

APPENDICES

Appendix I
SOCIO-ECONOMIC DATA

LOCATION	Nias Island is situated in the Indian Ocean, west of Sumatera Latitude : 0°32' - 1° 32' N Longitude : 97° 03' - 97° 57'E
SIZE	Land area 4800 km ² ± 5% Coastline 400km ± 5% Continental shelf 5000 km ² ± 5%
POPULATION	Total 527,756 Density 98 per km ² Annual growth rate 2.95% Birth rate 2.40% Mortality rate 0.89% Life expectancy (1986 census) Male 58 years Female 60 years
EDUCATION	<i>Literacy rate for population 10 years and above</i> Total : 90.02% Male : 94.28% Female : 85.76% No of Govt.schools : 696 No of pupils : 91,388 (1986 census)
HEALTH	Population/hospital 139 bed Population/physician 18
NUTRITION	Per capital calorie 98% intake of requirement Per capital protein 51 gm/day intake

EMPLOYMENT	<i>Category</i>	<i>Labour (numbers)</i>	<i>(% of force)</i>
	Agriculture	234155	95.56
	Fisheries	8146	3.32
	Service		–
	Manufacturing	1564	0.63
	Construction	709	0.28
	Others	457	0.21
	Total	245031	100.00
	Rate of unemployment year 1986 : 4.07%		

TRADE (1986)	<i>Item</i>	<i>Exports Value (Rp. million)</i>	
	Rubber	474.600	32.4
	Coconut (copra oil)	225.378	15.4
	Others (clove, coffee oil for cosmetics, fruit, marine products, etc.)	763.732	52.2
	Total	1463.710	100.0

<i>Item</i>	<i>Imports Value (Rp. million)</i>	
Food	2302.434	25.71
Investment goods	3283.484	36.88
Intermediate goods	16.513	0.17
Textiles	15.180	0.16
Others*	3316.945	37.08
Total	8934.556	100.00

* Including marine products and dried fish valued at Rp 41.126m

TRADE BALANCE

	<i>Rp million</i>
Imports	8,934.556
Exports	1,463.710
Balance	– 7,470.846

Appendix II

COMMON MARINE SPECIES

<i>Scientific Name</i>	<i>Family Name</i>	<i>English Name</i>
LARGE PELAGICS		
<i>Scomberomorus spp</i>	Scombridae	Spanish mackerel (two or more species)
<i>Sphyraena spp</i>	Sphyraenidae	Barracuda (more than one species)
<i>Cornberoides spp</i>	Carangidae	Queenfish (two or more species)
<i>Coryphaena spp</i>	Coryphaenidae	Dolphinfish (two species)
<i>Auxis thazard</i>	Scombridae	Frigate tuna
<i>Auxis rochei</i>	..	Bullet tuna
<i>Euthynnus affinis</i>		Kawakawa
<i>Katsuwonus pelanis</i>		Skipjack
<i>Thunnus albacares</i>		Yellowfin
<i>Istiophorus platypterus</i>	Istiophoridae	Sailfish
<i>Makaira spp</i>	..	Marlin
<i>Xiphius gladius</i>	Xiphidae	Swordfish
<i>Sphyrna spp</i>	Sphyrnidae	Hammerhead
<i>Alopias spp</i>	Alopiidae	Thresher shark
<i>Carcharhinus spp</i>	Carcharinidae	Requiem shark
<i>Prionace glauca</i>	..	Blue Shark
DEMERSALS		
<i>Lutjanus spp</i>	Lutjanidae	Snapper
<i>Lethrinus spp</i>	Lethrinidae	Emperor bream
<i>Epinephalus spp</i>	Serranidae	Grouper
<i>Pomadasys spp</i>	Pomadasidae	Grunt
<i>Otolithes spp</i>	Sciaenidae	Croaker/Jewfish
<i>Myliobatus spp</i>	Myliobatidae	Skate
<i>Centrophorus granulosus</i>	Squalidae	Gulper shark
<i>Polynemus spp</i>	Polynemidae	Threadfin/Indjan salmon
SMALL PELAGICS		
<i>Rastrelliger Kanagurta</i>	Scombridae	Indian mackerel
<i>Sardinella spp</i>	Clupeidae	Sardine
<i>Stolephorus spp</i>	Engraulidae	Anchovy
<i>Trichiurus spp</i>	Trichiuridae	Ribbonfish (two or more species)
<i>Cypselurus spp</i>	Exocoetidae	Flying Fish (more than two species)
<i>Exocoetus spp</i>		
SHELLFISH		
<i>Penaeus spp</i>	Penaeidae	Penaeid shrimp (more than eight species)
<i>Matapenaeusspp</i>		
<i>Acetes spp</i>	Sergestidae	Prawn (Non-penaeid shrimp – two or more species)
<i>Palinurus spp</i>	Palinuridae	Spiny lobster
<i>Scylla spp</i>	Portunidae	Green mudcrab Brown mudcrab
<i>Octopus spp</i>	Cephalopoda	Octopus (more than five species)
<i>Sepia spp</i>		Cuttlefish (more than five species)
<i>Loligo spp</i>		Squid (more than five species)

Appendix III

FEATURES OF THE SOCIO-ECONOMIC APPRAISAL

1. *METHODOLOGY AND DESIGN*

The methodology and design of the appraisal were determined by the following

MANPOWER

The personnel available in Nias with the skills required for implementing such a survey were very limited and the training of staff would have entailed considerable time and expense. In the event, the subproject was fortunate in being able to employ as an Appraisal Coordinator a local teachers' training college graduate with experience in village-level development work who required little training and was able to assist in the preparation of an appropriate appraisal format. The availability of only one person to implement the appraisal in the field, however, inevitably influenced the design of the activity.

ACCESSIBILITY

Transport to and communications with many coastal areas of Nias were extremely difficult and time-consuming due to the poor conditions of the roads. Several areas were accessible only from the District Town by sea. These factors also influenced the extent of the appraisal's coverage.

LACK OF SECONDARY DATA

Basic data concerning many coastal communities, including village population, economic activities and institutions were not easily available. Statistical information formulated by the local government was available only up to subdistrict level. At village level, such data, which is normally held by the village authorities, were not always readily accessible.

These factors meant that precedence was given to evolving an appropriate appraisal design which had to be practical and could be implemented fairly rapidly by one fulltime worker. In addition, a format which would permit quick processing of the information collected was also a priority.

Taking these factors into account, a simple format was prepared comprising

- a series of matrices wherein fisherfolk were requested to directly fill the relevant data;
- a short questionnaire on specific topics and sections where fisherfolk were asked to express their own needs, problems and aspirations under a series of topic headings; and
- a village data sheet to be filled in by village leaders giving general information about the village, its people and their problems as seen by local leaders.

The methodology envisaged for implementing the appraisal in each of the selected villages was as follows

- The Appraisal Coordinator would make contact with local village officials and formal and informal leaders to introduce himself, as well as clarify the purpose of his visit. The opportunity would be taken to obtain general information about the community and the leaders' views of the conditions in the village. The village head, or his staff, would be asked to fill in a form giving some of the basic data on the village.
- Assisted by the village head, the Appraisal Coordinator would then circulate in the village, contacting villagers with a view to getting groups of fisherfolk and others together to explain the purpose of his visit, distribute the questionnaire forms and explain how they could be completed. Wherever possible, the Appraisal Coordinator would attempt to enlist help from more educated and/or interested individuals to assist in the distribution of the forms.

- Arrangements would be made for the groups to gather again over the following two or three days so that people could talk about their responses, discuss any problems or important issues and return the forms to the Appraisal Coordinator.
- The Appraisal Coordinator would attempt to meet several such groups in each village, aiming at distributing 15-20 formats per village. Fisherfolk would be the principal target group, but representatives of other occupation groups would be covered as far as possible.
- The distribution, completion and collection of formats would be supplemented by informal discussions with individuals and groups in the community during the three or four days that the Coordinator spent in each village. These discussions and any other findings and observations would be noted by the Coordinator and incorporated in brief village profiles prepared by him for the preliminary report on the appraisal.

2. *SELECTION OF TARGET VILLAGES*

A total coverage of fisherfolk communities along the entire coast of Nias would have required several months of fieldwork due to the problems in communications and access. A sample of fisherfolk communities had, therefore, to be selected, which would represent the principal types of fishing areas on the coast of the island and the main fisheries of the small-scale fisherfolk.

The selection of target villages for the appraisal was undertaken through consultation among local officials of the District Fisheries Service and the District Planning Board, BOBP staff and the Appraisal Coordinator. The experience of local fisheries officers and a description of the fisheries of the island, previously prepared by BOBP, provided a basis for selecting the target villages.

In some areas, where it proved difficult to make a selection from among a group of apparently similar villages, the final selection was left to the District Fisheries Service and the Appraisal Coordinator.

The Appraisal Coordinator was accompanied to the target area by a District Fisheries Service official at the commencement of the appraisal in order to facilitate contacts with local officials and to clarify the purpose of the appraisal. This provided an opportunity for the list of target villages to be finalized based on district observations in the field.

The target villages selected were distributed among seven of the ten coastal subdistricts of Nias island. The final list of target villages, by subdistrict, is as follows

<i>Subdistrict</i>	<i>Total number of fisherfolk households</i>	<i>Number of selected villages</i>
Tuhemberua	479	Ladara, Botolakha
Gunung Sitoli	478	Afia, Sisarahili Gomo
Gido	145	Fowa
Idano Gawo	155	Bozihona
Teluk Dalam	358	Hilinamoniha, Teluk Dalam Pasar, Lagundhi
Lolowau	126	Hilinamazihona
Sirombu	275	Sirombu

The three coastal subdistricts in which no villages were selected for the appraisal were Alasa, Lahewa and Lahusa. Of these, Alasa subdistrict, situated on the northwest coast, is of very limited importance to fisheries, as there are only two fishing communities, with about 45 resident fisherfolk households. Lahesa subdistrict on the southeast coast is more important, but being difficult of access, it was impractical to include its fishing communities in the appraisal. A more serious omission was a sample of fisherfolk communities from Lahewa

subdistrict, which constitutes one of the most important fishing centres on the island, having approximately 452 fulltime and part-time fisherfolk households. The decision to exclude this area was, again, primarily due to difficulty of access, since Lahewa is accessible from Gunung Sitoli only by boat and the trip is time-consuming. In view of the number of small-scale fisherfolk in this subdistrict, the lack of data on fisherfolk communities therein has to be recognized as an important gap in the general picture of Nias coastal communities obtained by the appraisal.

The breakdown of households eventually interviewed in each village is as follows

<i>Subdistrict Target</i>	<i>Villages</i>	<i>Households interviewed</i>		<i>Total</i>
		<i>Fisherfolk</i>	<i>Others</i>	
Tuhemberua	Ladara	8	8	16
	Botolakha	7	14	21
Gunung Sitoli	Afia	16	1	17
	Sisarahili Gomo	12	0	12
Gido	Fowa	18	2	20
Idano Gawo	Bozihona	8	1	9
Teluk Dalam	Hilinamonihana	21	0	21
	Teluk Dalam Pasar	17	0	17
	Lagundhi	18	0	18
	Hilinamazihona			
Lolowau		(only part-time fisherfolk – no households)		
Sirombu	Sirombu	19	0	19
TOTAL	11	144	26	170

As may be seen from these figures, the appraisal ended up with a more significant concentration on fisherfolk households than had been originally envisaged. In the households listed above, those who owned fishing craft and/or gear, or were involved in fisheries operations, have been categorized as fisherfolk. Many of them, however, own land, and their earnings from agriculture or other occupations may constitute a significant proportion of income.

3. IMPLEMENTATION

The appraisal was implemented in two phases during the period mid-October 1989 to end January 1990.

During the first phase, a format was developed through consultations among BOBP staff, the Appraisal Coordinator and the District Fisheries Service. This format was pre-tested on a limited scale in Botolakha, in Tuhemberua subdistrict, and in Afia, Gunung Sitoli subdistrict. After some adjustments to the format, these two communities and Ladara in Tuhemberua subdistrict were appraised more completely. Prior to this implementation of the appraisal in the field, District Fisheries Service staff supported the Appraisal Coordinator in contacting local officials at subdistrict and village levels in order to ensure their cooperation. The results of this first phase of the appraisal were reviewed and reported on in mid-November 1989.

Based on the experience of the first phase, the second phase was planned in a further eight villages. Modifications were made to the appraisal design, and the work in the field was carried out between early December 1989 and mid-January 1990. As in the first phase, District Fisheries Service officials accompanied the Appraisal Coordinator during the initial contacts with local officials in the target areas and assisted him in the final selection of target villages in Teluk Dalam subdistrict.

In six villages, *i.e.* all three villages in Teluk Dalam subdistrict, Afia in Gunung Sitoli, Botolakha in Tuhemberua, and Hilinamazihona in Lolowau, attempts to obtain basic village statistics, which are normally kept up-to-date by village authorities, were unsuccessful, as such information did not appear to be available. Limitations on the time available for the appraisal made it impracticable for these data to be collected during the appraisal itself.



Homes and boat 'shelters' in the villages surveyed are seen in these two pictures.



Appendix IV
VILLAGE ASSESSMENTS

VILLAGE Ladara
SUBDISTRICT : Tuhemberua
NUMBER OF HOUSEHOLDS INTERVIEWED : 16

LOCATION

32 km north of Gunung Sitoli on the northeast coast of Nias by the main coastal road. Approximately 5 km southeast of the subdistrict headquarters. Good access by 4-wheeled vehicles.

DESCRIPTION

Population **119**
 Households 19
 Fisherfolk households **: 9**
 Village area IOha
 Land ownership Most households own small-holdings.
 Main crops Coconut, cloves, rubber, cocoa, rice.
 Economic Activities Fishing, agriculture, small shops, coffee stalls, food manufacture, cycle repairs, manufacture of *nipa* thatch.
 Distribution Most fisherfolk households have supplementary sources of income. One fisherfolk household with markedly greater assets – two houses, rice, coconut and clove cultivation, small shop, 10 m fishing craft.
INSTITUTIONS : **LMD, LKMD, PKK** and fishermen extension group all in place but inactive.

FISHERIES

Craft All owner-operated 3.5-5 m dugout outrigger canoes. Most fisherfolk families own craft. One plank-built 10 m motorized craft. Two outboard engines owned in the village.
 Gear Predominantly handlines with a few small-mesh gillnets. Two beach seines.
 Species Small pelagics (sardine, anchovy, small tuna, mackerel, half-beak, flyingfish).
 Fishing area Inshore waters close to the village.
 Fishing time 20-25 fishing days/month. Morning and/or evening. Little seasonal variation. (Fishermen involved in fish marketing spend less time at sea).
 Marketing Three fisherfolk transport own catch as well as others' by cycle or motorcycle to Gunung Sitoli or nearby markets.

EARNINGS

Fishing : **c. 2,700 Rp/day** (c.650,000 Rp/year)
Fish sale : **c. 400,000 Rp/year** (additional income for three fisherfolk families)
 Almost all fisherfolk with some additional source of income
 Agriculture : cash-crop small-holding : c. 100,000 Rp/year.
 rice land small-holding : c. 500,000 Rp/year.

PROBLEMS

General

Low earnings, disease (malaria, fevers, respiratory infections), inactive village institutions,

Fisheries

'Traditional' fishing methods.

POTENTIAL

General

Good communications with district capital.

Fisheries

Rich fishing grounds near village.

SOLUTIONS

Fisheries

'Modern' fishing methods.

VILLAGE Botolakha
 SUBDISTRICT : Tuhemberua
 NUMBER OF HOUSEHOLDS INTERVIEWED : 21

LOCATION

Botolakha village is a large village situated approximately 25 km north of Gunung Sitoli on the northeast coast of Nias on the main coastal road. Good access by 4-wheeled vehicles.

DESCRIPTION

Population Not available
 Fisherfolk households c.40 (small minority of total village population).
 Land ownership Most families, including fisherfolk, own small-holdings of 0.25-3.00 ha.
 Main crops Dryland rice, coconut, rubber, cloves, cocoa, sweet oranges.
 Economic activities Subsistence agriculture, cash cropping, a few small traders and shops, fishing (mainly part-time), government employment.
 INSTITUTIONS LKMD, LMD and PKK apparently active. Farmers' and fishermen's groups 'functioning'; but activities unclear

FISHERIES

Craft Fisher.folk households mostly own 3-5 m dugout outrigger canoes
 One 7 m dugout canoe with inboard diesel engine
 2 Suzuki 5 h.p. OBMs owned
 Gear Predominantly handlines, a few small mesh gillnets.
 Species Small tuna, mackerel, some demersal.
 Fishing area Inshore waters near village
 Fishing time Reported 10-20 days/month. Morning and/or evening.
 (data from detailed monitoring of fishing operations in village indicate lower sea time for some fisherfolk : 5-10 days/month).
 Marketing Mostly by fish dealers from Gunung Sitoli using motorcycles. One non-fishing household from village also markets fish.

EARNINGS

Fishing c. 2.500 Rp/day (c. 400,000 Rp/year)
 (motorized craft) c. 5,000 Rp/day
 Agriculture c. 200,000 Rp/year (cash earnings; does not include food for consumption).

PROBLEMS

General

Agricultural pests and diseases, lack of agricultural implements, lack of irrigation, shortage of labour.

Fisheries

Lack of 'modern' gear, 'traditional' methods, diminishing catches, interaction with outside craft.

POTENTIAL

General

Unutilized land for agricultural development.

SOLUTIONS

General

Provision of pesticides, fertilizers, irrigation and equipment for agriculture; training and agricultural extension; credit.

Fisheries

New gear.

VILLAGE : Afia
 SUBDISTRICT : Gunung Sitoli
 NUMBER OF HOUSEHOLDS INTERVIEWED : 17

LOCATION

About 17 km north of Gunung Sitoli on the northeast coast of Nias by the main coastal road. Good access by 4-wheeled vehicles.

DESCRIPTION

Population (Not available)
 Fisherfolk households Minority of total village population
 Land ownership Half (9) the fisherfolk households interviewed (17) own small-holdings of coconut.
 Main crops Coconut
 Economic activities Cash cropping, fishing, small shops.

INSTITUTIONS

LKMD and PKK functioning. Fishermen's group inactive. Active cultural group exists in the community, organizing the performance of traditional dancing and music.

FISHERIES

Craft Most fisherfolk households own 3.5-5 m dugout outrigger canoes. No OBMs.
 Gear Predominantly handlines, with some small-mesh gillnets. One trammelnet owned, which apparently gives significantly better earnings.
 Species Small tuna, small pelagics (sardinella, anchovy), carangids, sea bream.
 Time 20-25 days/month, subject to weather.
 Marketing Most catches sold to dealers from Gunung Sitoli who use bicycle or motorcycle for fish transport. One active fisherman involved in fish sale.

EARNINGS

Fishing c. 2,600 Rp/day (c. 780,000 Rp/year)
 Trammelnet operator 5,000 Rp/day
 Agriculture c. 150,000 Rp/year (small-holdings)
 c. 50,000 Rp/month (seasonal agricultural labour)
 Others Three owners of food stalls/coffee shops reported earnings of 70,000 Rp/month

PROBLEMS

General

Low earnings, lack of capital for investment in enterprises, lack of clean drinking water, agricultural pests and diseases.

Fisheries

Lack of gear, 'traditional' methods, restricted fishing range, lack of engines, lack of functioning fisherfolk organization (particularly for marketing).

POTENTIAL

General

Good communications with district capital; agricultural development.

Fisheries

Underexploited fisheries resources (flying-fish, anchovy, squid).

SOLUTIONS

General

Alternative employment opportunities, 'financial assistance', 'training'.

Fisheries

Motorization, larger craft, new gear, training in 'modern' methods, fish marketing cooperative.

VILLAGE : Sisarahili Gomo
 SUBDISTRICT : Gunung Sitoli
 NUMBER OF HOUSEHOLDS INTERVIEWED : 12

LOCATION

7 km north of Gunung Sitoli on the northeast coast of Nias. Connected by the main coastal road to Gunung Sitoli.

DESCRIPTION

Population : 947
 Households : 182
 Fisherfolk households : 45
 Village area : 600 ha (200 under cultivation).
 Land ownership : 160 households own land.
 Main crops : Coconut, cloves, rubber, rice.
 Economic activities : Cash cropping, fishing, government employment, small trading, carpentry.

INSTITUTIONS

LKMD, LMD and PKK all active. Fishermen's group inactive. Active religious and sports organization, Karang Taruna.

FISHERIES

Craft : 30 fisherfolk households (out of 45) own 4-5 m dugout outrigger canoes.
 2 Suzuki 2 h.p. OBMs owned.
 Gear : Predominantly handlines, some smallmesh gillnet.
 Species : Small tuna, frigate mackerel, trevally, dolphinfish, some snapper, grouper, shark and threadfin.
 Fishing area : Inshore waters near the village.
 Time : 20 days/month. No seasonal variation.
 Marketing : Catches transported to market in Gunung Sitoli and sold there by fisherfolk or sold to buyers using motorcycles.

EARNINGS

Fishing : c. 3,500 Rp/day (c. 840,000 Rp/per year)
 Agriculture : c. 200,000 Rp/year

PROBLEMS

General

Low earnings, lack of assets for investment in new activities.

Fisheries

Lack of gear, lack of motorization, declining catches in inshore waters, interaction with 'outside' craft, instability of fish prices.

POTENTIAL

Fisheries

Flying-fish, snapper, 'rock' fish, shark.

SOLUTIONS

Fisheries

New gear, more gear.

Motorization

Preference for inboard diesel (Yanmar). Reasons: long-lasting, fuel economy.

VILLAGE		Fowa
SUBDISTRICT	:	Gido
NUMBER OF HOUSEHOLDS INTERVIEWED	:	20

LOCATION

17 km southeast of Gunung Sitoli on the east coast of Nias. Well connected to the town by road. Situated 8 km from the subdistrict town.

DESCRIPTION

Population	:	556
Households	:	60
Fisherfolk households	:	40 (declining)
Village area	:	268 ha.
Land ownership	:	Most households own 0,25-1 .00 ha of land.
Main crops	:	Coconut, clove, cocoa.
Economic activities	:	Cash cropping, fishing.

The housing in the village is predominantly of wood and bamboo. All the fisherfolk households interviewed had *nipa* leaf roofing on their houses. Facilities in the village include a market, which is, however, controlled by outsiders rather than local villagers. There is also a Puskesmas, or rural health centre, in the village.

INSTITUTIONS

In contrast to many other coastal villages, the village institutions in Fowa appear to be quite active. Most respondents mention regular activities of the LMD, LKMD and PKK. Fishermen's and farmers' groups are also active in the village, although their coverage is apparently limited.

The village leadership complained of lack of cooperation and awareness among 'certain sections of the community', this apparently being a source of some tension. There are also apparently some problems in the village regarding 'immigrants' from other villages who are not yet legally resident in Fowa.

FISHERIES

Craft	:	Most fisherfolk households own dugout outrigger canoes.
Gear	:	Predominantly handlines, some small mesh gillnets, one trammelnet.

The craft used in Fowa are all small canoes of the 3-5 m range. No craft are reported as being motorized, although Fisheries Service records for 1986 do mention a small number of OBMs in use in Gido subdistrict. While handlining constitutes the dominant fishery, small mesh gillnets are also widely used. At least one trammelnet is also in use in the village.

The main species caught are small tuna, mackerel and other small pelagic species along with some threadfin bream.

Fishermen claim to fish between 15-25 days/month, but a few appear to be only seasonally involved in fisheries. Information obtained regarding marketing is limited, though the presence of a market in the village may indicate that many fishermen directly sell their catches to consumers. One respondent mentioned sales of fish, apparently locally, as an additional source of income.

EARNINGS

Average earnings from fishing are around 2,200 Rp/trip, though the range of reported earnings varies from Rp. 1,500 - 3,000. Following the pattern of other villages where earnings are apparently underestimated and fishing days overestimated, an earning of 2,500 Rp/trip/person for 17 fishing days/month would give an income of 510,000 Rp/year. This lower earning compared to villages further north might explain the reported decrease in the numbers of local fishermen.

Earnings from fisherfolk's land holdings are generally reported as being quite sizeable, the average being 200,000 Rp/year. Agricultural earnings supplement most fisherfolk's incomes. Opportunities for further income from agricultural labour also appear to exist.

Expenditure is largely devoted to daily needs and seems to be in the region of 1,200,000-1,250,000 Rp/year/household. Schooling also absorbs a relatively high proportion of expenditure, averaging almost 8 per cent. This is apparently reflected in the large numbers enrolled in secondary schools.

PROBLEMS

General

The predominant problem, as in many other communities, is lack of assets which can be used to expand enterprises or take up new activities. Almost half the respondents list this as a major concern. In addition, five households interviewed feel that there are few alternative employment opportunities in the village.

Fisheries

By far the most commonly noted problem in fisheries is a steady decrease in catches. Reasons for this decrease are not clear. Three out of twelve respondents who mention this problem identify interaction with gillnetters from 'outside', particularly Gunung Sitoli, as being responsible. One respondent says that there are simply too many fishing craft including local boats operating in the area.

Almost as important is a lack of appropriate fishing gear, which ten respondents identified as a problem. This is often linked to the use of 'traditional' methods. The contradictions between increasing fishing effort when catches are already declining is not apparently realized.

Only five respondents link the poor catches with limitations in range and lack of motorization. Comparatively many respondents identify problems in the post-harvest sector. Six households complain of unstable prices. This appears to be mainly in the form of periodic gluts of fish, leading to low prices. Several of the same respondents see the lack of a marketing cooperative as part of the same problem.

POTENTIAL

General

The principal opportunities available to Fowa fisherfolk seem to be the potential for developing trading enterprises, mentioned by seven respondents, and the exploitation of unused land, which six people identify as a resource. The village leadership feels that the area holds tourist potential. Relatively easy access to Gunung Sitoli is also advantageous.

Fisheries

Several fisheries resources are identified as having potential, the most important being tuna species and snapper. Shark, ray and billfish are also mentioned, as well as sea turtle and dugong which are apparently encountered quite frequently in the area.

SOLUTIONS

General

Altogether, seven respondents feel that the best opportunities for development lie outside capture fisheries, either in small trading activities, including fish dealing, or in agricultural activities. With one exception, these respondents are fairly consistent in seeing limited scope for development in fisheries.

Fisheries

In fisheries, the introduction of new fishing gear together with motorization are seen as the principal avenues for development. No respondents specify the type of gear that might be introduced. Regarding motorization, there seems to be a slight preference for inboard diesel engines and respondents generally seem to be familiar with Yanmar engines. However, several also mention Suzuki OBMs of 2-5 h.p. as suitable propulsion units. While a few fishermen seem to value fuel economy in diesel engines, the most important criteria for choice of engines appear to be durability, local availability and power, in that order. Few respondents appear to link the use of new engines with the introduction of new craft.

Five respondents also felt that the setting up of a marketing cooperative would improve the conditions of fisherfolk.

VILLAGE		Bozihona
SUBDISTRICT	:	Idano Gawo
NUMBER OF HOUSEHOLDS INTERVIEWED	:	8

LOCATION

47 km to the southeast of Gunung Sitoli on the eastcoast of Nias. 10 km northeast of the subdistrict town, Telehosi. Access by land is only by two-wheeled vehicle and is often difficult during wet weather.

DESCRIPTION

Bozihona is a predominantly fishing community of 171 households in a very isolated location. Access is effectively only by sea and there are regular boat connections to Gido. The total population of the village is reported to be 950 individuals.

The village covers a large area of 1500 ha, of which 1090 ha are under cultivation. Five of the eight fisherfolk households interviewed appear to own land and the area available for development is considerable. The interest of fisherfolk in agricultural activities is reported to be increasing. The exact pattern of land ownership for the agricultural area of the village is not clear. Given the relatively sparse population found on the coast of this area of Nias, some land holdings may be larger than the norm.

Housing in the village is predominantly of wood with *nipa* roofing. There appears to be little variation in living conditions among the inhabitants of the village.

While fishing appears to constitute the major source of income for most of the fisherfolk households interviewed, it seems that many fisherfolk in Bozihona are increasingly involved in agriculture. Of the land-owning fisherfolk interviewed, not all appear to be utilizing the land at their disposal.

Another feature of the village is that the number of fisherfolk is said to be decreasing, as is the population of the village as a whole, due to outflow to the town. A *Puskesmas* functions in the village, although many villagers are reported to use a traditional healer, particularly during childbirth.

INSTITUTIONS

The **LMD**, **LKMD** and **PKK** organizations are all in place in the village and apparently active. The **LMD** is involved in the construction of a school and in improving road conditions. **PKK** activities do not seem oriented towards improvement of earnings. A fishermen's group exists in the village, but is not active and has received little or no extension support from local extension staff.

FISHERIES

Fisheries in the village are limited to very small-scale operations using 4 m dugout canoes powered by sail. All fisherfolk appear to own craft and gear. Some households seem to own several craft and ownership of small mesh gillnets as well as handlines is quite common. Fishing methods are limited to handlining and small mesh gillnetting. One beach seine is reported to be operating in the village. No motors are in use, although some fishermen have had past experience of motorization through the Kepres 39 credit scheme during the early 1980s.

Fishing activity is limited to the immediate vicinity of the village. Most fishermen seldom venture more than 5 km from Bozihona to fish. The target species of local fishermen are sardine, flying-fish, small tuna and mackerel, as well as a variety of rockfish, such as grouper and snapper.

Most fishermen claim to spend approximately 20-25 days per month fishing. Marketing of fish is apparently to local dealers who transport it inland and sell it locally, although these arrangements are generally perceived by fisherfolk as being unsatisfactory. No fisherman who was interviewed reported any involvement in fish marketing.

EARNINGS

Fisherfolk report earnings lower than average from fishing in Bozihona. The isolation of the community and distance from the major consumer markets on the island may well affect the prices obtained for fish. Average earnings/fishing day are reported as in the region of Rp. 2,000. At 20 days fishing/ month this would yield an income of approximately 500,000 Rp/year.

Those fisherfolk owning land and utilizing it appear to obtain reasonable additional income as well as food for home consumption, as land holdings are extensively devoted to food crops as well as cash crops. Reported income from agriculture for the three households interviewed who own land is about 250,000-300,000 Rp/year. Land holdings seem to average 1-2 ha.

Reported average expenditure is also appreciably lower than in many other villages and reasonably consistent with the reported earnings. The average figure seems to be between Rp.900,000-1,000,000. Proportionally less expenditure seems to go on basic daily needs such as food. This perhaps indicates more of a subsistence orientation towards both fishing and local agricultural activities and a more limited circulation of cash in the village economy. Expenditure on schooling is also very limited.

PROBLEMS

General

Apart from the low earnings and lack of productive assets mentioned by most respondents, the isolation of Bozihona is perceived by many villagers as a major constraint on its development. The village leadership identifies the increasing outflow of villagers towards the town as another problem. In addition, village unity and cooperation in addressing development problems is seen to be limited. Some skepticism among fisherfolk regarding the usefulness of community action is apparently due to negative past experience.

Fisheries

Problems perceived in fisheries by local fisherfolk fall essentially into two categories. First, in regard to technology, the lack of motorization is seen to limit the fishing range and access to certain resources. All eight respondents specify lack of engines as a priority problem. Limitations in the fishing gear currently used are also mentioned by some fisherfolk.

The second major problem area in Bozihona seems to be in marketing. There appears to be a real problem, with price fluctuations during seasonal gluts of fish. Even finding a buyer is referred to as being difficult at times. In this regard, some fishermen lament the lack of a fishermen's cooperative in the village.

POTENTIAL

General

Given the abundant underutilized land in the area, it is not surprising that agricultural development is seen by many respondents as having potential. In addition, certain individual skills, such as carpentry, are mentioned by certain respondents.

Fisheries

Reports that fish catches are actually increasing as fisherfolk move away or take up agriculture seem to indicate considerable fisheries potential in the area. Respondents were not, however, very forthcoming regarding species which could be further exploited. Resources of rockfish appear to be abundant though requiring motorization to enable their exploitation. Billfish, mackerel and small pelagic species are also mentioned.

SOLUTIONS

General

Beyond the opening up of agricultural land, the provision of more intensive extension support in agriculture is seen as necessary by several respondents. The improvement of communications with the village, through the completion of the road currently under construction from Bozihona to Tetehosi, is widely hoped for.

Fisheries

The most crucial input required in fisheries, according to almost all respondents is motorization of craft. Fisherfolk appear to appreciate the requirement for new craft to maximize the benefits of motorization. Preference regarding engine types appears to be divided between Yanmar diesel IBMs and Suzuki OBMs, although the assessment of the h.p. required is more realistic in Bozihona than in other villages such as Fowa. Various factors are regarded as important in engine choice, durability and easy maintenance being commonly regarded as important.

Two respondents also hope for the establishment of a more active fishermen's group. However, the exact role of such a group in assisting fisherfolk is not specified or clear.

VILLAGE		Hilinamoniha
SUBDISTRICT	:	Teluk Dalam
NUMBER OF HOUSEHOLDS INTERVIEWED	:	21

LOCATION

Approximately 15 km northeast of Teluk Dalam on the southeast coast of Nias. Accessible from Teluk Dalam by 2-wheeled vehicle along a very rough coastal road that is subject to sea erosion.

DESCRIPTION

A large Christian community, entirely devoted to fishing activities and with very limited land available for agricultural purposes, live here. The area around the village is made up of rocky calciferous uplands which descend directly to the seashore, leaving little land suitable for cultivation. The seashore is also heavily eroded and landing places for fishing craft are very limited.

A relatively large proportion of houses in the village are made of cement with zinc roofing, while others use combinations of wood, cement and *nipa* thatch.

A few fisherfolk own very small plots of land where they cultivate coconut and some cloves. Few other economic activities are reported in the village. A few wives of fishermen are involved in fish vending and several others in cultivating the family smallholdings, but most households appear to depend almost entirely on fishing for their livelihood.

The average family size is apparently somewhat above the norm in Hilinamoniha, being 6.5/household among the 21 interviewed.

INSTITUTIONS

While the standard village institutions, such as LKMD, LMD and PKK, are all in place in the village, their activities appear to be occasional and not oriented towards developmental ones. The LMD is described as inactive.

FISHERIES

Hilinamoniha fisherfolk generally own their craft, which are all dugout outrigger canoes. The usual size for canoes in this village seems to be marginally larger than in most other locations, the average canoe size being around 5 m. All canoes in the village are sail-powered and no engines are in use.

The only fishing gear used in the village appear to be handlines and harpoons. The latter are used for catching lobster and rockfish in reef areas along the shoreline.

Hilinamoniha is notable for the range of species mentioned by fisherfolk as frequently caught. Besides the small tuna, mackerel and flying-fish frequently targeted by small-scale fishermen almost everywhere on Nias, varieties caught include snapper, grouper, various carangids, scad, bilifish, shark and pornfret.

Most fishermen appear to fish in an area about 5-7 km from the village, described as 'three hours' sailing'. Some also practise harpoon fishing from the rocks lining the shore around the village.

Almost all fishermen reported their average monthly fishing days to be around twenty. No fishermen appeared to be involved in fish marketing, although other household members sometimes market catches from the village.

EARNINGS

Fisherfolk report fishing earnings of approximately 2,500 Rp/day. There seems to be a fairly consistent relationship between amount of gear (handlines) owned and reported earnings. Several fishermen who own ten handlines claim to average up to 5,000 Rp/day. Most fishermen apparently use about five handlines at any one time and report an average of Rp.2,500. This would yield an average income of approximately 600,000 Rp/year. Given the lack of agricultural land to support subsistence farming and the lack of any other income-generating opportunities, this figure seems rather low. Fisherfolk reported much higher than normal expenditure on repair and maintenance of fishing craft. This may reflect the difficult and rocky conditions encountered in the area for beaching craft.

Those who earn some additional income from the land report maximum income of 120,000 Rp/year. Reported expenditures is in the region of 1,100,000 Rp/ household/year and certainly exceeds reported incomes. Levels of schooling appear to be very low to judge from the expenditure allocated on education.

The discrepancies between expenditure and income noted in Hilinamoniha may be due to under reporting of other income-generating activities.

While Hilinamoniha itself has little land at its disposal, other villages further south have extensive cultivated areas and irrigated rice fields which may provide opportunities for employment to people from nearby villages, including Hilinamoniha. On the other hand, rather difficult access from the village to fish markets in nearby Teluk Dalam, although the distance is not far, may adversely effect the prices obtained for fish.

PROBLEMS

General

Three serious problems identified by respondents are: the lack of cultivable land around the village, the lack of alternative employment opportunities, and a lack of capital for investment in new activities.

It is also apparent that this village is extremely 'traditional' in the sense that old customs and beliefs seem to play a greater role in people's lives than in many other coastal villages. The extent to which this might affect people's receptiveness to new ideas is not clear.

Fisheries

No less than 76 per cent of the respondents state that their catches are diminishing. This seems to be attributed as much to overfishing by local fishermen as to activities of outside craft. Interaction with gillnetters certainly takes place, but presumably affects only certain fishing areas utilized by fishermen from Hilinamoniha. Several respondents state that fishing grounds near the village are being depleted, but other areas further off still have potential.

A lack of diversified fishing gear is also regarded by some as a limitation. However, the most important technical problem faced by fisherfolk is stated to be the short range of craft and lack of motorization. Marketing of fish does not seem to pose any great difficulties in the village.

POTENTIAL

General

Fisherfolk in Hilinamoniha were unable to identify much in the way of unexploited physical resources outside fisheries. Few fisherfolk appear to possess skills, apart from fishing, which could be exploited.

Fisheries

Fishermen in the village seem to have a very clear image of themselves as 'professional' fishermen and this is reflected in the identification, by many of them, of their fishing skills as an important resource.

In terms of fish species seen as having potential, the most frequently identified ones are a variety of species of rockfish, particularly snapper.

SOLUTIONS

General

Given the limited land-based resources available to people in Hilinamoniha, it is not surprising that few solutions are envisaged through the development of activities outside fisheries. Some would like to see access to agricultural land opened up, but possibilities for this are very limited.

Fisheries

The most important single input in fisheries, overwhelmingly identified by 75 per cent of respondents, is motorization of craft. A need for new craft is mentioned by some fishermen, but increased mobility is generally seen as the key requirement for fisheries development in the area.

Most respondents identified Yanmar diesel inboard engines as the most appropriate propulsion unit. The qualities most valued were durability and power. The latter was reflected in the suggestions that suitable engines be in the range of 12 h.p.

Responses to enquiries about motorization indicate a little familiarity with the use of engines. Aspects such as fuel economy were given rather low priority.

Among the OBMs mentioned, Yamaha seems to be the brand most familiar to local fishermen.

VILLAGE Teluk Dalam Pasar
SUBDISTRICT : Teluk Dalam
NUMBER OF HOUSEHOLDS INTERVIEWED : 17

LOCATION:

An urban community located on the seafront area of the town of Teluk Dalam on the south coast of Nias. Teluk Dalam is the most important town and harbour on the island after Gunung Sitoli and is the centre of commercial activity for the southern part of the island. Regular bus services run between the town and Gunung Sitoli, the 160 km trip taking about six hours. Direct boat services also connect Teluk Dalam to Sibolga on the Sumatera mainland. Kepulauan Batu to the south and Padang in West Sumatera.

DESCRIPTION

Teluk Dalam Pasar constitutes the principal settlement of fisherfolk in the town, but is spread along the seafront outside the main urban area. As would be expected in an urban setting, the community is a mixture of fisherfolk, other professional groups and immigrants to the area from other surrounding rural communities who have come to Teluk Dalam for work and education. There is no agricultural land in the village area although some families own coconut trees.

In spite of its urban setting, the standard of housing in the village is quite low. There is a predominance of bamboo and wooden structures, many with earthen floors. Relatively few families have built with cement or brick.

While few of the respondents reported additional incomes outside of fishing, many household members are clearly working in other sectors, including small-scale food manufacture and sale of this produce by women.

INSTITUTIONS

Of the formal village institutions, the LKMD and LMD are said to be active, although participation by the community seems to be limited. No fishermen's group is reported in the village.

FISHERIES

The location of the village in an important trading and fishing centre naturally give rise to a rather different pattern of fisheries and employment than that encountered in other villages surveyed. Teluk Dalam, besides being a trading port, is also developing as a centre for small to medium-scale fisheries similar to those encountered in Gunung Sitoli. The ownership of these fisheries is in the hands of local entrepreneurs, who are generally not from the fisherfolk families but are small traders who have invested in fishing.

While labour opportunities do exist for fisherfolk in these fisheries, it seems to be seasonal and uncertain. Many of the small gillnetters and longliners operating out of Teluk Dalam are crewed by fishworkers usually from mainland Sumatera. Teluk Dalam also serves as a base for fishing craft from Sibolga, Padang and even further afield, which are involved in handlining, longlining, trawling and various other specialized fisheries that take place in the area.

The majority of local fisherfolk interviewed still rely predominantly on traditional fishing methods using dugout outrigger canoes of 3m length. Some 5m plank-built craft are being used, particularly with outboard engines. Although more outboard engines are encountered than in many other locations, most craft are still sail-powered.

Handlining and small-mesh gillnetting are the main fishing methods in use, although at least one fisherman is experimenting with a small longline. One owner of three larger fishing vessels was also contacted. His 4GT and 8GT craft are both currently involved in bottom longlining for oil shark, while his larger 1SGT boat is doing multiday handlining operations.

The main species reported by fishermen are small tuna, Spanish mackerel, billfish, shark and garfish, along with a variety of rockfish such as snapper and carangids.

The average fishing time reported is 20 days/month. No fisherfolk seem to be involved in fish marketing.

EARNINGS

Fisherfolk's earnings from marine fishing activities are reported as being in the region of 3,000-3,200 Rp/fishing day. Yearly income is probably in the region of 770,000 Rp/year. Two fishermen owning 6 and 8 h.p. outboard engines reported considerably increased net earnings of 5,000-7,500 Rp/fishing day in spite of the high petrol costs apparently incurred by these engines.

The very imprecise information provided by the one boat-owner interviewed makes it difficult to calculate the earnings of fishing labourers working on larger craft.

The expenditure reported by fisherfolk in Teluk Dalam is marginally higher than that in other villages, as would be expected given the lack of agricultural land for subsistence needs. The average annual expenditure seems to be in the region of Rp.1,350,000, the high figure being mainly due to higher expenditure on food. Schooling consumes only about 4 per cent of annual expenditure.

PROBLEMS

General

Few problems outside of fisheries are highlighted by those interviewed in Teluk Dalam. Lack of capital to invest in improved fishing operations is mentioned by four respondents.

Fisheries

Two problems seem to dominate fisherfolk's thinking in Teluk Dalam. The main difficulty faced is claimed, rather surprisingly, given its location in an urban centre, to be in marketing. Twelve respondents mention lack of stability in prices for fish as being an important problem, often linked to the lack of a regular buyer. Several fisherfolk feel that this problem is, to some extent, due to the lack of a cooperative or fishermen's organization to take care of marketing.

The other main problem is diminishing catches, blamed on both overfishing by local fishermen and outside vessels. The activities of gillnetters and purse-seiners, the latter from Sibolga are particularly mentioned.

A lack of suitable gear to exploit available fisheries resources, along with too short a fishing range to reach new fishing grounds where more commercial species are thought to be available is also felt to be a limitation by some fishermen.

A small number of respondents also feel that fisherfolk are not unified enough to enable them to act collectively to protect their interests.

POTENTIAL

General

The good communications between Teluk Dalam and the mainland is felt by several fisherfolk to be a major advantage for future development. It is also noted that there is no shortage of manpower to take up new activities in the area.

Fisheries

As in other fishing communities in the southern part of Nias, fisherfolk in Teluk Dalam appear to identify themselves as skilled fishermen and regard this as an important asset. Interestingly, while others regard marketing as a problem, at least two respondents feel that there is good market potential in the area for fish, particularly in export.

Fisherfolk interviewed were not very forthcoming regarding particular species which might hold potential for increased exploitation. Scope for shark fisheries is mentioned, along with various small pelagic species such as fusilier, rainbowrunner and sardine.

SOLUTIONS

General

Those interviewed seem to foresee little scope for development outside fisheries. Alternative employment is apparently not regarded as a serious alternative.

Fisheries

In fisheries, the most important avenues for change are seen to be in the post-harvest field. Some kind of marketing cooperative is felt to offer a solution to problems of price instability, and many respondents feel that there is considerable scope for fish processing. Given the current imports of dried fish to Nias from the mainland, this seems to be a reasonable option.

Several fishermen also suggest the introduction of new, 'modern' gear to increase productivity of small-scale fishing operations.

VILLAGE Lagundhi
SUBDISTRICT : Teluk Dalam
NUMBER OF HOUSEHOLDS INTERVIEWED : 18

LOCATION

Lagundhi is located 12 km west of Teluk Dalam on the south coast of Nias. The village is connected by road to Teluk Dalam.

DESCRIPTION

A large, predominantly Muslim community live in this village located by a sheltered bay and backed by extensive cultivable lands. The edges of the bay have some mangrove and nipa swamp areas. The inhabitants of the village are mixed fisherfolk and farmers, with most households owning some land. Housing in the village is predominantly of woven bamboo, wood and nipa thatch.

Lagundhi is developing as a tourist area, attracting a small but steady stream of western tourists who come for the beach, surfing and to use it as a base for trips to nearby ancient Nias villages. Numerous small 'losmen', or guest houses, have sprung up to accommodate these visitors. Not many, however, appear to be owned by fisherfolk.

Most fisherfolk households appear to divide their labour between agriculture and fishing. Average landholdings range from small plots of 0.1 ha of land suitable for rice to as much as 3 ha of plantation land devoted to cloves and coconut.

INSTITUTIONS

While formal village institutions, such as the LKMD, LMD and PKK, are all reported to be active in the village, it is apparent that the fisherfolk do not participate fully in their activities.

A fishermen's group also exists in the village, but is not active due to reported disagreements among its members.

FISHERIES

Fishermen in the village generally their own 4-5 m sailing canoes, which are used for handlining. Some fishermen also own drift gillnets. Although none of the respondents reports owning an engine, several small outboard engines are known to be operating in the village.

A wide range of species are reported as being caught by local fishermen. Among pelagic species, tuna, Spanish mackerel, mullet, flying-fish, scad, sardine, halfbeak, pomfret, and billfish are reported. Among demersal species, snapper, carangids, grouper, seabass, and some shrimp are taken.

Most fishermen seem to fish regularly up to about 22 days/month and a significant number make two fishing trips/day, morning and evening. Although most fisherfolk households also own land, it generally appears that those members of the households who fish do so full-time, while other family members concern themselves with agricultural activities.

No fisherfolk mentioned involvement in marketing of fish. However a small market is available in the village and provides an outlet for catches. Marketing there is apparently carried out by family members there.

EARNINGS

Average reported earnings from fishing are about 2,500 Rp/day. A significant number of fisherfolk involved in handlining and making two fishing trips per day consistently reported higher earnings of about 3,000 Rp/day. This would give an income range (at the reported frequency of fishing) of between 660,000 and 800,000 Rp/year.

Reported earnings from agriculture, averaging about 80,000 Rp/year, seem low, given the relatively large landholdings of many fisherfolk. However, several fisherfolk own only small plots of paddy land, apparently used for subsistence agriculture, and therefore earn very little by way of cash income.

Only one respondent, who owns a small guest house, reports any earnings from tourist-related activities. However, direct observations indicate that many fishermen boat-owners do earn some additional income from transporting tourists to and from surfing locations and from other small tourist services. Tourist traffic is still quite limited and the contribution to fisherfolk incomes may not be very significant, but it could seem that some income sources may not have been reported.

Reported daily expenditure is also somewhat high due to consistently high estimations of amounts spent of food. This figure may well be overestimated since most fisherfolk have access to land for subsistence crops. The average family size among respondents is actually somewhat lower in Lagundhi than in other villages studied. The reported figure of about 1,200,000 Rp/year can be considered a maximum figure.

PROBLEMS

General

No particular problems are mentioned in the village with regard to agricultural production or general conditions. It is felt that fisherfolk in the village do not participate fully in the various village decision-making forums. A problem of debt among fisherfolk is also mentioned, this being the only village among those investigated where the problem is mentioned. Shortage of capital for investment in new enterprises is referred to by many respondents as a limitation.

Fisheries

Fisherfolk in Lagundhi seem to feel that the fisheries resource situation in the area is deteriorating. This is attributed mostly to an excessive number of small-scale fishermen, although the operations of larger craft from other areas is also seen as responsible.

On the other hand, fisherfolk seem to feel that exploitable resources exist but are not accessible using existing craft and gear. Lack of suitable fishing gear and restricted range of operations, due to lack of engines, are frequently identified as important problems.

Lagundhi is one of the few villages investigated where some fishermen also mentioned distinct seasonal variations in fishing. Several respondents indicated that fishing operations are restricted during the period of the west monsoon.

In post-harvest issues, the lack of an organized and regular buyer seems to be the principal problem, giving rise to unstable prices. Several fisherfolk also mention the lack of ice supply as a restriction, this being the only community where this factor is mentioned.

POTENTIAL

General

It is clear that many fisherfolk in Lagundhi see the development of land-based enterprises as an important avenue for development. A majority of respondents identify existing agricultural land as an important resource at their disposal. Several respondents obviously regard themselves as skilled in both fishing and farming and would like to see both activities develop side-by-side. In spite of the tourist developments in the area, only three respondents seem to regard this as having potential for the improvement of their own conditions. This would seem to indicate that the fisherfolk are not taking part in the development of tourist services in the community.

Fisheries

Lagundhi fishermen identify several fisheries resources which might have scope for further exploitation. In particular, they seem to be familiar with resources of shark, flying-fish and some other small pelagic species. Billfish potential is also mentioned.

SOLUTIONS

General

As indicated above, development of agriculture, through better training and extension, is regarded as a priority for development. One respondent, the only one in any of the communities under consideration, mentioned that the encouragement of savings among fisherfolk would assist their development.

Fisheries

The preferred option in fisheries development is overwhelmingly motorization of craft to enable access to new fishing areas and resources. A strong preference for outboard motorization is indicated, the Yamaha 5 h.p. OBM apparently being the engine of choice. The main reason for this is apparently its availability on the local market. It is also regarded as a long-lasting engine. Several respondents indicated a familiarity with Yanmar inboard diesels as a viable option. The need for new craft is apparently not regarded as a priority issue.

Fish processing as a means of overcoming current marketing problems is also considered important. Given the lack of any ice-making facilities in the area, this may be a viable option.

VILLAGE

Hilinamazihona

SUBDISTRICT

:

Lolowau

LOCATION

About 50 km northwest of Teluk Dalam on the southwest coast of Nias. Approximately 30 km to the south of the subdistrict capital of Lolowau. Connected by unpaved road to both locations.

DESCRIPTION

A primarily agricultural community located along the open beach and spreading over the immediate hinterland of the west coast. This village has been selected as the planned location for a major tourist development in the future and its inclusion in the appraisal was at the request of the local Planning Board, BAPPEDA.

This village is rather remote from any centre and the level of education is generally very low.

Agriculture is the principal activity of the villagers, with extensive land under rice cultivation and plantations of clove and coconut. Fishing is a very limited; it is a supplementary activity for a few households in the village and, so, individual household investigations were not carried out during the appraisal.

INSTITUTIONS

The formal institutions in the village, such as the LMD, LKMD and PKK, seem to play an active role in village development activities.

FISHERIES

Very limited fisheries activity takes place in Hilinamazihona. It is limited to basic handling from small sail and paddle-powered dugout canoes. People involved in fisheries in the village appear to have little expertise or knowledge about fisheries and are mostly agriculturists who have taken it up to supplement the household's diet, rather than as an income-generating activity.

No one appears to have any familiarity with any kind of boat engine.

EARNINGS

No information is available on earnings or expenditure of villagers.

PROBLEMS

The principal problems faced in the village appear to arise from its isolated location. This situation may improve as the planned tourist development begins to function. While the village is situated on the main road and bus route from Teluk Dalam to Gunung Sitoli, the road is unmetalled, and in poor condition and has little traffic.

The agricultural methods used are apparently very traditional and yields are very low.

POTENTIAL

Beyond the existing potential of the area as a tourist location, there is much undeveloped land in the area which could be used for agriculture.

Fisheries potential may also exist in the area, particularly in the Kepulauan Hinako which are relatively nearby. However, all landings are on an open beach exposed to surf which would be difficult to negotiate using existing types of craft. The remote location would also pose major problems in marketing the fish.

SOLUTIONS

An important role was suggested by villagers for agricultural extension agents to improve agricultural methods in the village.

Some people felt that the introduction of motorized fishing craft might facilitate further development of fisheries in the area.

VILLAGE Sirombu
SUBDISTRICT : Sirombu
NUMBER OF HOUSEHOLDS INTERVIEWED : 19

LOCATION

90 km southwest of Gunung Sitoli and about 80 km northwest of Teluk Dalam on the west coast of Nias. Connected to both towns by road. The fishing community is located about 2km from the centre where the subdistrict headquarters is situated.

DESCRIPTION

A mixed Muslim and Christian village of 123 households and a total population of 630. Just under half the households in the village earn their living primarily from fishing. Others are farmers, traders and government workers. Sirombu is the only major centre of trade on the west coast of Nias. As such, it is an important service centre for central western Nias and the Kepulauan Hinako, about 20 km off the west coast. Sirombu is connected by regular boat services to the Kepulauan Hinako and to Sibolga *via* Teluk Dalam. The shelter offered by its wide bay is also used as a base by some outside fishing craft involved in handlining, longlining, trawling and purse-seining in the west coast area. While 35 households are reported to be those land-owning farmers, only two of the fisherfolk households interviewed reported any landholdings. Fisherfolk in the village appear to be specialized and relatively more 'professional' than in many other coastal communities in Nias.

Housing in the village is predominantly of wood, with nipa thatching. Many of the brick and cement structures in the commercial area of the village were destroyed in a recent fire and are slowly being rebuilt.

Several traders play an important role as middlemen for local produce. Usually such traders are not specialized but appear to handle various commodities, including some fisheries products.

INSTITUTIONS

While formal village institutions, such as the LKMD, LMD and PKK, are in place in the village, the participation of fisherfolk in such institutions seems to be minimal.

FISHERIES

Fisheries in Sirombu is particularly notable compared to other areas of Nias, as most small-scale fishermen own OBMs, although it would appear that many of these are not operational. Another notable feature is the high proportion of fisherfolk households not owning their own craft. The craft used in the area are also generally larger than in other areas, being in the 5-7 m range. The higher price of these units may explain the number of fishing labourers working on other people's craft. The OBMs used are mostly Suzuki 2 or 5 h.p. Twentythree small craft were reported to be operating from the village, although numerous other nearby communities have fishing craft. Thus the subdistrict total for small craft is over 200.

Two larger craft are also used, powered by Yanmar and Kubota diesel inboard engines. In both cases, these craft represent second boats for their owners, supplementing their traditional outrigger canoes. Handlining is generally the main fishing method among small-scale fishermen. The species caught off Sirombu show a greater predominance of demersal species compared to other areas. Among pelagic species, scad mackerel dominates catches although some little tuna, Spanish mackerel and billfish are also taken. Otherwise, a variety of rockfish, such as snapper, grouper and carangids make up the bulk of catches.

The fishing grounds exploited by Sirombu fishermen are consistently identified as located around islands in the Hinako group, approximately 7-8 nautical miles from Sirombu.

Fishermen report fishing days in the region as 15-20 days/month.

Most fish, except for shrimp and lobster, seems to be sold on the local market. While marketing facilities exist in Sirombu, facilities for proper handling of fish are limited. A considerable amount of fish is dried in the village.

EARNINGS

Reported earnings from fishing in Sirombu are relatively high, about 3,000 Rp/trip. The generally higher income may be the result of motorization, but it is noticeable that the earnings of motorized small craft on the northeast coast of Nias, based on detailed monitoring of catches, seem to be

considerably higher. Under-reporting of earnings may be a factor, although the problems encountered in marketing of fresh fish from Sirombu is probably the single most important limitation on fishermen's earning capacity.

Average fishing income would be in the region of 600,000-700,000 Rp/year as reported. Very few fisherfolk households appear to have other sources of income apart from fishing. One respondent earns extra income as an outboard engines mechanic.

Reporting of expenditure in the community is very varied and rather inconsistent. Estimates range from 1,000,000 Rp/year to over Rp.3,000,000. Lack of agricultural land at the disposal of fisherfolk might push up their expenditure on food, and the remoteness of Sirombu may effect other prices in the village. An average yearly expenditure of Rp.1,500,000 is reported. It seem likely that respondents failed to report income generated by women in their households.

PROBLEMS

General

Low earnings and consequent lack of assets to reinvest in productive activities is the main problem outside of fisheries identified by respondents.

Fisheries

A high proportion of respondents in Sirombu identified interaction with purse-seiners and trawlers and its effect on their catches as a major problem. Identification of outside fishing effort as a cause seems to be clearer here than in other locations in Nias.

The other major difficulty faced by local fishermen is in marketing. The relatively remote location of Sirombu certainly limits the marketing possibilities, and fishermen complain of low prices received for their catches as a result. It appears that outside buyers do not come to Sirombu, and the one trader who sends frozen fish in small quantities out to Teluk Dalam handles only shrimp and lobster, which are not readily accessible to small-scale fisherfolk.

Fishermen have also experienced difficulties with their outboard engines, many of which are not operational. Spare parts and proper servicing are apparently difficult to obtain in Sirombu. As a result of technical problems with engines, many fishermen's range of operations is limited.

POTENTIAL

General

No non-fisheries potential is identified by Sirombu fisherfolk.

Fisheries

The principal resources identified are shark, billfish and, to a lesser extent, tuna. Notably, fishermen in Sirombu express greater awareness of large pelagic resources in the offshore area. It is generally felt that, in spite of reductions in catch, rich resources of fish exist, given the proper gear and mobility for exploiting them.

The familiarity of most fisherfolk in the village with engines and the problems and potential of motorization is, in itself, an important resource.

Transportation and communications to Sirombu are steadily improving. A more direct road link, which will considerably reduce the transit time to Gunung Sitoli, is awaiting completion.

SOLUTIONS

General

Respondents identified possible improvements only in the fisheries sector.

Fisheries

The replacement of engines is mentioned as a priority step by most respondents. Past experience seems to have turned fishermen in Sirombu against outboard motorization as an option and most now regard inboard engines, such as Yanmar, as a more suitable solution. Durability and fuel economy are seen as the major advantages of such engines.

Some scope for improvement of gear and introduction of new gear is also seen, as well as potential for improved processing of fish. Since much fish is even now dried in the village, due to the lack of ice, it is perhaps surprising that more respondents do not mention this last option.

In marketing, more emphasis is given to the need for a dealer to handle fishermen's catches or the setting up of a marketing organization.

Government intervention to control illegal trawling in the area is also mentioned.



Life in the villages surveyed

