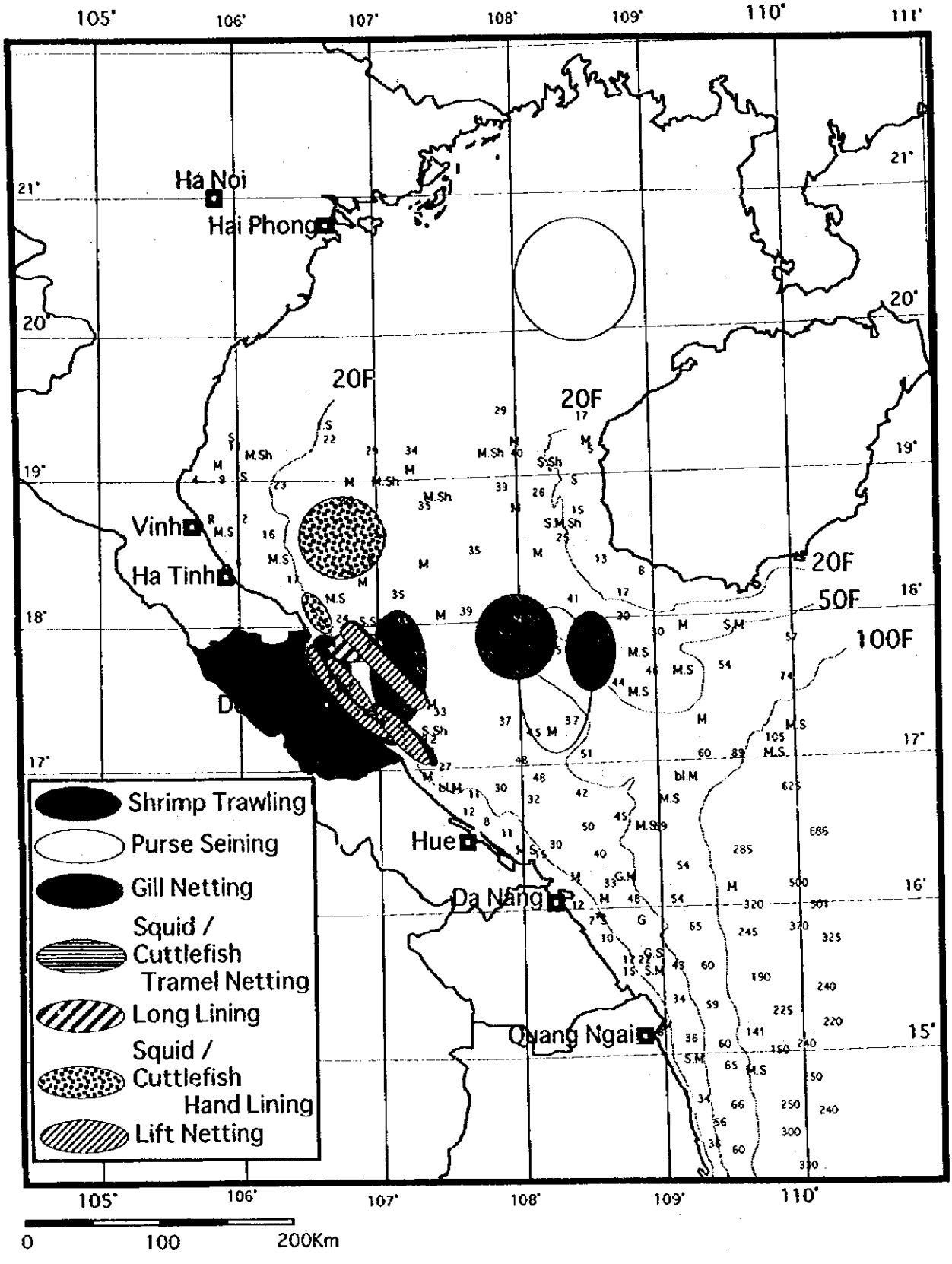

Fig. 6-48 Fishing Ground Distribution by Fishing Type in Quang Binh Province

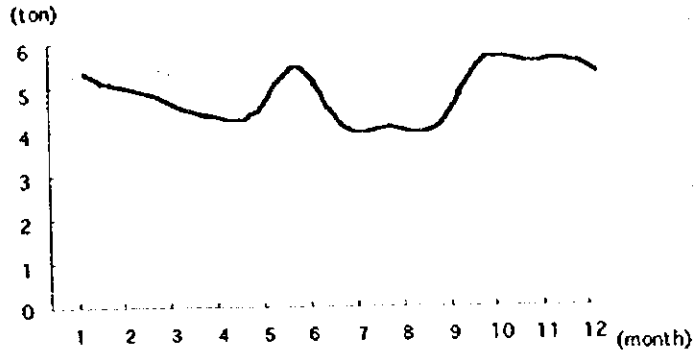

Fig. 6-49 Seasonal Catch Fluctuation per unit of Gill Netting

affinis), king mackerel, and bonito in fishing grounds extending 110 km offshore from Dong Hoi to tiny Con Co Island.

The seasonal change in the per boat production is shown in Fig. 6-49. In October, as more river water flows into the sea, reducing the transparency of sea water, fishers start using drift gill nets at night on 3 - 5 days fishing trips. A monthly average of 5.6 t are caught, with species including Eastern little tuna 67 %, Indo-pacific mackerel 7%, bonito 6 %, together with a combined 20% composed of barracuda, king mackerel, frigate mackerel, and hairtail. In summer, on the other hand, production sharply declines as fish recognize standing nets in more transparent water so many fisher stop using drift gill nets and convert to squid angling. Fishes caught are Eastern little tuna (50%), Indo-pacific mackerel (10%), bonito (30%) and others (10%). Gill netters also do some squid angling while operating drift gill nets at night, and they exclusively operate squid angling from April to June when the drift gill net operation is insufficient due to water condition. They operate in waters around Con Co Island from July to August, and move further offshore from October to February.

Unfortunately, data on fishers using smaller gill nets, such as the bottom gill net and trammel net, are not inadequate for analysis, but it is apparent that an overwhelming number of gill netters, which accounts for as much as 43% of the total number of fishing gear in the province, are small-scale operators using

a combination of seasonally changed gear types. They operate in coastal waters and have a much lower productivity than drift gill netters.

6-4. Lift Net Fishery

There are 514 units of lift net in Quang Binh Province in 1995. The 60% of them are now operated by one boat, having been converted from the 4-boat operation (4-boat lift net) in the last few years. Only 40% remain in the 4-boat mode of operation. Their fishing season is from March to October when the sea is calm. But the gear is usually changed to shrimp trawl, squid hook and long-line as the sea becomes stormy from November to February (Fig. 6-50).

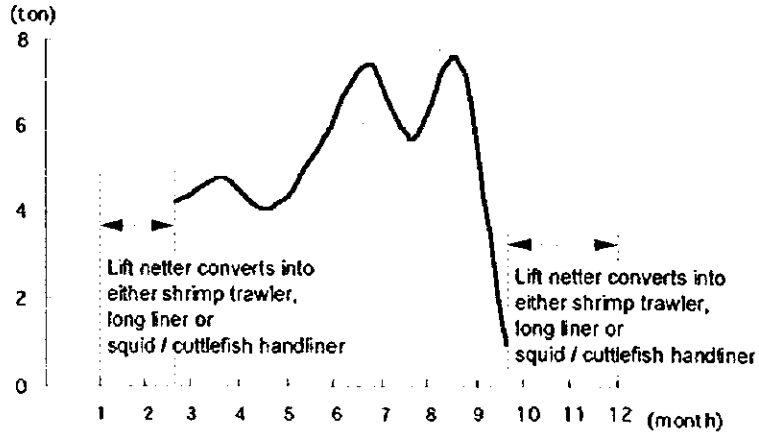

Fig. 6-50 Seasonal Catch Fluctuation per unit of Lift Netting

In the early fishing season of March to June, the monthly catch from the lift net fishery is in the range 4.1 - 5.5 t, with species taken including commersonis anchovy (40%), herring (20%), yellow tail round scad (40%). In the peak fishing season from July to September production increases to 5.5 - 7.5 t; fishers told us that occasionally too much fish is caught to be brought to port. The catch is composed of a higher percentage of commersonis anchovy (55%), herring (30%), and yellow tail round scad (15%). The fishing grounds are located 60 - 110 km from Dong Hoi City in the direction of 45 to 100 degrees.

The further offshore fishers operate the larger the expected catch. But there is a limit from which they can return with fresh fish without ice. Approximately 110 km from the coast, which is equivalent to 9 hours sail at 6.5 knot per hour, as local fishers describes, is about the furthest fishing ground they reach at present.

Fishers sell basically fresh fish during the dry season, with the unsold balance being sun-dried. In the rainy season, they process fish at home to sell nuoc mam after 5 - 6 months.

6-5. Trawl Fishing

The Quang Binh Province has 2,453 registered shrimp trawlers and pair-trawlers. Based on data derived from the field survey, many are apparently are operated only as a secondary fishing in the off-season for lift net and gill net fishing. Setting sail in evening and returning next morning from February to April, slightly less than 200 kg of shrimp is caught in an average night's work. The fishing ground is located in 15 km offshore from Dong Hoi, in waters 13 - 35 m deep. Species caught are smooth shell prawn(50%), green tail prawn (5%), black tiger prawn (5%), Western king prawn (7.5%) and others (32.5%).

Some fishers target bottom fish by pair trawling from November to February. The fishing ground is areas of about 40 m depth off Dong Hoi. This operation is carried out within a day and in daytime. The catch is composed of goatfish (60%), Silver pomfret (22%), Lizardfish (11%) and by-catch (7%), which is not abandoned in the sea.

Fig. 6-51 shows the seasonal change of estimated catch by an average trawler powered with an engine of less than 20 h.p.. It catches per month 0.3 t of shrimp, 0.3 t of food fish and 0.75 t of by-catch from December to February. Fig. 6-52 shows the seasonal change for an average trawler with an engine of over 20 h.p. which catches per month 1.5 t of shrimp, 1.5 t of food fish and 0.75 t of by-catch from November to March. The estimated annual catch from trawl fisheries in Quang Binh Province is 4,000 t, of which 1,800 t is caught by trawlers of less than 20 h.p., and 2,200 t from those over 20 h.p.. The ratio of

by-catch is estimated at 30% (Fig. 6-53), and the ratio is higher for smaller boats.

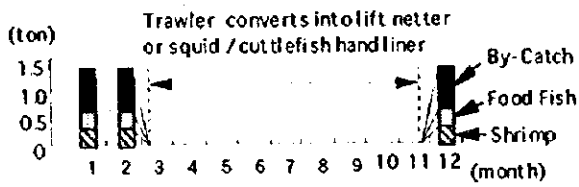

Fig. 6-51 Seasonal Change of Catch Composition per unit of Trawler (Smaller than 20 h.p.)

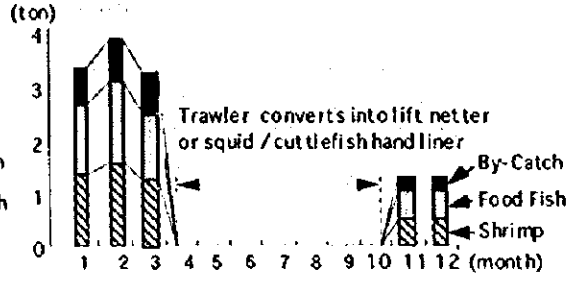

Fig. 6-52 Seasonal Change of Catch Composition per unit of Trawler (Larger than 20 h.p.)

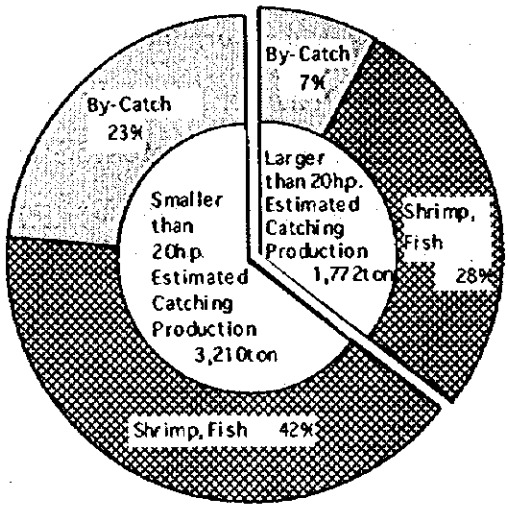

Fig. 6-53 Estimated Catch Composition of Trawlers by Engine Capacity

6-6. Fisheries Infrastructure

At present, Quang Binh Province totally lacks any fisheries infrastructure; fishers simply use estuaries. The fishing port in Dong Hoi City is no exception, even though it is considered the center of the fishery sector in the province. There is no landing pier, and fishers uses sampans to carry fish to a narrow sand beach. There are a few supply piers made of wood. They are 40 m

in length, and a ditch is extended along the piers to convey ice. Because the port is located in the center of Dong Hoi City, roads nearby are in a good condition and there is an adequate parking space.

Next to the fishing port, there is a province-run fish processing factory for freezing fish and shrimp and drying squid. As this is the only fish processing factory in Quang Binh Province, fish are brought to it from all over the province. When we visited the factory in the late - November 1995, however, operations were suspended. We were informed that suspension of business is usual from November to December when fish supply is scarce.

The factory has an ice plant with a the daily capacity of 50 t. Three small ice plants in the north of the port together supply an additional 10 t/day of ice. Another plant in Bao Ninh Village produces 5 t, making the total daily supply to the port 65 t.

6-7. Fish Processing

The only fish processing factory in Quang Binh Province is located in Dong Hoi City. It can process up to 4 t at one time, mostly for export. Main products are dried squid, various species of finfish, cuttlefish for sashimi and shrimp. Construction of another processing factory is planned at Cua Gianh, in the northern part of the province, together with a new fishing port. The production of fermented products (fish sauce and shrimp paste) are not industrialized. They are made only by households for local commerce.

6-8. Voices of Fishers

Opinions of local fishers interviewed in Quang Binh Province are classified into (a) expectations and aspirations, (b) constraints, (c) positive development perspectives, and (d) negative development perspectives, and listed below in the order of frequency that the comments were made.

(a) expectations and aspirations

1, larger boats and gear;

2, capital, including long-term soft credit;

3, quality engines and spare parts supply

4, conversion to other fishing gear;

(b) constraints

1, inadequate capital and/or funds (7 persons);

2, short-term loans with high interest rates;

3, foreign vessels intruding in local fishing grounds;

(c) positive development perspectives (11 persons)

1, There is no serious threat in resources condition;

2, Offshore waters have under-exploited resources;

3, Export markets are promising

(d) negative development perspectives (7 persons)

1, degradation of coastal fishing grounds (5 persons);

2, declining catch owing to deteriorating resources;

Like all other provinces we surveyed, fishers in Quang Binh have a strong orientation toward the exploitation of offshore waters by larger boats. In particular, gill netters and trawlers strongly indicated a desire for larger vessels and the conversion to trawl (in case of gill netters) and purse seine.

6-3. Economic Factors

(1) Distribution and Marketing

1-1. Introduction

Until the mid-1980s, domestic distribution and marketing of fishery products were supposedly undertaken entirely by the Central Fishery Products Co., a public sector enterprise. Much of that distribution was in the form of remuneration for work and the remainder of the products were sold at fixed prices in public sector stores. Supposedly only small quantities of fresh and processed fish were traded directly among producers and consumers. However, since the main reason for the collapse of fisheries cooperatives was the illicit diversion of the catch from low price cooperative sales to direct marketing, in addition to illicit sales at sea, it must be supposed the formal role of the public sector was often limited.

Since the economic reforms of the late-1980s, public sector involvement in fish marketing became obsolete. Now, there is no formal nationwide market structure, but Viet Nam has an intricate and convoluted private sector system. In most cases buyers, agents and market intermediaries visit producers at the landing site or processing site and negotiate a deal. There is very little information available on the fish trading and marketing system or price and price trends in Viet Nam.

As a consequence of improper post harvest practices on board, prices paid by market intermediaries for fish from short-duration trips are usually higher than for those caught on longer trips. Among the more important are:

(1) The risk of contaminating catches is high because ice is separated on the fishing boat by using chipped wood which is reused several times. Storage holds for ice and fish are neither well insulated and nor carefully cleansed after each landing has been completed.

(2) No fishing vessels has either chilling or ice-making facilities on board; all ice taken on a fishing trip is made on land. Ice should

be made from either uncontaminated drinking water or sea water, but this is hardly seems to be the case in Viet Nam.

(3) On fishing trips, insufficient ice is used; a ratio of 1 kg ice to 3 kg of fish appears to be the norm, whereas 1:1 is regarded as optimum.

(4) On board storage of fish is either in bulk or large plastic barrels, instead of the preferred boxes with drainage holes to release ice meltwater. This means that the fish are steeped in dirty water often for many days during transport to landing sites, and also that they have to be unloaded and repacked at least once (and generally more often) before they reach the processing plant.

The quality of the fish available to the processing plants - particularly those more distant from a particular landing site - is further reduced by the poor organization of the landing facilities and by the distribution system. Unloading of larger vessels can sometimes take up to three days and fish are dumped unceremoniously either on the ground or on a concrete platform for repacking into large baskets for trucking to processing plants. Fish temperatures are further elevated by this, virtually ensuring that some level of contamination occurs.

There are the following four types of people involved in fish distribution and marketing:

1. Market Intermediaries,
2. Specialized Agents,
3. Market Wholesalers, and
4. Market Retailers.

1-2. Market Intermediaries

It is important to note that the main element in the fish marketing and

distribution system in Viet Nam is the market intermediary.[5] The great majority of these are women. Indeed in some landing sites all market intermediaries are women.[6] They range from large-scale operators who move large quantities of fish throughout the country to those who buy just one small basketful to sell in the local retail market. Many are the wives of fishers or boat-owners who began their business by handling their husband's or son's catch, and gradually expanded from that base. Some handle just their husband's or son's catch.

For this survey only 8 market intermediaries were interviewed in depth (7 in Nha Trang and 1 in Phan Thiet) divided equally by gender.[7]

Little investment in fixed assets is required in this business; indeed, the smaller-scale participants in this sector have none, simply operating from home. At most, market intermediaries have a motorized vehicle, usually a small motorcycle, often with a trailer attached. Some of the larger ones own an old truck, or, if hauling fish from islands to the mainland, a small boat. Few have storage facilities or office space. Similarly, recurrent costs are limited. All market intermediaries reported expenses for employees as the largest annual cost. Those who lack a motorized vehicle must pay for truck or motorcycle rental. Fuel, taxes and miscellaneous minor expenses are the only additional costs of operating as a market intermediary.

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5 Generally known as Middlemen, a term particularly inappropriate in Viet Nam, where the majority are women!

6 Along with fish processing, and net-making and repair, the market intermediary is one of the principal areas of involvement of women in marine capture fisheries in Viet Nam. An estimated 14% of the fisheries labor force is composed of women over 16 years-of-age (B.D.Chung, 1993)

7 A larger sample would have been very desirable, given the paucity of information on this important topic. Time was the major limitation, since this is a sensitive topic for interviews.

Table 6-19 Prices, Margins and Incomes of Market Intermediaries in Nha Trang and Phan Thiet (Unit: USD)

Gender	Main products	Purchase price per kg	Sales price per kg	Profit (%)	Volume (ton per year)	Fish income per year	Total (Other income) per year	% from Fish
F	Miscellaneous finfish	0.54	0.59	8.3	3.0	150	5,400 (5,250)	2.8
M	Shark fin	31.8	32.7	2.9	3.0	2,700	98,000 (95,300)	2.8
F	Miscellaneous finfish, cuttlefish	0.90	0.95	5.0	300.0	15,000	272,000 (257,000)	5.5
M	Shrimp, cuttlefish	1.36	1.45	6.7	100.0	9,000	145,500 (136,500)	6.2
M	Miscellaneous finfish	0.90	0.95	5.0	50.0	2,500	45,500 (43,000)	5.4
F	Miscellaneous finfish	0.45	0.50	10.0	60.0	3,000	29,000 (26,000)	10.3
M	Miscellaneous finfish, squid, shrimp	0.54	0.59	8.3	30.0	1,500	19,000 (17,500)	7.8
F	Squid	2.72	3.09	13.3	1.8	666	2,700 (2,061)	24.6

Although many market intermediaries are highly specialized, many small-scale market intermediaries are opportunistic traders who have established a specialized niche for themselves in fish distribution, but who are not necessarily specialized in fish trading. Typically such persons will have several sources of income, such as a general store, fish trading, and maybe fish harvesting through (co-)ownership of fishing boats. Such opportunistic entrepreneurs entered fish trading relatively recently, in the years since market liberalization. Often such people have established a specialized niche, like the purchase of high quality fish for sale to a local processing factory. Based on factory-defined purchase prices they buy fish from fishing boats, seeking small margins.

Others, however, are highly specialized (Table 6-19). Whereas most deal in miscellaneous finfish, all but one have a specialization. Further, profit rates are relatively high, ranging from 2.9 to 13.3%.

All of the market intermediaries surveyed operate only locally. Three purchase for re-sale to a local frozen fish plant, whereas the remainder purchase local fish for resale to agents from major fish processors located in other parts of Viet Nam (particularly in Ho Chi Minh City). These processors regularly visit the market intermediaries homes to make their purchases and arrange long-distance truck transport.

1-3. Specialized Agents

The major companies processing marine products use their own special agents to buy raw materials from the main fish landing points. For example, the Hung Vuong Food Processing Export Co. has agents stationed at fish landing points throughout southern Viet Nam. They purchase raw materials, which are then delivered by refrigerated truck to the factory.

Similarly, the Vietlong Frozen Food Enterprise purchases raw materials at the landing sites through the company's own agents. However, since there are not enough such people, independent purchasing agents are also used. Most raw materials are obtained via the independents. No purchasing contracts are made directly with fishing boats or boat owners, but 6 - 12 month contracts are made with independent purchasing agents. The company does not make cash advances or give credit to these independent agents. However, such agents do give credit and cash advances to boat captains/owners.

Such independent agents may be regarded as a specialized sub-set of market intermediaries, who deal in particular species of fish and usually supply market intermediaries based in Ho Chi Minh City. Gender, age, education levels are similar to those of market intermediaries, as is the mixed character of their overall business undertakings. As with market intermediaries no specialized agents interviewed had any fixed assets, and operate their business from home.

Neither have storage facilities or office space. Similarly, their recurrent costs are limited to those for labor, truck rental and tax payments.

Two independent agents were surveyed in Vung Tau City. Both are locally-born, middle-aged women who purchase skipjack, Spanish mackerel and mackerel in local market and sell them to other market intermediaries based in Ho Chi Minh City, who ,in turn, sell the fish either to fish processing plants or retail markets in Ho Chi Minh City.

It is recognize that a major improvement should be achieved in the way that fish are handled on board fishing vessels and during transportation to processing plants. For this reason plant managers station agents at the major landing sites to try to ensures that fish will be relatively fresh by the time they reach the processing plant. But this still does not overcome the many deleterious practices, as discussed earlier, for fish quality in Viet Nam.

1-4. Market Wholesalers and Retailers

In Ho Chi Minh City and Cholon, there are four fish wholesale markets. Three in Ho Chi Minh City, Ong Lanh, Hoa Binh and Xom Cui, are for marine fish and that in Cholon, the "50" market, is for freshwater fish. All are administered and operated by the Aquatic Products Trading Co, Service of Commerce, Ho Chi Minh City

The Ong Lanh Fish Wholesale Market, for example, receives fish delivered by refrigerated truck from Nha Trang, Phan Thiet and Vung Tau. Relatively little is sold there from south of the Mekong Delta. The market is run by the city, and operates 7 days a week.

There are four stages in the domestic marketing system:

(1) From fishing boat purchased by landing site wholesaler or his agent,

(2) Purchaser rents truck and delivers fish to Ho Chi Minh City,

(3) Truck renter sells fish to wholesalers (women) in the Ong Lahn Market, and

(4) Purchased by retailers for sale to consumer in neighbourhood markets.

Price doubles with first sale, since the first purchaser assumes the risk of such market conditions as over-supply and consequent depressed prices, and any transportation difficulties. Wholesalers make about 4% profit on sales to retailers. Retailers make about 10% profits on sales to consumers.

Most dealers are ethnic Vietnamese who specialize exclusively in the fish trade. Long-term business relationships unite each link in system, with wholesalers often being linked to fishers by the provision of credit.

(2) Fisheries Management

2-1. Legislative Background

Viet Nam is still engaged in making basic legal and institutional changes as it shifts from a centrally-planned economy to one with a greater market orientation, based on decisions taken at the Sixth Congress of the Vietnamese Communist Party, in 1986. As a consequence, the present legal framework governing fisheries remains fragmented and still lacks coherence. Matters of national concern have been addressed in such areas as the delineation of the territorial sea, the exclusive economic zone and the continental shelf, taxation, and foreign fishing. However, although there exist the recognition of an overfishing problem, the problems of small-scale and industrial fisheries management have yet to be addressed under very diverse regional differences in effort levels, coastal-marine ecosystems, target species and fisheries development.

In Viet Nam, there have been four major pieces of legislation, in the form of either declarations or decrees, of importance to the management of marine fisheries. First, a declaration issued on May 12, 1977, described the territorial sea, contiguous zone, exclusive economic zone and continental shelf of Viet Nam, based on the conclusions of the Third UN Law of the Sea.

The other pieces of legislation govern the protection and use of living

aquatic resources. On April 25, 1989, the State Council promulgated the Ordinance *On the Conservation and Management of Marine Resources.* This was apparently intended to serve as the main instrument for national living aquatic resources manage-ment. This covers many provisions necessary for the management and protection of resources, advises of the rights of various stakeholders to exploit resources, and specifies duties and responsibilities of various organs of national, provincial and local governments for planning, monitoring and resolving conflicts over aquatic resources. Further, all regulations preceding this Ordinance were thereby abrogated. The resource conservation and management provisions of the 1989 Ordinance, and as authorized by it, were refined by a Decree issued on June 2, 1990 by the Vice-Chairman of the Council of Ministers.

Finally, on August 30, 1990, a highly detailed Circular issued by the Vice-Minister of the Ministry of Fisheries provided instructions on many aspects of the management and conservation of living aquatic resources. These instructions include allowable concentrations of toxic substances in waters inhabited by aquatic organisms, minimum permitted mesh sizes by gear type, total allowable catch, marine organisms the exploitation of which is prohibited, closed seasons by species, areal closures during spawning seasons, and minimum allowable catch sizes by species. For the purposes of this legislation, the marine waters were divided into five areas, defined by latitudinal and longitudinal coordinates. Sub-areas were defined in the same way.

Since several complaints have been voiced regarding the inaccessibility of this information (e.g., ADB/FAO, 1993; DANFICO, 1995), one example of those details have been tabulated here for the areas reported on mostly the Central Region, but also the southern part of the Northern Region (Quang Binh Province) and the northern part of the Southern Region (Binh Thuan and Ba Ria-Vung Tau provinces.) This is based on the work of N. Long (1993), in which examples of all the other regulations detailed in the 1990 Circular are presented. In the map accompanying the Circular of 1990 the Northern Region

is Sea Area 1, the Central Region is Sea Area 2, and the Southern Region is Sea Area 3. This enumeration is used in Table 6-20.

Table 6-20 Total Allowable Catch (Tons) by Sea Area and Water Depth

Sea Area	Total	Pelagic Species	Demersal Species
SEA AREA 1			
Total	325,000	160,000	165,000
Shallow water (1-30m)	75,000	50,000	25,000
Deep water (over 30m)	250,000	110,000	140,000
SEA AREA 2			
Total	240,000	200,000	40,000
Shallow water (0-50m)	80,000	60,000	20,000
Deep water (51-200m)	110,000	100,000	10,000
SEA AREA 3			
Total	490,200	210,000	280,000
Shallow water (0-30m)	320,000	120,000	200,000
Deep water (31-100m)	130,000	70,000	30,000
NATIONAL TOTALS	1,300,000	700,000	600,000

2-2. Fisheries Regime

At the national level fisheries operate under an open access system. At the provincial level, fisheries are of open access to all provincial fishers. In some cases, inter-provincial entry contracts, plus an entry license for each boat, are made to permit outsiders to operate in provincial waters.

2-2-1. Licensing

Provincial fishers fishing locally require an annually renewable "package" license, based on crew size, engine capacity and gear type. Only large boats are permitted to operate outside their own provincial waters.

The MOF limits the total effort permitted on each fishing ground. This limit, revised every 5 years, is made known to the provinces. Each province then allocates the allowable effort on fishing grounds over which it has jurisdiction.

Entry rights are allocated first to boats from its own province, then, with the concurrence of the MOF, the balance is allocated annually to those from other provinces. In addition to paying tax to their province of registration, outsider boats must pay tax to the province in which they fish.

***Small boats, which are allowed to operate only within provincial waters, do not require a license. However, a special license is required if they operate diving gear.

2-2-2. Provincial Conservation Measures

In addition to implementing resource conservation regulations established by the MOF, each province can make its own regulations. They also "adapt" national regulations to local conditions. Local social and economic conditions act as a "reality constraints" on the implementation of national fisheries policy and regulations. The professional capacity, information basis and the logistical situation also constrain implementation at the provincial level.

For example, in Khanh Hoa Province, although the Chairman of the People's Committee of the Province has issued marine conservation measures essentially as an implementation of national regulations they cannot yet be implemented because, according to provincial fishery officials, the rural people are so poor. As a result, deleterious practises in resource use are still permitted despite the recognition by the authorities. Coral reef exploitation and mangrove-cutting and the fishing in Nha Phu Lagoon are in reality still allowed despite official bans and regulations._

In Quang Nam Da Nang Province, areal and seasonal closures for specific gear types are made in known spawning locations, particularly for lobster, cuttlefish, prawns, and several demersal species. In addition, since fishing grounds are so large and thus difficult to monitor, the buying and selling of the closed species is also banned, with fines imposed for infringement. It is, however, problematical to protect closed areas against boats from other provinces

In this province, the opinion of fishery officers is that were the government prohibition on small fishing vessels in inshore waters to be strictly enforced, as well as those controlling mesh sizes, chaos would ensure in the industry, since fishers cannot yet afford to build larger boats and to invest in different gear. They claim that these measures be therefore be introduced only gradually.

2-2-3. Fisheries Management at the Local Level

The former public sector cooperatives have now been largely disbanded. They either leased or sold their equipment to private operators. Where they remain operational they have become service sector cooperatives.

Traditional fisheries management practices occur widely, especially along the central coast of Viet Nam. These systems were neglected by the government, so their former power has declined. But the Provincial Government of Binh Thuan, for example, is now beginning to reconsider their usefulness in modern fisheries management.

The government of Viet Nam faces a major problem in trying to enforce existing marine capture fisheries legislation, since fishers are apparently unaware of national fisheries laws and regulations, and base their operations mostly on local rules. An ADB/FAO report notes "given the length of the coastline, the marked differences among regions and the difficulties of monitoring, surveillance and enforcement, delegation of resource management functions - within the umbrella of an appropriately flexible national framework - to local institutions, including fishermen organizations, appears to be the only workable solution to this problems" (ADB/FAO: 8).

(3) Inputs Supply

3-1. Boat Builders

3-1-1. Boatyards

Each province has at least one government-owned boatyard and an

unknown number of small, scattered private yards. Although there are some large private boatyards operating from fixed locations, most are very small temporary facilities with no infrastructure mostly in the lower reaches of rivers or on lagoon shores.

In Ba Ria-Vung Tau Province, there is one government-owned boatyard and three private yards. Some of the latter have "sub-yards" close to the smaller fishing communities. Similarly, in the four other provinces surveyed, there are often one or two large government-owned yard and many small private yards.

3-1-2. Lumber Supply

The availability of lumber and its pricing and licensing requirements vary by province and depend mainly on the area and quality of provincial forest resources. The supply of timber is constrained in both Ba Ria-Vung Tau and Quang Nam Da Nang provinces which have only a relatively small forested area compared with other provinces.

In contrast, Binh Thuan Province is one of the nations' leading forestry regions, and all lumber for boat-building can be obtained from provincial sources, with lower lumber costs. Similarly, since Khanh Hoa Province still has an abundance of the *sao sent* timber required for boat-building, the price is relatively low and a lumber license is not required.

3-1-3. Labor

For small private yards that are established when and where a fishing boat is to be built, labor requirements are fulfilled from the boat-builder and his family. Most larger yards employ some permanent labor, with supplemental part-time labor. At the private Tan Ben Co., located in Phuoc Tinh, Ba Ria-Vung Tau Province where the financial mainstay is a large boat repair and maintenance business rather than the construction of new boats, a further 100 - 200 seasonal laborers are employed during the October - February period as repair and maintenance work is largely seasonal, being done in the slack season for fishing.

3-1-4. Technology and Attitudes Toward Innovation

Most boatyard officials interviewed have no interest in building anything but wooden boats, claiming that they are experienced and confident only in traditional technologies and they lack the ability to use other construction materials.

Further, since fiberglass vessels are still 50% more expensive than the traditional wooden ones, it is thought by many that for the time being there would be no domestic market for them unless the government implements a financing scheme. However, as the price of lumber increases with decreasing supplies, and as the price of fiberglass declines, it is felt that a technological switch will begin to occur. Some yard managers consider that within the next 5 years they must begin producing boats made entirely of fiberglass.

In fact, the beginnings of a materials technology change in hull construction may be discerned, as illustrated by the following examples:

(1) A government boatyard in Vung Tau City, which has been constructed only wooden boats to date, has a technical cooperation arrangement with a private French company to construct fiberglass boats. The yard manager claims that they now would be able to build them should a purchaser request it.

(2) A province-owned boatyard in Binh Thuan Province is experimenting with fiberglass coverings for wooden boats, with the hope of eventually building boats made entirely from fiberglass.

(3) A government boatyard at Phan Thiet, Binh Thuan Province, is focusing on making fiberglass composites for new boat materials to eliminate the use of wood, and on the design of such new boats, 19.5 m in length and equipped with 350 h.p. engines.

3-1-5. Capital

Obtaining capital to expand the boatyards is problematical in all cases examined. As with many boat-owners and captains, the owners of private boatyards are loathe to borrow from the bank, whose interest rates are considered too high and its 6 - 12 month loan periods too short. Until now, the owners of private boatyards have raised capital privately from their own family members.

For example, the Marine Products Exploitation Company of Binh Thuan Province can borrow funds from the bank but only for short periods and at a high rate of interest. Loans are available for only 6 - 12 months at a rate of 1.6% per month. They now have a license from the People's Committee to build a dry dock and for this have just received a long-term bank loan of 5 year term at an interest rate of 1.11% per month. The yard was unable to seek private investment capital because the interest rates are even greater in the private sector.

3-1-6. Physical Constraints of Boatyards

Many boatyards suffer from a variety of serious physical constraints, most of which are locations. For example, the government yard in Ba Ria-Vung Tau is capable to build vessels larger than 18 - 20 m. However, because it has to truck them along the highways to the purchaser, overland transport constraints preclude larger size vessels.

In some instances the capacity of government-owned boatyards may be inappropriate for the existing needs and financial capacity of provincial fishers. For example, the major problem in the government-owned yard in Dong Hoi City is that its large boat construction specialization is not well-suited to the needs of the relatively poor local fishers. As a result, it is underutilized and operating at only about 50% capacity. It receives very few orders other than government patrol vessels. Fishers prefer to buy smaller vessels from private yards. However, one incentive for fishers to build boats here is that the yard can

supply the balance of the credit (up to USD 1,800 - 2,700) required for a new boat, provided that the boat-owner can raise the rest elsewhere. This yard once supplied vessels to Ba Ria-Vung Tau Province, but for the last 10 years there have been no contacts with the south. No sales promotion visits are ever made there because each province has a government boatyard for provincial work..

3-1-7. Hull Prices

Average national prices in 1993 for fishing boat hulls are shown in Table 6-21.

Table 6-21 Average National Prices (1993) for Fishing Boat Hulls

Hull Length(m)	Hull Capacity (m^3)	Price (USD)
12.0	53.7	3600
13.3	57.0	4,500
13.5	59.9	5,500
14.0	84.0	5,900
14.7	92.0	6,400
15.4	107.0	7,300
16.0	128.0	7,700
17.0	163.0	13,600
19.0	205.0	15,500

Source: N. Long (1993)

Hull prices vary among boatyards and between provinces. At the government-owned boatyard in Da Nang City, hull prices are as follows:

- Hull length 17 m: USD 18,200 - 27,300
- Hull length 20 m: USD 32,000
- Hull length 26 m (equipped with a 300 hp engine): USD 91,000

Hull prices at the government-owned boatyard in Dong Hoi are as follows:

- Hull length 14 m (33 h.p. engine): USD 5,900
- Hull length 17 m (45 h.p. engine): USD 10,000

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- Hull length 17 m (60 hp engine): USD 12,700

3-2. Other Input

Depending on the purchaser's request, boatyards can supply either fully equipped boats or just finished hulls with superstructure. In the latter case they are later fitted with an engine and other components by the purchaser independently. All components of a boat are provided by separate, specialized private suppliers, located close to the permanent boatyards. However, such private entrepreneurs occupy space within the yard of the government boatyard in Ba Ria-Vung Tau Province to manufacture (or finish) and supply ropes, propellers, engine shafts, and all the other components required to completely outfit a fishing boat.

3-2-1. Engines

Mostly used but sometimes new engines are imported from Japan and China, and new Vietnamese made engines purchased from the manufacturer in Hanoi. The cost of Japanese new engines is about 200 - 250 USD per unit h.p. and approximately USD 80 - 100 per unit h.p. for used engines. Four sizes of engine are imported: 22, 33, 45 and 66 h.p. Two small sizes of used Chinese-made engines are used: 15 h.p. (USD 363 - 545) and 18 h.p. (USD 727). Only the 12 h.p. Vietnamese-made engine is used; they have the merit of being relatively affordable, at USD 181, but require frequent maintenance and have a relatively short serviceable life. In contrast, Japanese-made engines are prized for their reliability and Chinese-made units are reputed to breakdown quite frequently.

In Ba Ria-Vung Tau and Binh Thuan provinces, used Japanese-manufactured marine engines are purchased from an importer located in Ho Chi Minh City. Such used engines are then either purchased directly by the individual boat-owners or purchased on their behalf by boat-builders.

Engines from 33 - 300 h.p are generally used and converted truck engines of Japanese origin. If used for trawling, such engines require an annual

overhaul. Although having long been used in truck service in Japan, such engines are regarded by the boat captains interviewed as highly reliable. Engine gear systems are imported mainly from China.

Average national hull and engine maintenance costs in 1993 have been estimated by N. Long (1993). Boats with an engine capacity of 33 h.p. or less require maintenance every two months and annual repair. The annual repair cost is USD 18 - 27. Boats with engine sizes about 33 h.p. require maintenance every four months and annual repair. Annual repair of these larger engines is USD 90 - 135.

3-2-2. Fishing Boat Equipment

Propeller supply is done by small private workshops in all five landing sites. Rough-cast brass propellers are machined and finished, and fitted with sub-components either made locally in the same shop or obtained from other suppliers. They can be supplied in bulk to boatyards or individuals, according to boat owners' specifications. Some propeller makers provide propellers at cost to boat-owners, deferring their profit to be paid later from boat-owner's annual gross income. Similarly, rough-cast anchor weights and "heads" are finished by private anchors-makers in the fish landing sites.

The largest trawlers are equipped with hydraulic wire winches for setting and retrieving trawl nets, and hydraulic capstans are used on some trawlers and large purse-seiners. Those that use light attraction also have a generator set on deck. Such generators are generally rigged-up from an old truck engine fitted to an alternating current generator. In the Southern Region the larger gill-net boats are equipped with home-made net hauling gear, using automobile wheel rims and worn-out tires and powered by off-take from the boat engine.

For radio, echosounder and navigation equipment, there are no official suppliers. Fishers in Quang Binh Province deal with a company located in Hue, which imports equipment directly from Japan. Similarly, companies in Da Nang

City and Ho Chi Minh City supply to other parts of the Central and Southern coast.

3-2-3. Fishing Gear

Fishers obtain gear-making materials on the open market from private suppliers. Gear-making materials are manufactured by a net-making factory in Ho Chi Minh City. In all five landing sites fishers purchase these materials and fabricate (and repair) nets at home, using household (mainly female) and crew labor.

Table 6-22 Cost of Trawl Gear in 1993 (USD)

PARAMETER	TYPE 1	TYPE 2	TYPE 3
Floating top rope	30 m	28.4 m	16.4 m
Gear length	45.28 m	45.6 m	27.3 m
Mesh size (mouth)	100 mm	160 mm	40 mm
Mesh size (cod end)	28 mm	40 mm	20 mm
Price	1,000-1,100	1,800-2,000	450-550

Source: N. Long (1993)

Table 6-23 Cost of Lighted Purse Seine Gear in 1993 (USD)

PARAMETER	TYPE 1	TYPE 2
Top length	262.5 m	440 m
Bottom length	254.5 m	440 m
End depth	45 m	50 m
Middle depth	75 m	110 m
Mesh size (catching part)	18 mm	22 mm
Total gear weight	685 kg	2,212 kg
Price	4550	14,500

Source: N. Long (1993)

Trawls, for example, are made from nylon thread or "plate" imported from China, Japan or Taiwan. Generally, such fittings as floats, rollers on ropes, and the like are done by the crew. The large seine nets used in the Southern Region are either imported ready made from Indonesia or, more commonly, the materials are imported and then fabricated and fitted-out by crew and family

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members. Tables 6-22 - 46 show national average prices of the major types of gear in 1993.

Table 6-24 Cost of Gill and Trammel Nets in 1993 (USD)

PARAMETER	Tuna & Mackerel Gill Net	Drift Bottom Gill Net	Shrimp Trammel Net
Length	6,000 - 8,000 m	1,000 - 2,000 m	1,000 - 2,000 m
Length of 1 net unit	62 m	50 m	48 m
Height	14 m	4 m	3.2 m
Mesh size	100 mm	80 mm	50 mm (in) 360 mm (out)
Net weight (per unit)	22.3 kg	0.8 kg	1.2 kg
Rope weight	2 kg	1.3 kg	0.8 kg
PRICE per net unit	90 - 135	27	27
PRICE total gear	8,700 - 17,500	540 - 1,080	560 - 1,130

Source: N. Long (1993)

(4) Credit

Credit and other financial services are obtained from a variety of formal and informal sources. Within the former, banks play the predominant role, whereas within the latter, the main credit suppliers are family members. However, most boat-owners raise credit by combining funds obtained from a bank with those raised from one or more sources in the informal sector. Despite recent striking advances in the provision of formal financial services in Viet Nam, informal sources remain pre-eminent in fishing communities.

4-1. Formal Credit Supply

Under the overall policy shift from a centrally-planned to a market economy since 1987, the financial sector has also been restructured. The basic restructuring took place in 1988 with the redefinition of the role of State Bank of Viet Nam to serve exclusively as the Central Bank and the creation of four state-owned commercial Banks (i.e., the Viet Nam Bank for Agriculture, the Industrial and Commercial Bank, the Bank for Investment and Development, and

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the Bank for Foreign Trade). The variety of banking services was extended by legislation in 1990, and savings and loan institutions were established in 1994. As a consequence, the range and variety of financial institutions operating throughout the country has increased greatly within the last 2 - 3 years.

Despite this reform, the credit sector of Viet Nam still faces major problems, many of which reflect attitudes within Vietnamese society rather than being specific to the financial sector. These problems result in a low level of savings mobilization. These factors include:

(1) a general lack of confidence in the formal financial institutions because of peoples' memories of the failure of credit cooperatives in the 1980 - 90s;

(2) recent experience of hyper-inflation made people prefer to holding savings in gold, real estate, fishing boats, or other tangible assets;

(3) savings held in a financial institution attract the attention of tax authorities; and

(4) interest rates on demand savings have been below inflation rates.

In addition, technical deficiencies within the formal financial system compound those perceptions of potential and actual clients. The systemic deficiencies having immediate impact in the fishing communities surveyed are:

(1) lack of bank staff experience in commercial banking leads to time-consuming bureaucratic procedures and general inefficiency;

(2) concentration on short-term lending owing to a scarcity of funds for medium- and long-term loans;

(3) high equity and collateral demands placed on borrowers; and

(4) a highly inverted relationship between interest rates and loan length; that is, interest rates are higher for short-term loans than for medium- and long-term loans.

The Viet Nam Bank for Agriculture (VBA) is the principal formal source of credit in the agriculture and fisheries sectors. With almost 2,600 offices, it has the largest network of any financial institution in the nation, and is represented in all provinces. Some 30% of its loans are to rural households. About 85% of loans consist of short-term and small-scale credit, with an average loan size per household of USD 290. Loans of less than USD 90 usually require no collateral, but for most loans in excess of this amount 130% collateral coverage and 50% equity are required. If a loan is under USD 909, guarantees can be used to replace some of the collateral requirement.

Interest rates of all state-owned commercial banks, including the VBA, are set by the State Bank of Viet Nam. They are as shown in Table 6-25.

Table 6-25 Terms and Interest Rates of the State-Owned Commercial Banks in Viet Nam

Loan Type	Term	Monthly Interest Rate (%)
Short Term	Less than 1 year	1.75
Medium Term	1-3 years	1.70
Long Term	More than 3 years	1.70

Sources of Capital of Boat-Owners Surveyed

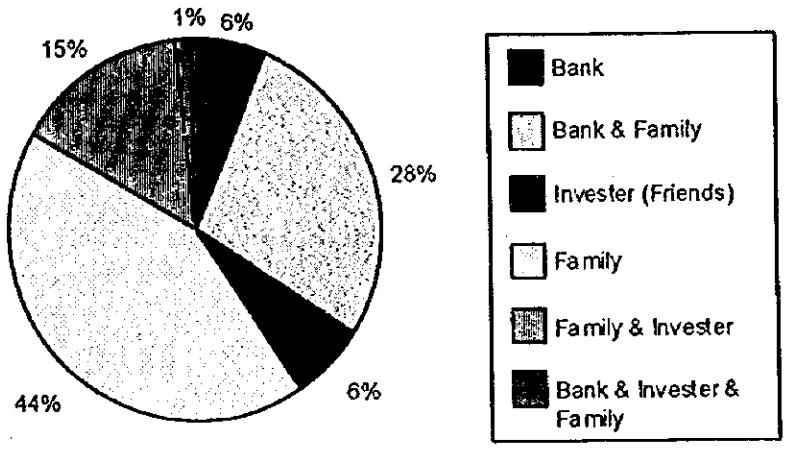

Fig. 6-54 Sources of Capital of Boat-Owners Surveyed

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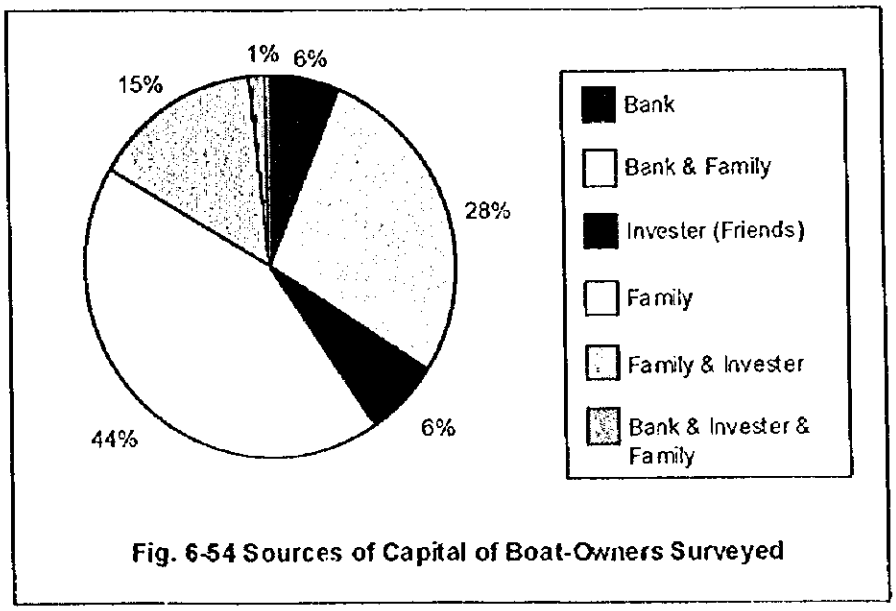

Fig. 6-54 Sources of Capital of Boat-Owners Surveyed

The sources of credit used by boat-owners to build new boats to purchase engines, gear and other essential equipment is shown in Fig. 6-54. First, the most popular way of raising funds is credit from family members and 44% (n=79) of respondents fall in this category. In addition to reflecting the general scarcity of collateral among boat-owners, especially those who are not already relatively well-off, this is a reflection of the high cost and short term of bank loans. Rates of obtaining credit from family members range from 55% in Da Nang to a low of 20% in Dong Hoi. This range reflects the relative affluence of the general population in Quang Nam Da Nang Province and relative poverty in Quang Binh Province.

Second, the 28% of boat-owners have raised capital from a combination of family sources and bank loans. This rate is 72% in Dong Hoi, again reflecting the general lack of financial resources within families in that region. In Vung Tau only 40% of boat-owners obtained credit from the bank; this may reflect wealth among Vung Tau boat owners.

The third most popular way is to obtain loans from a combination of family members and investors (generally friends from within the same fishing community), and 15% of boat-owners raised capital in this way. Like bank loans, raising capital from investors is expensive. However, whereas bank loans are expensive in the short-term, loans from investors have a long-term cost, since investors usually take a permanent share of the boat-owner's annual profits. For this reason, only 6% of boat-owners obtained capital from investors or partners alone. This is the same as the rate of 6% for bank loans.

Overall interest rates on bank loans obtained by boat-owners average 2.24% per month in all five fish landing places surveyed. Rates range from a below average of 1.85% per month in Nha Trang and Da Nang to 2.19% in

Dong Hoi, 2.26% in Phan Thiet, and 2.96% in Vung Tau.[8]

Loan periods also vary, with a range of 0.25 - 4.0 years and an average of 1.7 years. Average loan periods are shortest in Dong Hoi (1.3 years) and longest in Vung Tau (3.0 years). This again may reflect the relative poverty of Dong Hoi fishers, compared with the relative affluence of those in Vung Tau, and therefore the risk-taking perceptions of bank loan officers.

4-2 Informal Credit Supply

4-2-1. Loans from Family Members

Of 69 boat owners responding, 44% obtained their capital entirely from loans made from family members; either family members alone or in combination with some other source of credit. Only two of them were required to pay 5 - 10% annual (compared with monthly at the banks) interest on the outstanding balance, but without a precise repayment schedule.

In many cases credit obtained from family members or friends is repaid by making the provider(s) permanent partners or joint-owners in the fishing enterprise. Partners or joint-owners receive a return on their investment based on a share system as long as the fishing boat remains in operation[9]. Regardless of fish landing site and gear type, this is usually a simple percentage division of the annual profits based on the proportion of the investment by each partner, including the boat owner.

Of the 86 boat-owners surveyed, 37 (43%) have partners in their fishing enterprise. Only a very narrow range of people become partners of a boat-owner. There are three main categories: son(s), other nuclear family members (but only

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8 It was not possible to ascertain satisfactorily why interest rates reported by boat-owners surveyed were consistently higher than the official rates set by the State Bank of Viet Nam. This topic requires further exploration, although it is to be supposed that a convincing answer would prove elusive.

9 This is quite separate from the annual profit sharing system among boat owners, captain and crew (see below).

rarely a nephew or son-in-law), and friends. In all cases samples "friends" comprised fishers from the same community as the boat-owners. When more than three investors are involved with a boat-owner, the investing group usually comprises "family and friends".

Boat-owners using a modern, thus costly fishing technologies such as purse-seining, pair trawling and long drift gill-netting account for 49% of those with investment partners. However, poorer boat-owners who have relatively low total investment costs, such as long-lining or lift-netting, also seek investment partners.

Although Vung Tau is a landing site that has most rapidly adopted capital-intensive fishing technologies, only few survey respondents (11%) had investment partners. Most likely this is because fishers in Vung Tau are relatively well-off and thus able to fund their operations on themselves or obtain loans without taking-on partners. The highest rates of partnership occur in Da Nang (35%) and Nha Trang (27%). Reflecting the relative poverty among fishers and the desire to expand their fishing enterprise with the advent of the market economy. 57% of boat-owners surveyed in Dong Hoi have an investment partner.

4-2-2 Money Lenders (Investors)

Only 6% of boat-owners raised capital entirely from money lenders. Such people are known as *nau* in the Northern and Central regions and *vua* in the Southern. (The latter term meaning literally "to rake in [money]"). Such people are mainly fish market intermediaries who combine money lending and other businesses with their main business of fish marketing. In the Northern and Central regions money lenders provide capital for the purchase of fishing boats, whereas in the Southern Region they mostly cover the cost of fishing supplies such as ice, drinking water, food, fuel, lubricants.

This is not a popular source of funds among boat owners because interest rates are relatively high and lending periods are limited; the maximum

period in the sample being two years. However, less collateral is required than for bank loans. Interest rates are usually 3% per month. In addition, since most money lenders are also fish market intermediaries, boat-owners are required as a condition of the loan to sell their catch to them. Although in some cases this is done at the prevailing market price, mostly the catch is sold to the money lender at a discount of 10 - 15%.

The business arrangements between money lenders and boat owners vary considerably. In some cases no interest is charged on the loan, but catch sales arrangements can be onerous. Some arrangements require the sale of the entire catch to the money lender, whereas in other cases only part of the catch is sold discounted to that person. In some instances no repayments are claimed from the boat owner if catches are bad, but under those conditions the repayment accumulates.

There are usually several or more money lenders in all but the poorest fishing communities. They compete for "clients" within the community, and richer money lenders can have business relationships with several or more boat owners. Since money lenders may have to compete among themselves within a community to invest in a fishing boat owner, they are obliged to be as generous as necessary with their "clients". In addition to making gifts on special occasions of festivals and family ceremonies, they must also assist them during times of need. On the other hand, boat-owners have such a relationship with only one money lender, and they can change their money lender if the relationship sours. In some instances it was reported that fishing families had maintained a business relationship with a specific money lender family for several generations, with sons and daughters on both side of the arrangement inheriting mutual obligations.

4-2-3. Sources of Capital of Market Intermediaries Surveyed

As with boat-owners, market intermediaries rely mostly on family members to supply credit. There in very little reliance on banks, and no

examples were found of market intermediaries obtaining credit from friends or financial institutions other than banks. Among the sampled market intermediaries, only one obtained credit exclusively from a bank, borrowing USD 1,800 for 12 months at an interest rate of 2.6% per month.

Seventy-five percent of the market intermediaries surveyed obtained credit exclusively from their family members. In no case was interest charged and no repayment schedule was set. One person combined a short-term bank loan of USD 18,100 with money borrowed from family members. But only 17% of the total credit borrowed was obtained from the bank.

The levels of credit obtained by 8 market intermediaries surveyed as ratio of the annual profit of their total business dealings in shown in Table 6-26. As is shown, in half the cases the level of credit was below the annual profit made. However, in three cases (examples 3,4, and 5) where the level of credit ranged from 100 - 300% of annual profits, the market intermediaries specialized in supplying local frozen fish factories, a stable local relationship that enhances their creditworthiness. In example 2, the high credit level obtained was necessitated and secured by this intermediary's exclusive specialization in shark fin trading.

The *Vietnam Living Standards Survey 1992 - 1993*, which sampled 4,800 households nationwide, showed that out of the approximately 60% of households that had taken loans about 70% had borrowed from informal sources (SPC-GSO, 1994). A more recent survey in the rural sector demonstrated that 25% of all loans are obtained from family and friends, 36% is derived from market intermediaries and money lenders, and 34% from formal institutions (SPC, 1996). These more recent results should be interpreted with caution, since, as I have demonstrated, boat-owners try to combine formal sector or market intermediary-money lender capital with that obtained from family members. This more recent work seems not have discriminated these combinations, hence the share of borrowing from the family might be artificially low.

Table 6-26 Credit Obtained by Market Intermediaries as a Percentage of Annual Profit from all Business Activities Combined (USD)

Example	Credit	Annual Profit	Credit/Annual Profit (%)
1	909	5,410	17
2	109,000	98,000	111
3	272,700	272,700	100
4	181,800	145,400	125
5	136,400	45,500	300
6	9,100	29,100	31
7	4,500	19,100	24
8	1,800	2,700	67

(5) Fish Price

Vietnamese economy was under control of the Government prior to 1975. Then food stuffs, including fish, were supplied according to the national plan, and the price was determined by the Government. The country's economic systems transformed gradually, and free markets have been established for daily consumption since 1991. Currently the relation of demand and supply is the basic factor to determine the price of fish. Actual value of fish of a species may change for difference of season, area of production, quantity of landings, strength of demand, size, freshness, etc. It is difficult to clarify price of fish at landing sites, because the catch are usually delivered through negotiation transaction between fishermen and middle men, not through auction. Table 6-8 shows approximate figures of wholesale and retail prices of some fishes clarified through the inquiry. There appear the general tendencies of prices of different species of fishes in this country.

The price of fish at domestic markets is affected by the price at export markets. It is noted that the former tends to rise at a higher rate than the latter. Frozen fish are not consumed in most of the domestic markets, while fresh and iced fishes are accepted together with processed foods. Recently demand for frozen fish has risen in large cities typically for consumption at restaurants and hotels by overseas visitors. This new type of consumption is one of the causes for the

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rise prices of fish in the domestic markets.

Table 6-27 Fish Price in Viet Nam (USD/kg)

No.	Fish Name	Wholesale		Retail
		1995	1997	1997
1	sharks		1.0	1.2
2	ray		0.6	
3	bigeyed herring		0.3	
4	indian anchovy		0.3	0.5
5	lizardfishes		0.5	0.8
6	barracudasa		1.0	
7	flying fish		0.5	0.4
8	giant perch		3.0	4.0
9	red grouper		5.0	
10	purple-spotted bigeye		0.8	1.0
11	needlefish		0.9	
12	halfbeak		1.0	
13	blackpomfit	1.5	1.5	
14	silver pomfrt	1.5	2.0	3.5
15	yellow tail round scad	1	1.0	1.2
16	round scad	0.6	1.0	0.7
17	jackmackerel		0.4	
18	bigeye svad		2.0	1.0
19	amberjack		3.0	2.0
20	rabbitfish		1.5	
21	white croaker	0.8	0.6	1.7
22	large-yellow croaker	0.8	1.7	
23	sea bream		1.0	1.2
24	wahoo	1.85	2.5	2.9
25	indo-pacific mackerel		1.2	2.0
26	skipjack tuna		0.8	
27	eastern little tuna		0.8	1.2
28	frigate tuna		0.4	1.2
29	hairtail		1.0	1.0
30	indian mackerel		0.4	
31	common dolphinish		0.8	
32	billfishes		2.0	
33	bartailed flathead		0.6	
34	goatfish		1.0	
35	grouper		4.2	
36	snappers		1.5	
37	golden threadfin bream		1.2	1.8
38	fieldfish		1.0	
39	longtail tuna		2.0	
40	yellowfin tuna	2.5	3.0	

(6) Interactions between Marine Fishing and Other Economic Activities

6-1. Urbanization and Industrialization

In the absence of systems for treating sewerage, other waste water, domestic refuse and the miscellaneous residues of human settlements, coastal waters are the ultimate receptacle for waste, with the result of overproduction of phytoplankton, oxygen depletion, and attendant resource degradation. In localized sheltered marine and brackish areas, such as poorly flushed lagoons and deep embayments, this problem probably has already arisen. However, with the possible exception of shallow marine waters immediately adjacent to major urban centers, it is unlikely to be widespread over much of the coast, at least at present.

Holding far greater implications, especially for human health, is the widespread use of beaches as public latrines. Fish catches are then dumped, sorted, and often gutted and filleted on these same beaches, and finally rinsed "clean" in the filthy shallow waters.

Despite rapid growth in the last decade, the level of industrialization in Viet Nam remains low, and the levels of untreated industrial wastes entering marine waters still remain limited. However, with increasing levels of industrializationin the near future, there is the likelihood of toxic wastes accumulating and concentrating in marine fishery products, eventually rendering them unfit for consumption.

6-2. Aquaculture

Although the various components and types of aquaculture all could have potential impacts on marine fisheries, the principal one is likely to be the consequences of extensive mangrove clearance to construct onshore aquaculture facilities. In addition to mangrove's direct benefits to humans as a source of a wide range of useful products and raw materials, and flood and erosion buffering, it is well known that they have a very large indirect benefit with capture fisheries. Clearance of mangroves for aquaculture and other land uses

thus has a potentially deleterious impact on local fisheries. In Viet Nam, an estimated 60,000 ha of mangroves were cleared during the period 1985 - 88 (and an undocumented amount since that time), but the impact of this on capture fisheries remains to be seen.

***Shrimp hatcheries rely on captured wild brood stock. Since the prices for gravid females are very high, overfishing, particularly of *Peneaus monodon*, is a distinct possibility. This situation has arisen in other parts of Southeast Asia.

Shrimp farms in Viet Nam are located in coastal wetlands, principally mangroves, and based entirely on tidal water exchange. Viet Nam's traditional, extensive shrimp culture method now attracts attention for its ecological soundness amid the world-wide destruction of mangroves by intensive shrimp aquaculture. Unconsumed feed and shrimp feces discharged from many shrimp farms often cause organic pollution in adjacent coastal waters.

Depending on stocking density, other types of aquaculture, including marine fish, seaweed and molluscs, can lead to nutrient depletion and changes in the pattern of nutrient cycling, with a negative impact on capture fisheries, particularly where ambient nutrient levels are low and water recycling limited. The inherent pollution potential, especially in sheltered waters, is exacerbated in Viet Nam by the use of fish by-catches as feed in fish farming. Compared with pelletized feed, wastage rates are high in fish farms using by-catch, thereby increasing the pollution potential.

6-3. Others

The potential conflict with marine capture fisheries occurs through mangrove clearance and the discharge of highly saline residues from salt pans into inshore waters. However, no relationship has yet been demonstrated in the coastal waters of Viet Nam. By far the greatest interactions affecting marine fisheries are those endogenous to the industry. Principally this means the use of deleterious gear types, especially trawls, set bag nets, fixed tidal nets using

small mesh sizes, and, too a lesser extent, gill nets. Illegal fishery using explosives and toxic materials have a particularly deleterious environmental impact, and unfortunately such a practice is quietly spreading into many coastal areas of the Central Region.

6-4. Social and Cultural Factors

(1) Population Structure

The total population, gender and urban-rural balances of Viet Nam and the coastal regions and the five provinces surveyed are shown in Table 6-28 At the national level females comprise 51.2% of the population. The range in the regions surveyed is from 50.8% in Ba Ria-Vung Tau Province to 52.0% in Quang Nam Da Nang Province.

Table 6-28 Population Structure (1994) of Viet Nam, Coastal Regions and the Provinces Surveyed (Unit: 1000s and %)

Location	Total	Male	Female	Urban	RURAL
VIET NAM	72,510.0	35,386.4 (48.8)	37,123.1 (51.2)	n.a.	n.a.
North-Central Coast	9,726.6	4,700.3 (48.3)	5,026.3 (51.7)	1,053.9 (10.8)	8,672.7 (89.2)
QuangBinh	762.3	369.5 (48.4)	392.8 (51.6)	89.1 (11.7)	673.2 (88.3)
South-Central Coast	7,557.6	3636.1 (48.1)	3,921.5 (51.9)	1,762.1 (23.3)	5,795.5 (76.7)
QN Da Nang	1,952.7	937.3 (48.0)	1,015.4 (52.0)	603.4 (30.9)	1,349.3 (69.1)
Khanh Hoa	947.0	464.4 (49.0)	482.6 (51.0)	356.1 (37.6)	590.9 (62.4)
Binh Thuan	882.2	426.1 (48.3)	456.1 (51.7)	208.1 (23.6)	674.1 (76.4)
North-East South Coast	8,878.0	4,298.3 (48.4)	4,579.7 (51.6)	4,092.2 (46.0)	4,785.8 (54.0)
Ba Ria - Vung Tau	670.8	330.4 (49.2)	340.4 (50.8)	224.9 (33.5)	445.9 (66.5)

Source: Computed from data in State Planning Committee - GSO (1994) and GSO 1995(b)

Whereas the national average rate of urbanization is 10.8%, with the exception of Quang Binh Province (11.7%), all the provinces surveyed have

rates of urbanization greatly in excess of this figure. These rates range from 23.6% in Binh Thuan Province to 37.6% in Khanh Hoa Province.

Table 6-29 Percentage Composition of Population of the Five Landing Sites by Gender and Dicennial Age Group and of Viet Nam by Age Group

Age Group	Survey Male (%)	Survey Female (%)	Survey Total	National Total (%)
60+	3.7	4.0	3.8	8.51
50-59	5.5	4.8	5.2	5.90
40-49	9.7	12.4	11.1	7.47
30-39	15.4	16.7	16.0	13.51
20-29	21.0	21.7	21.3	16.15
10-19	27.4	19.4	23.7	23.31
0-9	17.2	20.9	18.9	25.16
Total	53.1(n=401)	46.9(n=354)	100.0	100.00

Sources: Data for landing sites from field survey
and national data calculated from SPEC -GSO, 1994.

As part of the "Standard of Living" component of the socio-economic survey, 148 respondents answered questions on the age, gender and kinship relationship of all persons living in the same household unit. The results are summarized in Table 6-29 and Fig. 6-55.[10] In Table 6-29 they are also compared with the average figures for Viet Nam.

Unlike for Viet Nam as a whole, in the five landing sites the gender imbalance is slightly in favor of males. This is possibly a result of the in-migration of male fishing boat crew members. Of the total population of 755 persons reported for the 148 responding households, 53.1% are male and 46.9% female.

As is shown clearly in Fig. 6-55, in the sampled population is young. In

10 Although samples of both fisheries and non-fisheries households were taken, sub-populations are not distinguished here since the differences between them were found to be insignificant. For the same reason, data are not presented separately for each landing site.

the five landing sites 42.6% of the total sampled population is less than 20 years-of-age, and 63.9% less than 30 years old. Yet, these rates are somewhat less than the national average rates of 48.5% and 64.6%, respectively. In terms of both the provision of formal education and employment generation such figures present an enormous burden to Viet Nam.

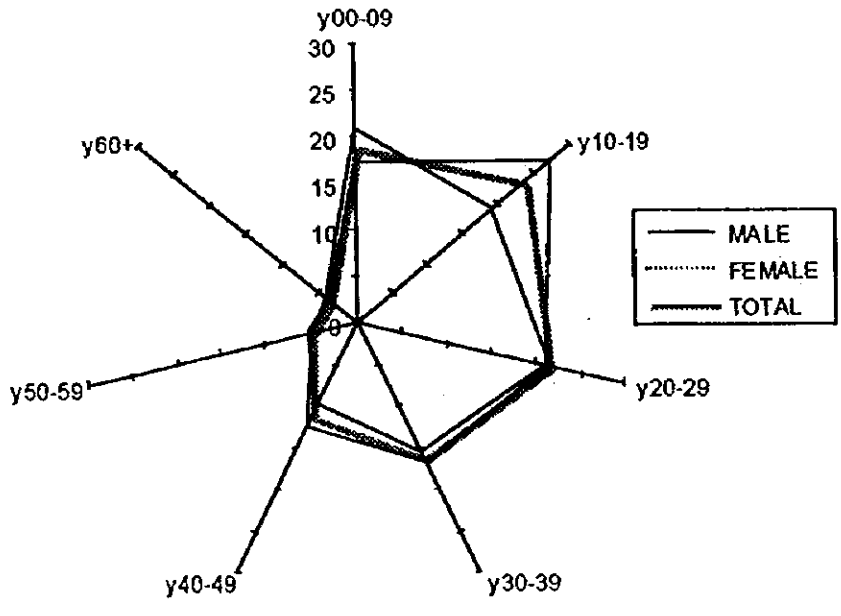

Fig. 6-55 Percentage Distribution of Population by Dicennial Age Groups in the Five Sites Surveyed

Further, 80.6% of the total sampled population is less than 40 years-of-age. This may have serious implications for investment in marine fisheries development, since it means that the number of persons with either the capital to invest directly, or the ability to extend credit in such undertaking is limited relative to the potential demand.

Despite those rates of urbanization in the surveyed areas, the great bulk of the population of Viet Nam remains in rural areas, where 80.0% of households are engaged in agriculture, as are 83.2% along the North-Central

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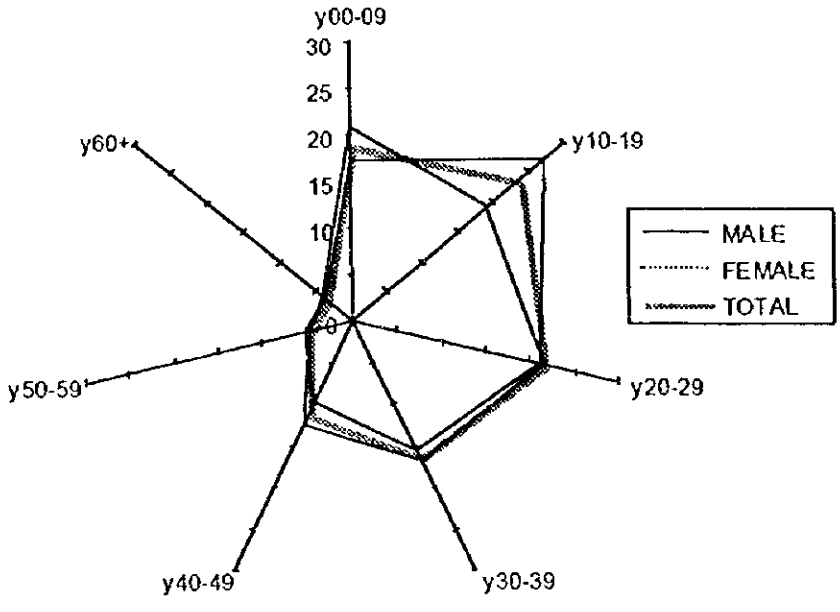

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Despite those rates of urbanization in the surveyed areas, the great bulk of the population of Viet Nam remains in rural areas, where 80.0% of households are engaged in agriculture, as are 83.2% along the North-Central

Coast and 74.4% along the South-Central Coast (Table 6-30). All other occupational categories of households are relatively insignificant in comparison. Only 1.9% of households in Viet Nam are specialized in fisheries, as are 3.5% along the North-Central Coast and 6.0% along the South-Central Coast[11].

Table 6-30 Rural Households in Viet Nam and along the North- and South-Central Coasts by Principal Occupational Category (Unit:%)

Household category	National	North-Central Coast	South-Central Coast
Agricultural	80.00	83.16	74.37
Commercial	3.20	2.03	4.43
Fisheries	1.92	3.53	6.02
Industrial/Craft	1.33	1.36	1.39
Services	1.18	0.85	1.54
Construction	0.27	0.23	0.43
Forestry	0.15	0.12	0.22
Other	12.00	8.69	11.66
TOTAL	100.00	99.97	100.06

Source: Calculated from data in GSO (1995)

In terms of the demographics of households, as can be see from Tables 6-31, 32 and 33, for Viet Nam as a whole and along the North-Central and South-Central Coasts, fisheries households consistently have the highest average number of persons per household, the highest average numbers in the 16 - 60 years age-groups, and the highest average dependency rates of any category of household. All rates are highest in the South-Central Coast Region (Table 6-33). In Table 6-34 the same statistics as presented at the national and regional levels in the preceding three tables have been calculated for the five landing sites surveyed, for both fishing and non-fishing households The averages for all five landing sites show little difference between the two sampled populations in

11 The original data do not distinguish marine fishery households from those engaged in freshwater fisheries and aquaculture.

Coast and 74.4% along the South-Central Coast (Table 6-30). All other occupational categories of households are relatively insignificant in comparison. Only 1.9% of households in Viet Nam are specialized in fisheries, as are 3.5% along the North-Central Coast and 6.0% along the South-Central Coast[11].

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11 The original data do not distinguish marine fishery households from those engaged in freshwater fisheries and aquaculture.

Table 6-32 Persons per Household by Principal Occupational Type along the North-Central Coast

Occupational Category	Average No. Persons Per Household	Average No. Persons Aged16-60 Per Household	Average No.Persons Working Per Household	Dependency Rate Per Household
Agricultural	4.8	2.3	2.1	2.6
Commercial	4.7	2.4	2.1	2.6
Fisheries	5.4	2.7	2.4	3.0
Services	4.8	2.5	2.2	2.6
Construction	4.9	2.5	2.3	2.6
Forestry	4.9	2.6	2.1	2.8
Other	4.3	2.1	1.6	2.7
Average	4.7	2.3	2.1	2.6

Source: Calculated from data in GSO (1995)

Table 6-31 Persons per Household by Principal Occupational Type in Viet Nam

Occupational Category	Average No. Persons Per Household	Average No. Persons Aged16-60 Per Household	Average No.Persons Working Per Household	Dependency Rate Per Household
Agricultural	4.8	2.5	2.3	2.5
Commercial	4.7	2.7	2.4	2.3
Fisheries	5.5	2.8	2.6	2.9
Services	4.6	2.6	2.4	2.2
Construction	4.9	2.8	2.5	2.4
Forestry	5.2	2.8	2.4	2.8
Other	4.3	2.4	2.1	2.2
Average	4.8	2.5	2.3	2.5

Source: Calculated from data in GSO (1995)

terms of average number of persons per household, average number of persons aged 16 - 60 per household, average number of persons working per household, aged-based dependency rates, work-based dependency rates. Indeed, in all these categories there is often greater variation among the fishing household Table 6-

Table 6-32 Persons per Household by Principal Occupational Type along the North-Central Coast

Occupational Category	Average No. Persons Per Household	Average No. Persons Aged1 6-60 Per Household	Average No.Persons Working Per Household	Dependency Rate Per Household
Agricultural	4.8	2.3	2.1	2.6
Commercial	4.7	2.4	2.1	2.6
Fisheries	5.4	2.7	2.4	3.0
Services	4.8	2.5	2.2	2.6
Construction	4.9	2.5	2.3	2.6
Forestry	4.9	2.6	2.1	2.8
Other	4.3	2.1	1.6	2.7
Average	4.7	2.3	2.1	2.6

Source: Calculated from data in GSO (1995)

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Commercial	4.7	2.7	2.4	2.3
Fisheries	5.5	2.8	2.6	2.9
Services	4.6	2.6	2.4	2.2
Construction	4.9	2.8	2.5	2.4
Forestry	5.2	2.8	2.4	2.8
Other	4.3	2.4	2.1	2.2
Average	4.8	2.5	2.3	2.5

Source: Calculated from data in GSO (1995)

terms of average number of persons per household, average number of persons aged 16 - 60 per household, average number of persons working per household, aged-based dependency rates, work-based dependency rates. Indeed, in all these categories there is often greater variation among the fishing household Table 6-

Table 6-33 Persons per Household by Principal Occupational Type along the South-Central Coast

Occupational Category	Average No. Persons Per Household	Average No. Persons Aged16-60 Per Household	Average No. Persons Working Per Household	Dependency Rate Per Household
Agricultural	4.9	2.6	2.4	2.5
Commercial	4.8	2.7	2.4	2.4
Fisheries	5.7	2.9	2.6	3.1
Services	5.0	2.7	2.5	2.5
Construction	5.1	2.7	2.5	2.6
Forestry	5.0	2.5	2.3	2.7
Other	4.0	2.1	1.9	2.1
Average	4.8	2.5	2.3	2.5

Source: Calculated from data in GSO (1995)

populations in the five landing sites than among the two populations within a single landing site.

Comparing the survey data on the five landing sites with those for the entire nation (Table 6-31) shows that the average number of persons per fisheries household (5.5) exactly equals the national average; that the average number of persons aged 16 - 60 per fisheries household (3.2) is slightly higher than the national average (2.8); that the average number of persons working per fisheries household (2.4) is slightly below the national average (2.6); and that the aged-based dependency rate of 2.3 in the five landing sites is lower than the national average of 2.9. (No national figures are available to permit a comparison of the fisheries household work-based dependency rate of 3.1). As can be seen, in Da Nang is closely comparable with the national average in almost all respects.

Table 6-33 Persons per Household by Principal Occupational Type along the South-Central Coast

Occupational Category	Average No. Persons Per Household	Average No. Persons Aged16-60 Per Household	Average No. Persons Working Per Household	Dependency Rate Per Household
Agricultural	4.9	2.6	2.4	2.5
Commercial	4.8	2.7	2.4	2.4
Fisheries	5.7	2.9	2.6	3.1
Services	5.0	2.7	2.5	2.5
Construction	5.1	2.7	2.5	2.6
Forestry	5.0	2.5	2.3	2.7
Other	4.0	2.1	1.9	2.1
Average	4.8	2.5	2.3	2.5

Source: Calculated from data in GSO (1995)

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Table 6-34 Persons per Household in Fishing and Non-Fishing Households in the Five Landing Sites Surveyed

Landing Site	Average No. Persons Per Household	Average No. Persons Aged 15-60 Per Household	Average No. Persons Working Per Household	Age-Based Dependency Ratio Per Household	Work-Based Dependency Ratio Per Household
Vung Tau (F)	6.1	2.8	1.5	3.3	1.5
Vung Tau (N-F)	6.2	3.2	1.8	3.0	1.8
Phan Thiet (F)	6.3	2.0	2.9	2.0	3.4
Phan Thiet (N-F)	4.9	1.9	2.8	1.9	2.1
Nha Trang (F)	4.3	3.1	2.3	1.2	2.0
Nha Trang (N-F)	3.8	3.1	1.1	0.7	2.0
Da Nang (F)	5.4	2.8	2.4	2.8	3.0
Da Nang (N-F)	4.0	3.1	2.7	3.1	1.3
Dong Hoi (F)	5.0	3.1	2.3	3.1	2.3
Dong Hoi (N-F)	4.3	3.3	2.0	3.3	2.0
Average (F)	5.5	3.2	2.4	2.3	3.1
Average (N-F)	5.0	3.1	2.0	1.9	3.0

Source: Computer from field survey data.

Table 6-34 Persons per Household in Fishing and Non-Fishing Households in the Five Landing Sites Surveyed

Landing Site	Average No. Persons Per Household	Average No. Persons Aged 16-60 Per Household	Average No.Persons Working Per Household	Age-Based Dependency Rate Per Household	Work-Based Dependency Rate Per Household
Vung Tau (F)	6.1	2.8	1.5	3.3	1.5
Vung Tau (N-F)	6.2	3.2	1.8	3.0	1.8
Phan Thiet (F)	6.3	2.0	2.9	2.0	3.4
Phan Thiet (N-F)	4.9	1.9	2.8	1.9	2.1
Nha Trang (F)	4.3	3.1	2.3	1.2	2.0
Nha Trang (N-F)	3.8	3.1	1.1	0.7	2.0
Da Nang (F)	5.4	2.8	2.4	2.8	3.0
Da Nang (N-F)	4.0	3.1	2.7	3.1	1.3
Dong Hoi (F)	5.0	3.1	2.3	3.1	2.3
Dong Hoi (N-F)	4.3	3.3	2.0	3.3	2.0
Average (F)	5.5	3.2	2.4	2.3	3.1
Average (N-F)	5.0	3.1	2.0	1.9	3.0

Source: Computer from field survey data.

(2) Social Organizations

2-1. Provincial and District Level

At the provincial, district and commune levels, the People's Council formulates provincial and lower level policy, together with the People's Committee and the Communist Party. The administrative functions of the People's Council are performed at the provincial, district and commune levels by the People's Committee. Each People's Committee has a number of specialized services that implement all laws and policies, such as for fisheries, industrial development, family planning, and the like. Linkage from the commune level to the national level is via the People's Committee.

2-2. Commune Level

It is important to clarify commune level administration and management, since the commune is the basic rural administrative unit and the administrative system has undergone major changes since the introduction of *Doi Moi*, in the 1980s.

Before *Doi Moi* the commune-level administrative and management structure consisted of the following five elements:

(1) Communist Party Committee;

(2) Cooperative;

(3) Commune Government;

(4) People's Council; and

(5) Mass Organizations (principally the Fatherland Front, the Youth Union and the Women's Union).

However, in reality the principal local planning and administrative body at the commune level was the local Communist Party Committee; leaders of other local organizations were just advisers. For economic activities, the entire population of a commune was assigned to a Production Team, based on residential location, and worked for the Cooperative. Members of a Production Team received a salary based on a system of "work points" paid by the

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Cooperative.

Since the introduction of *Doi Moi* the main change has occurred in the role of the Communist Party. It no longer has a decision-making role in civil affairs, having handed it over to the elected commune government of the People's Council.

Representation on the People's Council varies among communes, reflecting local conditions.

Since *Doi Moi* the People's Committee performs the routine management of commune affairs, having inherited that role from the Cooperative. It is empowered to implement the administrative, political and economic decisions of the People's Council, with the directors of its departments mirroring the functions of ministers at the national level. Its main functions are the management and development planning of land and natural resources, tax collection, social welfare, and preparation of development plans and projects for the approval of the People's Council.

2-3. Village Level

Villages within a commune have their own administrative structure. Villagers elect a Chairman for a five-year term. The remainder of the village administrative team consists of the Party Secretary, leaders of the village branches of the Mass Organizations, and local members of the People's Council. Since implementation of *Doi Moi*, power at the village level has increased since Village Chairmen are now also members of the Commune Government.

Although major improvements have occurred in the lower levels of local government under *Doi Moi*, salaries for governemnt employees consume a large portion of communal budgets thereby reducing the amounts of money available for development and other projects. Since salaries are often so low that officials must seek other employment to supplement them. This could be a major constraint on developmental management at the smallest administrative unit. Further, the levels of education and general experience among members of

communal governments are often low. The poor quality of fisheries and other statistics is an example of the consequence of low educational levels.

2-4. Cooperatives

The former public sector cooperatives have now been largely disbanded. The MOF has closed a department formerly in charge of cooperatives. Collectives in Viet Nam took two forms: "Cooperatives" (*Hop Tac Xa*) or "Production Collectives" (*Tap Doan San Xuat*). In the former, assets and equipment were owned by the community and typically involved several fishing units, whereas in the latter they were owned by individuals and generally involved a single fishing unit. Cooperatives were predominant in the northern provinces, whereas Production Collectives occurred mostly in the South.

In the North, a large cooperative was established for each fishing village. Since everything belonged to these multi-purpose cooperatives, people worked without much economic incentive. After 1975 the same approach was tried in the South, but, for example, an "input" cooperative at Long Hai Village, Ba Ria-Vung Tau Province had existed in name only. Low interest loans, cheap gear and subsidized engines and hulls were provided, but fishers retained and sold fish on the open market. Because inputs were cheap while the open market rewarded them with high prices, the local fishery developed very fast in Long Hai.

This basic pattern of fisheries cooperative failure recurs in all five areas surveyed: most cooperatives failed because fishers withheld their catches to avoid cooperative controlled prices and sold them either to traditional market intermediaries or at sea, at higher market prices. At Phan Thiet, for example, the government-established "multi-purpose" cooperatives in the early-1980s started to collapse by 1985.

2-5. Mass Organizations

Mass organizations are the principal social service organizations in Viet

Nam. The main ones in rural areas are the Fatherland Front, the Women's Union, the Farmers' Association, the Viet Nam Fisheries Association, and the Old People's Association.

Since *Doi Moi* the Fatherland Front has a major role in the parliamentary election process and is widely involved in social matters. The Women's Union is involved mainly in the improvement of household economies through starting income-generating activities, self-help programs, and small-scale credit schemes for women, as well as family planning and health programs. In fishing communities the Women's Union also involves in the making of fishing nets. The Farmers' Association, newly established since *Doi Moi*, is of little importance in fishing communities. The Viet Nam Fisheries Association was established by a Government Decree in 1992. Its objective is to promote the voluntary unity of fishers for mutual economic and technical support and their legal protection. Until now, however, there has been very little success in the organizing of individual fishers. The Old People's Association undertakes mutual assistance and welfare work among its membership and also sponsors self-help economic programs.

2-6. Local Fisheries Management

There is a long tradition of community-based fisheries management in some parts of Viet Nam. Rules have been transmitted orally through the generations, and based on them fisheries management tasks performed by the local community. In Central and Southern Viet Nam, in particular, paralleling the situation with agricultural settlements, marine fishing villages erected shrines which served as a focal point for local fisheries management.

Although varying considerably according to locality, the principal aspects of traditional local fisheries management are mutual assistance among fishers, the behavior, rights and obligations of fishing boat owners, captains and crew members, disposal of the catch, rules governing fishing operations, and

sanctions or punishment[12].

The principal authority vested in local management has been that to conciliate fisheries conflicts, the resolution of which is not stipulated in current local rules or higher laws. However, its power is limited in that it can be exercised only at the request of either fishing boat owners or fishers. Local management forwards impartial opinions to the Village Council to assist the latter in its decision-making. It is important to note that the powers of management are tightly circumscribed.

Other rules govern the disposal of the catch. Boat-owners, captains and crew members are entitled to sell the catch at the landing site for prices that are published daily. Fish buyers are strictly forbidden from going onboard fishing boats; they must evaluate the catch either on the wharf or from their junks alongside the fishing boat. The giving and asking for free fish is strictly forbidden at the landing site, and is a punishable offense. Gear rules are also specified. Detailed rules are applied to the main gear types used. These pertain mainly to eligibility, seasonality and profit-sharing.

2-7. Informal Groups

Small groups based solely on the mutual interest of their membership are limited in fishing communities to those for fishing boat financing and operations. Such small groups are formed either on an extended family basis or by a group of friends from the same fishing community, or a by a combination of both. Under present conditions, which have prevailed since 1989, the individual household is the unit responsible for investment and property management; most families wish to be the sole owners of their fishing assets and most recall all too clearly their fairly recent experiences with the failure of fishing cooperatives established by the government and which they were compelled to join with no

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12 For a definition and obligations of boat-owners, definition and rights of crew members, definition and rights of captains, and behavior and duties of captains and crew members see *Labor Recruitment.*

opportunity for individual choice.

In Viet Nam rural society in general and fishing communities in particular remain strongly traditional, although this varies considerablly both within and among the regions studied. In addition to belief systems this is reflected strongly in the structure and behavior of the family. Settlements are characterized by both multi-nuclear and extended family dwelling patterns[13]. Relations between a father and his sons are close whereas those between or among brothers seem more distant. For example, whereas many fathers fish with their sons fewer of cases of male siblings working together were recorded during the survey. In fact, uncles and nephews more frequently fish together than do brothers.

(3) Standards of Living

3-1. Ownership of Agricultural Land

Although fishing households also own agricultural land, the amount owned is generally far less than for other categories of household (Table 6-35). As shown, at the national level fishing households own the lowest amount of total and annual crop land, and have the lowest *per capita* ownership rates in both categories of land. A similar land ownership pattern occurs along the North-Central Coast (Table 6-36), except that in that region "commercial" families also rank at a similar low level. Along the South-Central Coast fishing households rank lowest in all categories of agricultural land ownership (Table 6-37).

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13 A multi-nuclear pattern is where sons live in their own "nuclear" family households around or close to their father's house, whereas an "extended family" patterns occurs where three or more generations inhabit the same household.

Table 6-35 Agricultural Land Ownership by Rural Households in Viet Nam (m^2)

Household Type	Total Agricultural Land (m^2)	Annual Crop Land (m^2)	Average per Person (m^2)	Annual Crop Land per Person (m^2)
Average	4,143	3,574	869	750
Fishing	477	365	87	66
Farming	4,984	4,356	1,034	903
Forestry	4,415	3,619	856	702
Industrial/craft	1,039	865	215	179
Construction	774	550	158	112
Commerce	779	520	165	110
Services	743	548	160	118
Other	900	477	209	111

Source: GSO (1995)

Table 6-36 Agricultural Land Ownership by Rural Households along the North-Central Coast

Household Type	Total Agricultural Land (m^2)	Annual Crop Land (m^2)	Average per Person (m^2)	Annual Crop Land per Person (m^2)
Average	2,591	2,480	550	526
Fishing	189	185	38	34
Farming	3,002	2,908	631	611
Forestry	1,757	1,227	362	253
Industrial/craft	501	474	104	98
Construction	333	316	69	65
Commerce	195	170	42	37
Services	235	216	49	45
Other	828	468	210	118

Source: GSO (1995)

3-2. Livestock and Other Agricultural Assets

In Viet Nam households not classified as "agricultural" also own livestock and other agricultural assets. But, as shown in Table 6-38, fishery households possess a very small percentage of the total national stock of livestock and other

Table 6-35 Agricultural Land Ownership by Rural Households in Viet Nam (m^2)

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Table 6-37 Agricultural Land Ownership by Rural Households along the South-Central Coast

Household Type	Total Agricultural Land (m²)	Annual Crop Land (m²)	Average per Person (m²)	Annual Crop Land per Person (m²)
Average	3,192	2,978	662	617
Fishing	306	236	53	46
Farming	4,131	3,877	849	797
Forestry	2,377	1,472	479	297
Industrial/Craft	612	538	119	105
Construction	673	298	133	118
Commerce	471	378	98	78
Services	500	405	101	82
Other	487	368	121	91

Source: GSO (1995)

Table 6-38 Percentage Ownership of Livestock and Other Agricultural Assets by Fishing Households in Vietnam and the Central Coast Regions

	Viet Nam	North Central	South Central
Buffalo	0.05	0.03	2.85
Cattle	0.36	0.67	0.12
Pigs	0.74	1.49	0.52
Poultry	4.60	0.80	2.06
Large Tractor	0.69	1.89	1.41
Small Tractor*	1.07	7.78	2.54
Threshing Machine*	0.08	0.04	0.08
Rice Mill	0.24	0.49	0.50

Source: Calculated from data in GSO (1995)

Table Note: * as percentage of capacity, not units.

agricultural assets. For buffalo, however, along the North- and South-Central coast fishery households rank lowest in the possession of the animal. For cattle, along the North Central Coast, fishery households rank second to "agricultural" households in the ownership of cattle, while along the South-Central Coast fishery households rank lower. Pig-raising is a commonplace household activity

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for supplementary incomes in Viet Nam. The importance of pig-raising is greater among fishery households along the North- and South-Central Coast, where only "agricultural", "other" and "commercial" households rank higher. Like pigs, poultry raising is widespread among non-agricultural rural households though the percentage is relatively low for fishery households.

Table 6-39 Average *Per Capita* Annual Expenditures and Potential Savings Rates for Viet Nam, Coastal Regions and the Provinces Surveyed (USD)

Location	Income	Expenditure	Potential Savings (%)
VIET NAM	130	123	5.3
North-Central Coast	89	87	2.2
Quang Binh	94	86	8.5
South-Central Coast	120	110	8.3
QN Da Nang	124	122	1.6
Khanh Hoa	139	130	6.4
Binh Thuan	140	133	5.0
N-East South Coast	246	229	6.9
Ba Ria-Vung Tau	185	184	0.5

Source: Computed from data in State Planning Committee - GSO (1994) and GSO 1995(b)

Table Note: Potential savings expressed as a percentage of total income

3-3. Household Economies in Viet Nam

In Viet Nam, as shown in Table 6-39, household income and expenditure have a tendency to increase geographically from north to south. The national averages are USD 130 for household income and USD 123 for household expenditure. Along the North-Central Coast, including Quang Binh Province, and along the South-Central Coast as far south as Quang Nam Da Nang Province, both rates are below the national averages, while from Khanh Hoa Province southwards, rates exceed the national averages. (A slight distortion is introduced into this southwards increase by the figures for the North-East South Coast Region, reflecting the economic impact of Ho Chi Minh

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