520.04	515.40
26	2024		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
27	2025		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
28	2026		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
29	2027		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
30	2028		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
31	2029		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
32	2030		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
33	2031		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
34	2032		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
35	2033		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
36	2034		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
37	2035		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
38	2036		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
39	2037		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
40	2038		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
41	2039		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
42	2040		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
43	2041		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
44	2042		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
45	2043		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
46	2044		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
47	2045		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
48	2046		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
49	2047		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
50	2048		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
51	2049		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
52	2050		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
53	2051		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
54	2052		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59
55	2053		4.65	4.65	369.79	102.91	10.58	0.05	483.24	478.59

NPV: 441.8 B/C: 1.43 EIRR : 20.3%

Table E.2.18(1) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Poblacion of Laoag under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit			Balance
		Construction	O&M	Total	Flood Control	Negative	Total	
1	1999	3.02		3.02			0.00	-3.02
2	2000	43.14		43.14		0.00	0.00	-43.14
3	2001	0.00	0.17	0.17	17.83	0.00	17.83	17.66
4	2002	0.00	0.17	0.17	18.61	0.00	18.61	18.44
5	2003	0.00	0.17	0.17	19.43	0.00	19.43	19.26
6	2004		0.17	0.17	20.28	0.00	20.28	20.12
7	2005		0.17	0.17	21.18	0.00	21.18	21.01
8	2006		0.17	0.17	22.11	0.00	22.11	21.94
9	2007		0.17	0.17	23.08	0.00	23.08	22.91
10	2008		0.17	0.17	24.09	0.00	24.09	23.93
11	2009		0.17	0.17	25.15	0.00	25.15	24.99
12	2010		0.17	0.17	26.26	0.00	26.26	26.09
13	2011		0.17	0.17	27.06	0.00	27.06	26.89
14	2012		0.17	0.17	27.89	0.00	27.89	27.72
15	2013		0.17	0.17	28.74	0.00	28.74	28.57
16	2014		0.17	0.17	29.61	0.00	29.61	29.44
17	2015		0.17	0.17	30.51	0.00	30.51	30.35
18	2016		0.17	0.17	31.44	0.00	31.44	31.28
19	2017		0.17	0.17	32.40	0.00	32.40	32.24
20	2018		0.17	0.17	33.39	0.00	33.39	33.22
21	2019		0.17	0.17	34.41	0.00	34.41	34.24
22	2020		0.17	0.17	35.46	0.00	35.46	35.29
23	2021		0.17	0.17	35.46	0.00	35.46	35.29
24	2022		0.17	0.17	35.46	0.00	35.46	35.29
25	2023		0.17	0.17	35.46	0.00	35.46	35.29
26	2024		0.17	0.17	35.46	0.00	35.46	35.29
27	2025		0.17	0.17	35.46	0.00	35.46	35.29
28	2026		0.17	0.17	35.46	0.00	35.46	35.29
29	2027		0.17	0.17	35.46	0.00	35.46	35.29
30	2028		0.17	0.17	35.46	0.00	35.46	35.29
31	2029		0.17	0.17	35.46	0.00	35.46	35.29
32	2030		0.17	0.17	35.46	0.00	35.46	35.29
33	2031		0.17	0.17	35.46	0.00	35.46	35.29
34	2032		0.17	0.17	35.46	0.00	35.46	35.29
35	2033		0.17	0.17	35.46	0.00	35.46	35.29
36	2034		0.17	0.17	35.46	0.00	35.46	35.29
37	2035		0.17	0.17	35.46	0.00	35.46	35.29
38	2036		0.17	0.17	35.46	0.00	35.46	35.29
39	2037		0.17	0.17	35.46	0.00	35.46	35.29
40	2038		0.17	0.17	35.46	0.00	35.46	35.29
41	2039		0.17	0.17	35.46	0.00	35.46	35.29
42	2040		0.17	0.17	35.46	0.00	35.46	35.29
43	2041		0.17	0.17	35.46	0.00	35.46	35.29
44	2042		0.17	0.17	35.46	0.00	35.46	35.29
45	2043		0.17	0.17	35.46	0.00	35.46	35.29
46	2044		0.17	0.17	35.46	0.00	35.46	35.29
47	2045		0.17	0.17	35.46	0.00	35.46	35.29
48	2046		0.17	0.17	35.46	0.00	35.46	35.29
49	2047		0.17	0.17	35.46	0.00	35.46	35.29
50	2048		0.17	0.17	35.46	0.00	35.46	35.29
51	2049		0.17	0.17	35.46	0.00	35.46	35.29
52	2050		0.17	0.17	35.46	0.00	35.46	35.29
53	2051		0.17	0.17	35.46	0.00	35.46	35.29
54	2052		0.17	0.17	35.46	0.00	35.46	35.29
55	2053		0.17	0.17	35.46	0.00	35.46	35.29

NPV: 81.7 B/C: 3.26 EIRR : 41.6%

Table E.2.18(2) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Poblacion of San Nicolas under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit			Balance
		Construction	O&M	Total	Flood Control	Negative	Total	
1	1999	3.54		3.54			0.00	-3.54
2	2000	0.00		0.00		0.02	-0.02	-0.02
3	2001	50.40		50.40		0.02	-0.02	-50.42
4	2002	0.00	0.20	0.20	4.52	0.02	4.50	4.31
5	2003	0.00	0.20	0.20	4.70	0.02	4.69	4.49
6	2004		0.20	0.20	4.89	0.02	4.88	4.68
7	2005		0.20	0.20	5.09	0.02	5.08	4.88
8	2006		0.20	0.20	5.30	0.02	5.28	5.09
9	2007		0.20	0.20	5.52	0.02	5.50	5.30
10	2008		0.20	0.20	5.74	0.02	5.72	5.53
11	2009		0.20	0.20	5.98	0.02	5.96	5.76
12	2010		0.20	0.20	6.22	0.02	6.20	6.00
13	2011		0.20	0.20	6.41	0.02	6.38	6.19
14	2012		0.20	0.20	6.60	0.02	6.58	6.38
15	2013		0.20	0.20	6.80	0.02	6.77	6.58
16	2014		0.20	0.20	7.00	0.02	6.97	6.78
17	2015		0.20	0.20	7.21	0.03	7.18	6.99
18	2016		0.20	0.20	7.42	0.03	7.40	7.20
19	2017		0.20	0.20	7.64	0.03	7.62	7.42
20	2018		0.20	0.20	7.87	0.03	7.84	7.65
21	2019		0.20	0.20	8.11	0.03	8.08	7.88
22	2020		0.20	0.20	8.35	0.03	8.32	8.12
23	2021		0.20	0.20	8.35	0.03	8.32	8.12
24	2022		0.20	0.20	8.35	0.03	8.32	8.12
25	2023		0.20	0.20	8.35	0.03	8.32	8.12
26	2024		0.20	0.20	8.35	0.03	8.32	8.12
27	2025		0.20	0.20	8.35	0.03	8.32	8.12
28	2026		0.20	0.20	8.35	0.03	8.32	8.12
29	2027		0.20	0.20	8.35	0.03	8.32	8.12
30	2028		0.20	0.20	8.35	0.03	8.32	8.12
31	2029		0.20	0.20	8.35	0.03	8.32	8.12
32	2030		0.20	0.20	8.35	0.03	8.32	8.12
33	2031		0.20	0.20	8.35	0.03	8.32	8.12
34	2032		0.20	0.20	8.35	0.03	8.32	8.12
35	2033		0.20	0.20	8.35	0.03	8.32	8.12
36	2034		0.20	0.20	8.35	0.03	8.32	8.12
37	2035		0.20	0.20	8.35	0.03	8.32	8.12
38	2036		0.20	0.20	8.35	0.03	8.32	8.12
39	2037		0.20	0.20	8.35	0.03	8.32	8.12
40	2038		0.20	0.20	8.35	0.03	8.32	8.12
41	2039		0.20	0.20	8.35	0.03	8.32	8.12
42	2040		0.20	0.20	8.35	0.03	8.32	8.12
43	2041		0.20	0.20	8.35	0.03	8.32	8.12
44	2042		0.20	0.20	8.35	0.03	8.32	8.12
45	2043		0.20	0.20	8.35	0.03	8.32	8.12
46	2044		0.20	0.20	8.35	0.03	8.32	8.12
47	2045		0.20	0.20	8.35	0.03	8.32	8.12
48	2046		0.20	0.20	8.35	0.03	8.32	8.12
49	2047		0.20	0.20	8.35	0.03	8.32	8.12
50	2048		0.20	0.20	8.35	0.03	8.32	8.12
51	2049		0.20	0.20	8.35	0.03	8.32	8.12
52	2050		0.20	0.20	8.35	0.03	8.32	8.12
53	2051		0.20	0.20	8.35	0.03	8.32	8.12
54	2052		0.20	0.20	8.35	0.03	8.32	8.12
55	2053		0.20	0.20	8.35	0.03	8.32	8.12

NPV: -11.9 B/C: 0.68 EIRR : 10.7%

Table E.2.18(3) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Poblacion of Dingras under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit			Balance
		Construction	O&M	Total	Flood Control	Negative	Total	
1	1999	5.90		5.90			0.00	-5.90
2	2000	0.00		0.00		0.03	-0.03	-0.03
3	2001	0.00		0.00		0.03	-0.03	-0.03
4	2002	52.29		52.29		0.03	-0.03	-52.32
5	2003	26.52	0.20	26.72	4.95	0.03	4.92	-21.80
6	2004		0.30	0.30	7.51	0.03	7.48	7.17
7	2005		0.30	0.30	7.82	0.03	7.79	7.49
8	2006		0.30	0.30	8.15	0.03	8.12	7.81
9	2007		0.30	0.30	8.49	0.03	8.46	8.16
10	2008		0.30	0.30	8.85	0.03	8.82	8.51
11	2009		0.30	0.30	9.22	0.04	9.19	8.88
12	2010		0.30	0.30	9.61	0.04	9.57	9.27
13	2011		0.30	0.30	9.90	0.04	9.87	9.56
14	2012		0.30	0.30	10.21	0.04	10.17	9.87
15	2013		0.30	0.30	10.52	0.04	10.48	10.18
16	2014		0.30	0.30	10.84	0.04	10.80	10.50
17	2015		0.30	0.30	11.18	0.04	11.13	10.83
18	2016		0.30	0.30	11.52	0.04	11.47	11.17
19	2017		0.30	0.30	11.87	0.05	11.83	11.52
20	2018		0.30	0.30	12.23	0.05	12.19	11.88
21	2019		0.30	0.30	12.61	0.05	12.56	12.26
22	2020		0.30	0.30	13.00	0.05	12.95	12.64
23	2021		0.30	0.30	13.00	0.05	12.95	12.64
24	2022		0.30	0.30	13.00	0.05	12.95	12.64
25	2023		0.30	0.30	13.00	0.05	12.95	12.64
26	2024		0.30	0.30	13.00	0.05	12.95	12.64
27	2025		0.30	0.30	13.00	0.05	12.95	12.64
28	2026		0.30	0.30	13.00	0.05	12.95	12.64
29	2027		0.30	0.30	13.00	0.05	12.95	12.64
30	2028		0.30	0.30	13.00	0.05	12.95	12.64
31	2029		0.30	0.30	13.00	0.05	12.95	12.64
32	2030		0.30	0.30	13.00	0.05	12.95	12.64
33	2031		0.30	0.30	13.00	0.05	12.95	12.64
34	2032		0.30	0.30	13.00	0.05	12.95	12.64
35	2033		0.30	0.30	13.00	0.05	12.95	12.64
36	2034		0.30	0.30	13.00	0.05	12.95	12.64
37	2035		0.30	0.30	13.00	0.05	12.95	12.64
38	2036		0.30	0.30	13.00	0.05	12.95	12.64
39	2037		0.30	0.30	13.00	0.05	12.95	12.64
40	2038		0.30	0.30	13.00	0.05	12.95	12.64
41	2039		0.30	0.30	13.00	0.05	12.95	12.64
42	2040		0.30	0.30	13.00	0.05	12.95	12.64
43	2041		0.30	0.30	13.00	0.05	12.95	12.64
44	2042		0.30	0.30	13.00	0.05	12.95	12.64
45	2043		0.30	0.30	13.00	0.05	12.95	12.64
46	2044		0.30	0.30	13.00	0.05	12.95	12.64
47	2045		0.30	0.30	13.00	0.05	12.95	12.64
48	2046		0.30	0.30	13.00	0.05	12.95	12.64
49	2047		0.30	0.30	13.00	0.05	12.95	12.64
50	2048		0.30	0.30	13.00	0.05	12.95	12.64
51	2049		0.30	0.30	13.00	0.05	12.95	12.64
52	2050		0.30	0.30	13.00	0.05	12.95	12.64
53	2051		0.30	0.30	13.00	0.05	12.95	12.64
54	2052		0.30	0.30	13.00	0.05	12.95	12.64
55	2053		0.30	0.30	13.00	0.05	12.95	12.64

NPV: -15.5 B/C: 0.69 EIRR : 10.8%

Table E.2.18(4) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Cura River Basin under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	35.38		35.38					0.00	-35.38
2	2000	118.44		118.44				0.00	-0.00	-118.44
3	2001	133.15	0.34	133.49	23.79			0.00	23.79	-109.70
4	2002	133.43	0.73	134.16	46.25			0.00	46.25	-87.91
5	2003	121.25	1.13	122.38	70.60			0.00	70.60	-51.78
6	2004		1.47	1.47	94.78	2.11	0.58	0.00	97.46	95.99
7	2005		1.47	1.47	98.76	4.34	1.15	0.00	104.26	102.78
8	2006		1.47	1.47	102.91	6.72	1.78	0.00	111.41	109.93
9	2007		1.47	1.47	107.23	9.24	2.45	0.00	118.91	117.44
10	2008		1.47	1.47	111.73	11.90	3.16	0.00	126.79	125.32
11	2009		1.47	1.47	116.42	14.73	3.25	0.00	134.40	132.93
12	2010		1.47	1.47	121.31	17.72	3.35	0.00	142.38	140.91
13	2011		1.47	1.47	125.09	20.87	3.46	0.00	149.42	147.95
14	2012		1.47	1.47	128.99	24.21	3.57	0.00	156.76	155.29
15	2013		1.47	1.47	133.01	27.74	3.68	0.00	164.42	162.94
16	2014		1.47	1.47	91.05	31.46	3.79	0.00	126.29	124.82
17	2015		1.47	1.47	93.89	35.38	3.91	0.00	133.17	131.70
18	2016		1.47	1.47	96.81	39.52	4.03	0.00	140.35	138.88
19	2017		1.47	1.47	99.83	43.88	4.15	0.00	147.85	146.38
20	2018		1.47	1.47	102.94	48.47	4.28	0.00	155.68	154.21
21	2019		1.47	1.47	106.14	53.30	4.42	0.00	163.86	162.38
22	2020		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
23	2021		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
24	2022		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
25	2023		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
26	2024		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
27	2025		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
28	2026		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
29	2027		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
30	2028		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
31	2029		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
32	2030		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
33	2031		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
34	2032		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
35	2033		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
36	2034		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
37	2035		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
38	2036		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
39	2037		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
40	2038		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
41	2039		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
42	2040		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
43	2041		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
44	2042		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
45	2043		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
46	2044		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
47	2045		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
48	2046		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
49	2047		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
50	2048		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
51	2049		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
52	2050		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
53	2051		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
54	2052		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78
55	2053		1.47	1.47	109.45	58.39	4.42	0.00	172.25	170.78

NPV: 158.0 B/C: 1.45 EIRR : 20.5%

Table E.2.18(5) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Solsona River Basin under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	16.34		16.34					0.00	-16.34
2	2000	67.66		67.66				0.00	-0.00	-67.67
3	2001	60.87	0.21	61.08	18.31			0.00	18.30	-42.78
4	2002	52.28	0.41	52.69	32.91			0.00	32.91	-19.79
5	2003	53.03	0.62	53.65	46.68			0.00	46.68	-6.96
6	2004		0.82	0.82	61.75	0.86	0.13	0.00	62.75	61.93
7	2005		0.82	0.82	64.37	1.78	0.27	0.00	66.41	65.59
8	2006		0.82	0.82	67.10	2.75	0.42	0.00	70.26	69.44
9	2007		0.82	0.82	69.94	3.78	0.57	0.00	74.29	73.47
10	2008		0.82	0.82	72.91	4.87	0.74	0.00	78.51	77.69
11	2009		0.82	0.82	76.00	6.02	0.76	0.00	82.78	81.96
12	2010		0.82	0.82	79.22	7.25	0.78	0.00	87.25	86.43
13	2011		0.82	0.82	81.68	8.54	0.81	0.00	91.03	90.21
14	2012		0.82	0.82	65.76	9.90	0.83	0.00	76.49	75.67
15	2013		0.82	0.82	67.81	11.34	0.86	0.00	80.00	79.19
16	2014		0.82	0.82	69.91	12.87	0.89	0.00	83.66	82.84
17	2015		0.82	0.82	72.09	14.47	0.91	0.00	87.47	86.65
18	2016		0.82	0.82	74.33	16.16	0.94	0.00	91.43	90.61
19	2017		0.82	0.82	76.64	17.94	0.97	0.00	95.56	94.74
20	2018		0.82	0.82	79.03	19.82	1.00	0.00	99.85	99.03
21	2019		0.82	0.82	81.49	21.80	1.03	0.00	104.31	103.49
22	2020		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
23	2021		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
24	2022		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
25	2023		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
26	2024		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
27	2025		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
28	2026		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
29	2027		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
30	2028		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
31	2029		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
32	2030		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
33	2031		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
34	2032		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
35	2033		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
36	2034		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
37	2035		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
38	2036		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
39	2037		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
40	2038		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
41	2039		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
42	2040		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
43	2041		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
44	2042		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
45	2043		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
46	2044		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
47	2045		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
48	2046		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
49	2047		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
50	2048		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
51	2049		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
52	2050		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
53	2051		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
54	2052		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11
55	2053		0.82	0.82	84.02	23.88	1.03	0.00	108.93	108.11

NPV: 155.2 B/C: 1.94 EIRR : 26.4%

Table E.2.18(6) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Madongan River Basin under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	23.53		23.53					0.00	-23.53
2	2000	89.90		89.90				0.00	0.00	-89.90
3	2001	81.90	0.28	82.17	18.12			0.00	18.12	-64.05
4	2002	81.93	0.52	82.45	32.43			0.00	32.43	-50.02
5	2003	83.10	0.76	83.86	47.84			0.00	47.84	-36.02
6	2004		1.01	1.01	64.62	0.52	0.66	0.00	65.80	64.79
7	2005		1.01	1.01	67.16	1.07	1.32	0.00	69.55	68.54
8	2006		1.01	1.01	69.80	1.65	2.05	0.00	73.50	72.49
9	2007		1.01	1.01	72.55	2.27	2.82	0.00	77.63	76.62
10	2008		1.01	1.01	75.40	2.92	3.63	0.00	81.95	80.94
11	2009		1.01	1.01	78.37	3.61	3.74	0.00	85.72	84.71
12	2010		1.01	1.01	81.45	4.35	3.86	0.00	89.65	88.64
13	2011		1.01	1.01	83.94	5.12	3.98	0.00	93.04	92.03
14	2012		1.01	1.01	86.52	5.94	4.10	0.00	96.55	95.55
15	2013		1.01	1.01	89.17	6.80	4.23	0.00	100.20	99.19
16	2014		1.01	1.01	91.90	7.72	4.36	0.00	103.97	102.97
17	2015		1.01	1.01	94.72	8.68	4.49	0.00	107.89	106.88
18	2016		1.01	1.01	97.62	9.69	4.63	0.00	111.95	110.94
19	2017		1.01	1.01	100.61	10.76	4.78	0.00	116.15	115.14
20	2018		1.01	1.01	103.70	11.89	4.92	0.00	120.51	119.50
21	2019		1.01	1.01	106.88	13.07	5.08	0.00	125.03	124.02
22	2020		1.01	1.01	110.15	14.32	5.08	0.00	129.55	128.54
23	2021		1.01	1.01	110.15	14.32	5.08	0.00	129.55	128.54
24	2022		1.01	1.01	110.15	14.32	5.08	0.00	129.55	128.54
25	2023		1.01	1.01	110.15	14.32	5.08	0.00	129.55	128.54
26	2024		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
27	2025		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
28	2026		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
29	2027		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
30	2028		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
31	2029		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
32	2030		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
33	2031		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
34	2032		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
35	2033		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
36	2034		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
37	2035		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
38	2036		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
39	2037		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
40	2038		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
41	2039		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
42	2040		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
43	2041		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
44	2042		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
45	2043		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
46	2044		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
47	2045		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
48	2046		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
49	2047		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
50	2048		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
51	2049		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
52	2050		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
53	2051		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
54	2052		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81
55	2053		1.01	1.01	85.42	14.32	5.08	0.00	104.82	103.81

NPV: 109.7 B/C: 1.47 EIRR : 20.7%

Table E.2.18(7) Economic Cost and Benefit Stream of Sabo and Flood Control Project in Papa River Basin under Future Condition

(Unit : Million Pesos)

Serial Year	Year	Cost			Benefit					Balance
		Const-ruction	O&M	Total	Flood Control	Land Loss Prevention	Land Use Restration	Negative	Total	
1	1999	16.67		16.67					0.00	-16.67
2	2000	62.85		62.85				0.00	0.00	-62.85
3	2001	58.58	0.18	58.76	7.50			0.00	7.50	-51.26
4	2002	58.70	0.35	59.05	13.54			0.00	13.54	-45.51
5	2003	58.45	0.52	58.96	20.06			0.00	20.06	-38.91
6	2004		0.68	0.68	27.04	0.23	0.01	0.00	27.28	26.60
7	2005		0.68	0.68	28.11	0.47	0.01	0.00	28.60	27.92
8	2006		0.68	0.68	29.22	0.73	0.02	0.00	29.97	29.29
9	2007		0.68	0.68	30.38	1.00	0.03	0.00	31.41	30.73
10	2008		0.68	0.68	31.58	1.29	0.04	0.00	32.91	32.23
11	2009		0.68	0.68	32.83	1.59	0.04	0.00	34.46	33.78
12	2010		0.68	0.68	34.12	1.92	0.04	0.00	36.08	35.40
13	2011		0.68	0.68	35.17	2.26	0.04	0.00	37.47	36.79
14	2012		0.68	0.68	36.25	2.62	0.04	0.00	38.92	38.24
15	2013		0.68	0.68	37.36	3.00	0.05	0.00	40.41	39.73
16	2014		0.68	0.68	38.51	3.41	0.05	0.00	41.96	41.28
17	2015		0.68	0.68	39.69	3.83	0.05	0.00	43.57	42.89
18	2016		0.68	0.68	40.91	4.28	0.05	0.00	45.24	44.56
19	2017		0.68	0.68	42.17	4.75	0.05	0.00	46.97	46.29
20	2018		0.68	0.68	43.46	5.25	0.05	0.00	48.76	48.08
21	2019		0.68	0.68	44.80	5.77	0.05	0.00	50.62	49.94
22	2020		0.68	0.68	46.17	6.32	0.05	0.00	52.55	51.87
23	2021		0.68	0.68	46.17	6.32	0.05	0.00	52.55	51.87
24	2022		0.68	0.68	46.17	6.32	0.05	0.00	52.55	51.87
25	2023		0.68	0.68	46.17	6.32	0.05	0.00	52.55	51.87
26	2024		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
27	2025		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
28	2026		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
29	2027		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
30	2028		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
31	2029		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
32	2030		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
33	2031		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
34	2032		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
35	2033		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
36	2034		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
37	2035		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
38	2036		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
39	2037		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
40	2038		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
41	2039		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
42	2040		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
43	2041		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
44	2042		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
45	2043		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
46	2044		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
47	2045		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
48	2046		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
49	2047		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
50	2048		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
51	2049		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
52	2050		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
53	2051		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
54	2052		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80
55	2053		0.68	0.68	34.10	6.32	0.05	0.00	40.48	39.80

NPV: -26.0 B/C: 0.84 EIRR : 12.9%

Table E.2.19 · Economic Efficiency of Objective Project under Present Condition

	Work Item	EIRR (%)	*1 B/C	*2 NPV Million Pesos)
I.	Priority Project	12.4	0.82	-190.2
II.	Component Schemes			
1	1. Sabo Dams and Alluvial Fan River Improvement			
2	(1) Cura/Labugaon River	12.4	0.82	-64.5
3	(2) Solsona River	16.1	1.08	13.5
4	(3) Madongan River	12.8	0.84	-37.5
5	(4) Papa River	7.2	0.48	-86.2
6	2. Laoag-Bongo River Improvement			
7	(1) Poblacion of Laoag	30.2	2.01	36.3
8	(2) Poblacion of San Nicolas	5.8	0.42	-21.6
9	(3) Poblacion of Dingras	5.5	0.39	-30.2

Note: *1 Discounted at 15%.

Table E.2.20 Economic Efficiency of Objective Project under Future Condition

	Work Item	EIRR (%)	*1 B/C	*2 NPV Million Pesos)
I.	Priority Project	20.3	1.43	441.8
II.	Component Schemes			
1	1. Sabo Dams and Alluvial Fan River Improvement			
2	(1) Cura/Labugaon River	20.5	1.45	158.0
3	(2) Solsona River	26.4	1.94	155.2
4	(3) Madongan River	20.7	1.47	109.7
5	(4) Papa River	12.9	0.84	-26.0
6	2. Laoag-Bongo River Improvement			
7	(1) Poblacion of Laoag	41.6	3.26	81.7
8	(2) Poblacion of San Nicolas	10.7	0.68	-11.9
9	(3) Poblacion of Dingras	10.8	0.69	-15.5

Note: *1 Discounted at 15%.