

## **4. Project Evaluation**

### **4.1 Economic and Financial Evaluation**

#### **4.1.1 Economic Evaluation**

The model sites in this zone are Maumere (Kalimati/Wuring), Paga, and Ende. The basic inputs are facility improvements, the purchase of equipment and materials, and activity costs. These costs will be converted to economic costs in the economic evaluation.

The basic inputs are facility improvements, the purchase of equipment and materials, and activity costs. In the economic evaluation, these costs will be converted into economic prices.

The benefits are 1) reduced working hours due to improved basic fishing port facilities, 2) increased value added of fresh fish supply due to improved processing and marketing facilities, 3) reduced costs due to efficient and improved transport and loading activities, 4) increased consumption of ice due to lower ice price, and 5) new technology and resource management by fishermen due to the provision of a model fishing boat. In addition, trial activities to reduce suspended business operations and health costs by improving the fishing village environment will also be implemented.

The evaluation period will be 15 years and basic inputs will be implemented in FY0. In addition, the required renovation inputs in conjunction with the physical lifespan years of the facility have been added, and the cost of the terminal value in FY16 has been added.

## (1) Benefits

Added Benefits	Without Project			With Project	
Fish landing volume	Remains the same.			Remains the same	
Reduced working hours	Unable to secure time for fishing activities Excessive burden on fishing village women			By reducing the landing time, the time for fishery activities is secured, sustainable resources management becomes possible (opportunity cost in terms of fish catch has been added)	
Increased value added fresh fish supply	Fresh fish ratio: Unsold ratio:	Maumere 56% 14%	Paga 48% 10%	Maumere 74%	Paga 61%
	Fresh fish ratio: Unsold ratio:	Ende 57% 12%		Ende 70%	Unsold ratio: Improved to 0% Processed retail price: 50% increase
Cost reduction due to marketing over a wide region	Due to the lack of a refrigerated truck, fresh fish is not shipped.			Price difference between average fish price in west Flores region (Rp.4,000/kg) due to consumer surplus	
Decreased ice price due to consumer surplus	Current market price Kalimati/Wuring Rp.500/kg Paga Rp.1000/kg Paupanda Rp.750/kg			5kg ice bag Kalimati/Wuring Rp.340/kg Paga Rp.440/kg Paupanda Rp.320/kg 25kg block ice Kalimati/Wuring Rp.320/kg Paga Rp.420/kg Paupanda Rp.300/kg	
New technology and resource management by fishermen due to the provision of a model fishing boat	Overfishing of coastal resources			Improve infrastructure to extend fishing grounds in future	
Fishing village improvements (garbage collection system)	Regular garbage collection activities			Garbage containers will be distributed and regular collection activities implemented.	

## (2) Calculating the Benefits

### 1) Increase of value of landed fish catch

	Motorized boat	Operational efficiency	Possible fishing days	Catch/day (non-motorized)	Catch/day (motorized)	Annual increased quantity	Annual increase value (Rp Million)
Paga	33	1.00	360	6 kg	24 kg	214 tons	428
Ende Is.	136	0.60	300	10 kg	40 kg	734 tons	1,468

Of the annual increase of value of fish landed mentioned above, about 50 percent is assumed to be operational cost (fuel and maintenance) increased by motorization. Consequently, the benefit of motorization is assumed to be 50 percent of the above landed value.

### 2) Time saving

The improvements in the basic fishing port facilities will reduce the fish landing time, the transport time during the low tide, the preparation time (refueling, restocking boat supplies), and the embarkation and disembarkation of the marine ferry boat (see Table 6-2-1, Appendix 6).

Although the fish catch revenue according to time greatly differs according to fishing method and fishing period, Rp.2000/hour was used here. As a result, the benefits were calculated as shown in the table below.

Unit: Rp. million					
Time Reductions	Maumere (Kalimati)	Maumere (Wuring)	Paga	Ende	Total
Landing time	153.3	6.5	7.9	112.8	280.5
(during high wind waves)				2.5	2.5
Waiting time	66.1				66.1
Refueling time	14.4	3.2	8.5	9.5	35.6
Restocking water	14.4	3.2	8.5	9.5	35.6
Fishing gear repair		127.8			127.8
(transport time)		6.3			6.3
Other fisheries activities		45.5			45.5
Total	248.2	192.5	24.9	134.3	599.9

3) Increased supply of value added fresh fish

The breakdown of the annual handling volume, irrespective of whether the project is implemented or not, has been summarized in the table below.

(a) Kalimati/Wuring

Unit: Ton/year			
		With the Project	Without the Project
Fresh fish	In the zone	1,824	2,085
	Outside the zone		324
Processed fish		971	842
Unsold fish		456	0
Total		3,251	3,251

(b) Paga

Unit: Ton/year			
		With the Project	Without the Project
Fresh fish	In the zone	558	654
	Outside the zone		58
Processed fish		485	452
Unsold fish		121	0
Total		1,164	1,164

(c) Paupanda

Unit: Ton/year			
		With the Project	Without the Project
Fresh fish	In the zone	1,778	1,933
	Outside the zone		274
Processed fish		977	938
Unsold fish		3390	0
Total		3,145	3,145

Although the retail price differs greatly according to fish species and fishing period, the average fresh fish price was set at Rp.2,000/kg, three-fourths of this price for processed fish, and one-half this price for unsold fish. In addition, the value added of processed products is anticipated to increase by 50 percent due to improved processing technology. The benefits have been summarized in the table below.

## (a) Kalimati/Wuring

Unit: Rp million/year

		With the Project	Without the Project	Benefit
Fresh fish	In the zone	3,648.0	4,170.0	638.0
	Outside the zone		116.0	
Processed fish	In/out of the region	1,456.5	1,263.0	193.5
	Increased value added	0.0	631.5	631.5
Unsold fish		456.0	0.0	456.0
Total		5,560.5	6,180.5	620.0

## (b) Paga

Unit: Rp million/year

		With the Project	Without the Project	Benefit
Fresh fish	In the zone	1,116.0	1,308.0	308.0
	Outside the zone		116.0	
Processed fish	In/out of the region	727.5	678.0	49.5
	Increased value added	0.0	339.0	339.0
Unsold fish		121.0	0.0	121.0
Total		1,964.5	2,441.0	476.5

## (c) Paupanda

Unit: Rp million/year

		With the Project	Without the Project	Benefit
Fresh fish	In the zone	3,556.0	3,866.0	858.0
	Outside the zone		548.0	
Processed fish	In/out of the region	1,465.5	1,407.0	58.5
	Increased value added	0.0	703.5	703.5
Unsold fish		390.0	0.0	390.0
Total		5,411.5	6,524.5	1,113.0

## 4) Reduced transport costs

Fresh fish will be marketed over a widespread area with the provision of a refrigerated truck in this project. Hence a consumer surplus in the fresh fish supply in areas where the average fish price exceeds Rp.4,000/kg is anticipated in the western Flores region. The price difference of Rp.2,000/kg between raw fish was added as a benefit.

An annual transport volume of 324 tons from Maumere and 332 tons from Paupanda is targeted for the western Flores region. The benefit in Paupanda amounts to Rp 664 million (332 tons x Rp 2,000/kg).

In addition with the provision of a multipurpose transport boat from Ende Island, fresh fish shipments as well as water supplies on the boat's return trip will be transported. Thus, the intent to pay will rise when the boat is chartered by ten people at more than Rp.100,000/trip + drinking water costs. But the project revenue has been included as simply a willingness to pay.

Willingness to pay = (Rp.0.24 million/trip + Rp.0.245 million/trip) x 300 days/year

Subsequently, the benefit has been added as shown in the following table.

Rp million/year

		Kalimati	Paupanda	Total
Consumer surplus due to refrigerated truck		648.0	664.0	1,312.0
Consumer surplus due to multipurpose transport boat	Willingness to pay (rental fees)		102.0	102.0
	Secure drinking water, ice, fuel, etc.		73.5	73.5
Total		648.0	839.5	1,487.5

5) Increased consumer surplus due to inexpensive ice price

The estimated ice sales volume is shown in the table below. Hence, the following benefits have been added.

Rp million/year			
	Sales Volume (ton/year)	Price Difference (Rp./kg)	Benefit
Kalimati/Wuring			
- 5kg	316	160	50.56
- 25kg	494	180	88.92
Paga			
- 5kg	423	560	236.88
- 25kg	9	580	5.22
Paupanda			
- 5kg	814	430	350.02
- 25kg	401	450	180.45
Total	2,457		1,000.97

6) New technology and resource management by fishermen due to the provision of a model fishing boat

The aim of the model fishing boat is to develop new fishing grounds and to build the capacity of the fishermen to achieve this objective. As explained in later sections, although there are limitations to direct increases in fish catch revenue, the opportunity for fishermen to acquire new experience, knowledge, and technology through the use of the model fishing boat is extremely significant. Although it is difficult to quantify, the benefit was added as twice the fish catch revenue for 15 years.

$$\text{Benefit} = \text{Rp.216 million/year} \times 2 = \text{Rp.432 million/year}$$

The cost is counted for only 10 years, and after 10 years it is assumed that a similar model boat will be introduced by credit and the operation is maintained.

In addition, an annual amount of Rp.17.5 million was added as a benefit derived from coastal resources with the introduction of a high-speed boat for surveillance activities and the collection of licensing fees.

7) Improvements of the Fishing Village Environment

According to the field survey conducted in Rompo, it was found that the quality of the living environment was a major factor that affected the disease ratio. Therefore, a decrease in the number of sick leave days and health and transport costs were calculated into the benefits that would be derived from the project. According to the survey, an annual benefit of Rp.48,900 would be generated per household (refer Table 6.4.19, Appendix 6). The same benefit was assumed for Wuring and with the implementation of an improved garbage collection system; an added benefit of Rp.19.3 million will be generated for 397 households.

In Paga, other water supply and model toilet facilities are planned, but the benefit is not calculated due to limited number of users.

**(3) Economic Costs of the Project**

The conversion factors used for the calculations are identical to the figures for Rompo. For details refer 4.1.1 (3) in Bima Priority Zone.

**(4) Economic Internal Rate of Return**

The EIRR for Kalimati was 12 percent, 25 percent for Paga, and 19 percent for

Paupanda since the benefits generated by the ice-making, marketing, and processing facilities are large.

(a) **Kalimati/Wuring**

Evaluated Project	Unit: Rp million/15 years		
	Benefit	Cost	EIRR (%)
Coastal resources management	6,176	5,246	5
Fish landing/handling, marketing, processing improvements, etc.	41,569	18,541	13
Improved living environment of fishing villages	290	36	156
<b>Total</b>	<b>48,035</b>	<b>23,823</b>	<b>12</b>

(b) **Paga**

Evaluated Project	Unit: Rp million/15 years		
	Benefit	Cost	EIRR (%)
Coastal resources management	6,767	3,933	39
Fish landing/handling, marketing, processing improvements, etc.	11,151	4,089	24
Improved living environment of fishing villages	-	10	N.A
<b>Total</b>	<b>17,918</b>	<b>8,032</b>	<b>25</b>

Note: Includes benefit of motorization.

(c) **Paupanda**

Evaluated Project	Unit Rp million/15 years		
	Benefit	Cost	EIRR (%)
Coastal resources management	28,638	16,809	35
Fish landing/handling, marketing, processing improvements, etc.	39,247	19,700	15
Improved living environment of fishing villages	-	-	-
<b>Total</b>	<b>67,885</b>	<b>36,509</b>	<b>19</b>

Note: Includes benefit of motorization.

(5) **Sensitivity Analysis**

Several postulations have been used in calculating the benefits and the converting the economic costs in this analysis. The EIRR that affects this entire priority zone was reviewed.

Fluctuation Range	Benefit+10%	Benefit±0%	Benefit-10%
Cost +10%	12	10	7
Cost ±0%	15	12	9
Cost -10%	18	15	12

The effect of the increased costs is almost same as the increased benefits. The overall EIRR will slightly improve to 19%. In case of construction of basic infrastructure is delayed for two years due to constraints in getting investment, the overall EIRR will increase slightly to 19% because the benefit is large.

(6) **Distribution of Benefits**

The largest benefit is the increase in the fresh fish supply and its value-added due to the use of ice and insulated boxes. This will lead to a direct increase in income not only for the traders and retailers, but also for the fishing village women who are engaged in fish processing activities. There are very few projects that lead to an immediate increase in production for fishermen, and the distribution of short-term benefits is difficult. But through stringent resources management, long-term benefits will be generated.

## 4.1.2 Financial Evaluation

### (1) Basic Concept on Cost Distribution

In principle, the beneficiaries will bear the operating costs of the ice making, processing, and marketing facilities. The renovation and repair costs of the basic facilities, such as the landing facility, strengthening the cooperatives and surveillance activities (data collection for resources management, monitoring, and cost of controlling illegal fishing activities) will be borne by the district government. The general activity costs of the fishermen's association that will be in charge of the operations and maintenance of the facilities will be covered by membership dues or its deposits. The cost of the FADs will be covered by the fishing ground user fees.

Although depreciation costs should be included in this evaluation, the evaluation was limited to renewal inputs.

### (2) Estimated Revenue

#### 1) Revenues generated by the fisheries complex

##### (a) Ice-making, marketing, and processing facilities

The following sales revenues were estimated for the ice making, marketing, and processing facilities (see Tables 5-2-6 to 5-2-8, Appendix 5).

Unit: Rp million				
Revenue Source	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Kalimati/Wuring	316.53	339.71	358.26	348.98
Paga	202.01	207.50	211.90	209.70
Paupanda	419.82	437.57	451.77	444.67
<b>Total</b>	<b>938.36</b>	<b>984.78</b>	<b>1,021.93</b>	<b>1,003.35</b>

Note: Facility user fees have been included.

##### (b) Refrigerated Truck

The cooperative will collect rental fees for use of the refrigerated truck as shown in Table 5-3-2, Appendix 5. The party renting the truck will be responsible for paying for fuel costs.

Unit: Rp million				
Rental Revenue	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Maumere	0.90	0.92	0.96	0.94
Ende	0.90	0.92	0.96	0.94

##### (c) Multipurpose Transport Boat

Rental fees will be collected by the managing cooperative for the multipurpose transport boat, in conjunction with income generating retail activities for drinking water, ice, fuel, and other supplies (see Table 5-4-6, Appendix 5).

Rental Revenue	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Rental fees (Rp million/times)	0.300	0.320	0.350	0.340
Drinking water, ice, fuel sales	0.245	0.245	0.245	0.245
<b>Annual revenue (Rp million/year)</b>	<b>163.5</b>	<b>169.5</b>	<b>178.5</b>	<b>174.7</b>

2) Revenue of the district government

(a) Model fishing boat

A model fishing boat will be provided to promote the modernization and use of larger fishing boats. As in the case of Waworada, sales revenue generated by the sales of fresh fish landed from 88 fishing trips/year was estimated at Rp. 215.6 million. The benefit is calculated for only 10 years as the lifespan of a model fishing boat is about 10 years.

(b) Resources management

A fishing licensing system similar to the system in Bima district will be introduced, and revenue of Rp.17.5 million/year for Sikka district and Rp.10.0 million was estimated for Ende district.

(c) Extension activities to introduce fresh fish handling technology and fish processing

The capital required to implement extension activities to introduce fresh fish handling technology and fish processing will be provided by the district FO. The operating cost for the first fiscal year was estimated at Rp. 85.9 million for Sikka district and Rp.85.39 for Ende district.

(d) Strengthening the cooperative

The capital required to strengthen the cooperatives will be provided by the district FO (see section 2.5.2 (5) 2)).

(3) Summary of Expenditures

1) Expenditures of the fisheries complex

(a) Ice-making, marketing, and processing facilities

The costs shown in Tables 5-2-6 to 5-2-8, Appendix 5 were used as the estimated expenditures of the ice making, marketing, and processing facilities.

Operating Costs	Unit: Rp million/year			
	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Kalimati	268.26	274.38	286.62	281.72
Paga	129.87	135.40	146.44	142.02
Paupanda	314.05	322.23	338.60	332.05
Total	712.18	732.01	771.66	755.79

(b) Refrigerated Truck

The cost given in Table 5-3-2, Appendix 5 for the refrigerated truck was used for the refrigerated truck

Operating Costs	Unit: Rp million/year			
	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Maumere	16.08	20.16	28.30	25.04
Paupanda	16.08	20.16	28.30	25.04
Total	32.16	40.32	56.60	50.08

(c) Multipurpose Transport Boat

The cost given in table 5-4-6, Appendix 5 for the multipurpose transport boat was used for the multipurpose transport boat.

Operating Costs	Unit: Rp million/year			
	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Ende Island	66.38	77.56	99.90	90.96



2) Revenue of the district government

(a) Resources management conservation costs

The conservation costs shown in Table 6-2-1, Appendix 6 was used (Rp.43.25 million/year for Maumere, Rp.26.91 million/year for Ende).

(b) Model fishing boat

The cost given in Table 5-1-4, Appendix 5 was used for the costs incurred by the model fishing boat. A total cost of Rp.205.8 million was estimated based on operating cost (Rp.143.9 million), revenue distribution to crew (Rp.35.9 million), and maintenance cost (Rp.26.0 million). The benefit is calculated for only 10 years as the lifespan of a model fishing boat is about 10 years.

(c) High-speed boat

The cost given in section 2.5.2 (1) 2) (C) was used for the high-speed boat.

Unit: Rp million/year				
Operating cost	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Sikka/Ende districts	13.2	14.8	18.0	16.7

(d) Other activity cost

Other activity costs have been summarized in the tables below.

[Sikka District]

Unit: Rp million/year				
Operating cost	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Guidance for fishing village environmental improvements	4.0	0.0	0.0	0.3
Education, training	31.8	45.6	60.3	9.2
Organizing cooperatives, operations	51.5	73.3	244.3	24.6
Total	87.3	119.5	304.6	34.1

[Ende District]

Unit: Rp million/year				
Operating cost	Initial 2 years	3 – 5 years	6 – 15 years	Annual Average
Guidance for fishing village environmental improvements	4.0	0.0	0.0	0.3
Education, training	15.9	22.8	30.2	4.6
Organizing cooperatives, operations	25.7	36.6	122.2	12.3
Total	45.6	59.4	152.4	17.2

(4) Revenues and Expenditures

Based on the estimations given above, the expenditures and revenues of the Maumere site (Kalimati, Wuring) were calculated and are shown below.

(a) Kalimati/Wuring

Unit: Rp.million/15 year				
Facility, Equipment and Materials	Revenue (A)	Operations Cost (B)	Renewal Input (c)	Expenditures (A-B-c)
Functional facilities				
- Ice-making machine, etc.	5,234.8	4,225.9	149.1	859.8
- FAD	1,125.0		1,125.0	0.0
- Refrigerated truck	2,832.0	375.6	1,630.9	825.5
- Model fishing boat	1,971.2	1,965.0	0.0	6.2
Surveillance activities, etc.	262.5	2,050.3	463.8	-2,251.6
Basic facilities	-	-	1,395.8	-1,395.8
Total	11,425.5	8,616.8	4,754.6	-1,955.9

(b) Paga

Unit: Rp million/15 year

Facility, Equipment and Materials	Revenue (A)	Operations Cost (B)	Renewal Input (c)	Expenditures (A-B-c)
Functional facilities				
- Ice-making machine, etc.	3,145.5	2,130.3	96.5	918.7
- FAD	375.0		375.0	0.0
Surveillance activities, etc.	0.0	385.6	562.9	-948.5
Basic facilities	-	-	425.0	-425.0
Total	3,520.5	2,515.9	1,459.4	-454.8

(c) Paupanda

Unit: Rp million/15 year

Facility, Equipment and Materials	Revenue (A)	Operations Cost (B)	Renewal Input (c)	Expenditures (A-B-c)
Functional facilities				
Ice-making machine, etc.	6,670.1	4,980.8	266.5	1,422.8
FAD	1,500.0	-	1,500.0	0.0
Refrigerated truck	2,832.0	375.6	1,630.9	825.5
Multipurpose transport boat	2,620.5	1,364.4	0.0	1,256.1
Model fishing boat	2,156.0	2,057.4	0.0	98.6
Surveillance activities, etc.	150.0	1,492.9	1,545.1	-2,888.0
Basic facilities	-	-	1,114.7	-1,114.7
Total	15,928.6	10,271.1	6,057.2	-399.7

Based on the figures shown above, the marketing, processing facilities, refrigerated truck and multipurpose transport boat will operate in the black, but the basic facilities are unable to cover the initial input, much less replacement input. This is because the lifespan years for the model fishing boat are ten years. Moreover, the replacement input for the basic facilities is an even greater problem.

Although the district government will provide the costs of surveillance and other activities, it is necessary for the Sikka district fisheries office to allocate 69 percent its Rp.391.7 million management budget for the first fiscal year and 38 percent after three years. In the case of the Ende district fisheries office, the operating budget is Rp.795.4 million and it will be necessary to allocate 20 percent of the budget for the first fiscal year and 8 percent after three years. The district fisheries office must strive to secure a budget within the district government.

(5) Calculation of the FIRR

Based on the estimations above, the FIRR for the fisheries complex at Kalimati is minus 1 percent, 0 percent for Paga, and 1 percent for Ende. If 80 percent of the input cost for the first fiscal year is provided under government fund, the FIRR will rise to 30 percent for Maumere, 28 percent for Paga, and 36 percent for Ende. But the overall FIRR including the financial burden of the district fisheries office is 0% for Maumere, 1% for and minus 2% for Ende.

(6) Sensitivity Analysis

If the revenue and expenditures of the fisheries complex were fluctuated at +10% and 10%, the results are as shown in the table below.

[Sikka District]

	Revenue+10%	Revenue 0%	Revenue-10%
Input amount +10%	1	-2	N.A.
Input amount 0%	3	0	-5
Input amount -10%	6	2	-3

The effect of increased input is much large that the effect of decreased input.

[Ende District]

Range of Input	Revenue+10%	Revenue 0%	Revenue-10%
Input amount +10%	3	-1	-4
Input amount 0%	5	1	-3
Input amount -10%	7	3	-1

The effect of increased input is much large that the effect of decreased input.

## 4.2 Environmental Evaluation

### (1) Kalimati,

The construction of the Kalimati facilities on reclaimed land will have significant positive impact on the navigation by removing/burying the obstruction from the old foundation destroyed by the tsunami of 1992. Although the reclamation is not expected to cause significant negative impact, as precautionary measures, monitoring of the surrounding sea bed profile change for a few seasons is recommended to properly gauge the impact if any and as early warning to avert unexpected impact. Mitigation measures recommended should be carried out to mitigate the temporary significant impacts of the construction activities such as dust, noise and increase constructional traffic during construction stage

The monitoring, control and surveillance system should be closely coordinated with the Coremap project and its POKJA (Working Group) that undertake conservation activities, to increase its effectiveness, efficiency and to maximize its positive impact on long term sustainable fisheries.

Considering the scale of the project, the legal requirement under AMDAL, and the resulting significant impacts, EIA is not required.

### (2) Wuring

The reclaimed island at the end of the village road could indirectly impact on excessive accumulation of rubbish that is indiscriminately thrown into the sea. To mitigate this impact will require an awareness campaign to affect a habit change and to also promote a rubbish collection system in the community. Mitigation measures recommended should be carried out to mitigate the temporary significant impacts of the construction activities such as dust, noise and increase constructional traffic during construction stage; this is especially important as there is only one village road leading to the project site with all villager and activities using this road.

Considering the scale of the project, the legal requirement under AMDAL, and the resulting significant impacts, EIA is not required.

### (3) Paupanda

The removal of the isolated coral rocks will have positive impact on the navigation

and safety for the small boats to land on the beach. Although the removal is not expected to affect significantly the local currents or shore processes, as a precautionary measure, monitoring of the beach profile change for a few seasons is recommended to properly gauge the impact if any and as early warning to avert unexpected impact.

Considering the scale of the project, the legal requirement under AMDAL, and the resulting significant impacts, EIA is not required.

**(4) Paga**

The significant impacts of construction are expected to be only from the nuisance from the constructional activities such as dust, noise and increase constructional traffic. These temporary impacts could be mitigated by implementing the recommended counter measures during construction. Consensus for the demolition of existing un-used structures should be reconfirmed with KUD Mina to avoid any misunderstanding.

Considering the scale of the project, the legal requirement under AMDAL, and the resulting significant impacts, EIA is not required.

### **4.3 Social Evaluation**

Each small-scale fisheries development project that will be implemented in the targeted zones will benefit not only fishermen, but also fishing village women and young people.

**(1) Impact on the Local Society**

A widespread fish marketing system will be established and fishermen incomes will be improved in this zone. The anticipated improvements in fishermen income was estimated according to the three regions that comprise this zone, Kalimati, Ende, and Paga.

The average per capita fisherman income in Kalimati in FY2001 was Rp.1.33 million, which is below the per capita income of Rp.1.63 million targeted in the MP. The implementation of this project is anticipated to produce an annual benefit of Rp.6.20 billion for Kalimati. Consequently, the average income of the 1,046 fishermen households, who are the beneficiaries of this project, is estimated to rise by Rp.138,000/person; and the average per capita income of fishermen will rise to Rp.1.47 million. This falls below the per capita income targeted in the MP.

The average per capita fisherman income in Ende in FY2001 was Rp.430,000, which is greatly below the per capita income of Rp.1.63 million targeted in the MP. The implementation of this project is anticipated to produce an annual benefit of Rp.1.113 billion. Consequently, the average income of the 2,563 fishermen households, who are the beneficiaries of this project, is estimated to rise by Rp.433,000/person. With this increase, the average per capita income of fishermen will rise to Rp.504,000, but as in the case of Kalimati, this figure falls below the per capita income targeted in the MP.

Likewise, the average per capita fisherman income in Paga in FY2001 was Rp.1.58 million, which is below the per capita income of Rp.1.63 million targeted in the MP. The implementation of this project is anticipated to produce an annual benefit of Rp.476.5 million. Consequently, the average income of the 397 fishermen households, who are the beneficiaries of this project, is estimated to rise by Rp.343,000/person. With this increase, the average per capita income of fishermen will rise to Rp.1.92 million, which exceeds the per capita income targeted in the MP.

With the implementation of this project, about 656 tons of surplus fresh fish from

Central Flores will be shipped to the western Flores. In combination with fresh fish shipments from East Flores to western Flores, the total volume of fresh fish shipments is estimated at 1,010 tons. With an increase in surplus fresh fish stemming from extended fishing grounds in future, increased shipments of fresh fish to this region can be expected. In addition, increased fish landing volume will contribute greatly to augmenting incomes in this region. The multipurpose boat that will be provided in this project is especially anticipated to contribute to the economic activities of Ende Island.

Furthermore, the supplementary facilities that are planned in the fishery activity support plan will not only benefit the fishermen, but will stimulate communication among the residents and impact the entire community

## (2) Achieving Sustainability

One of the effects that are targeted is a rise in the motivation of the villagers through self-help activities to improve their living environment. Additionally, the provision of a model fishing boat to train young fishermen targets the sustained use of fishery resources through diversified fishing operations.

## (3) Gender Evaluation

As shown in the table below, reduced hours in fishing landing and marketing related tasks will greatly improve the living environment of the fishing village women. Additionally, an improved shipping system for fresh fish and improvements in fish processing technology will increase the income of the village women and generate new employment opportunities. These factors underscore the need and appropriateness of the project's implementation in terms of the gender issue.

Beneficiaries and Scope of Benefits for Women Anticipated From the Project

Name of Project	Beneficiary	Benefits for Women	Benefits
1 Plan of Coastal Resources Management			
1) Project of Data Collection system Improvement	Fishermen	×	• Guidance to improve the economic state of fishermen households based on the collected data
2) Project of Fishery Licensing System Expansion	Fishermen	×	• Due to the appropriate scope of fisheries, sustainable fisheries system will be created.
3) Project of Fishing Ground Expansion Promotion	Fishermen Fish Traders	○	• Training of young fishermen using the model fishing boat • Unexploited resources will be effectively utilized.
4) Project of Monitoring System of Coastal Fishing Ground	Fishermen	×	• Decreased illegal fishing activities • Guidance on appropriate use and protection of coastal resources, based on self-control
2 Fish Landing/Handling/Shipping/Processing Improvement Projects			
1) Project of Fish Landing/Handling Improvement	Fishermen Fish traders	○	• Landing time is reduced. The labor hours of village women engaged in fish sales is curtailed.
2) Project of Fish Shipment Improvement	Fish traders	○	• Improved maintenance and storage for fish freshness reduces economic marketing losses, and increases income of women engaged in fish retail activities
3) Project of Fresh Fish Handling Extension	Fish traders	○	• Transfer of technique to maintain fish freshness through use of insulated boxes to village women engaged in fish retail
4) Project of Fish Processing Improvement	Fish traders	○	• Improved income and new employment

				opportunities for women engaged in fish processing through improved processing technology
3	Plan of Fishery Activities Support			
	1) Improve supplementary processing and landing facilities	Fishermen Processors Fish traders	○	• Improve work efficiency through use of supplementary facilities.
4	Plan of Community Environmental Improvement			
	1) Project of Community Infrastructure Improvement	Fishing Villagers	○	• Tap water and a model toilet will improve the sanitary conditions of the fishing landing beach sites and strengthen the motivation for self-reliant measures maintenance issues.
	2) Improvement of social environment	Fishing Villagers	○	• Educational activities to promote the motivation of the villagers are conducted.
5	Fishermen Organization Improvement Plan			
	1) Plan of Fishermen Organization/Fishery Extension Improvement	Fishermen Fish traders	○	• The participation of village women in fishermen organizations that will be in charge of project operations and management
	2) Guidance on Project Management Methods	Fishermen Fish traders	○	• Project monitoring and guidance on evaluation techniques will be provided.
6	Education and Training Plan			
	1) Establish an extension section within the District Fisheries Office	Fisheries Office	△	• Strengthening the extension section of the District Fisheries Office will enable technical guidance to be provided for the fisheries activities of the village women.
	2) Education and training for District Fisheries extension officers and strengthening economic activities of fishermen organizations	Fisheries Office Fishermen Organization	○	• Education and training activities for leaders of women groups will be provided.

#### 4.4 Overall Evaluation

The EIRR of the development project in the targeted zone was a high 17 percent, which is indicative of a high need for the project. However, the FIRR including the financial responsibility of the district government for the entire project could not be calculated. A large portion of the investments for the first fiscal year must be covered by grant aid and financial assistance from a public institution to cover the repair costs is needed.

However, in terms of long-term goals, the creation of a resources management system is important not only for Indonesia, but for the global community as well. It is also an important source of protein for the Indonesian people. A project that strengthens the capabilities of the small-scale fishermen is important as a vital first step to improving the coastal fishing communities in the eastern region.

Implementation of the project raises no major environmental issues. Therefore, it is concluded that overall, there is a high potential to implement the project.