

Socio-economic Characteristics of the Skipjack Fishery in Indonesia

Eddy MANTJORO¹⁾ and Chikashi KATAOKA²⁾

Abstract

The skipjack fishery was introduced to Indonesia by Japanese fishermen and developed by the local fishermen and entrepreneurs in their own way.

At present, Indonesia is the fourth largest producer of skipjack-tuna in the world. Although the bulk of catch is taken by the small scale skipjack-tuna fishery which plays an important role in Indonesian fisheries, little is known about the socio-economic situation of this fishery. For this reason, this study aims to explore the socio-economic characteristics of the small scale skipjack fishery in North Sulawesi, especially in Bitung which is the main fishing base.

Traditions dominate this fishery. The structure is of the typical small scale fishery where the exploitation rate remains far below the MSY, fish middlemen control the domestic marketing, and laborer's attitude and way of life adhere essentially to subsistence.

Key words: Skipjack fishery in Indonesia, The *PIR* system, Yield share system, Fish marketing, Vessel labor union.

1. Introduction

Today, Indonesia is the fourth largest producer of skipjack-tuna in the world following Japan, the USA, and Spain. The production of skipjack-tuna in Indonesia increased from 135,000 tons in 1987 to 143,000 tons in 1988 and reached about 155,000 tons in 1989 which is equivalent to 6% of world's production. At the same time, volume for export excluding canned tunas increased from 34,000 tons in 1987 to 42,500 tons in 1988.

The main overseas market is Japan for *Sashimi* quality of both fresh and frozen. The canned skipjack-tuna is exported to the USA and Europe, while fresh, boiled, and smoked tuna are sold in the domestic market. The price in the international market differs according to species and quality of fish. In early 1990, the price of *Sashimi* quality varied from US\$1,000 to US\$4,700/ton on c.i.f. basis, the price of canned skipjack-tuna ranged between US\$850 —

1) Laboratory of Fisheries Economics and Business, Faculty of Fisheries, Samratulangi University, Indonesia

2) Department of Marine Social Science, Faculty of Fisheries, Kagoshima University

1,200/ton, while it varied from US\$485 to US\$1,200/ton depending on location and season in the domestic auction market.

These figures may give the impression that skipjack-tuna is produced by large scale fishing vessels. However, about 75—85% of the total production is caught by the small scale skipjack-tuna fishery, of which most are concentrated in East Indonesian Waters, i.e. from Sulawesi to Maluku and Irian Jaya.

Despite the fact that the small scale skipjack fishery plays an important role in Indonesian fisheries, few socio-economic studies have been conducted to date. This study focuses on North Sulawesi Province, especially in Bitung (see Map) as its main fishing base. It represents the skipjack fishery elsewhere in Indonesia in which socio-economic and technological characteristics are similar.

2. Historical Review

The skipjack fishery was introduced to Indonesia in Maluku in 1905 and to Sulawesi in 1918 by Japanese fishermen though these were unsuccessful. Koo Hara, a Japanese fisheries explorer of Kagoshima Prefecture, introduced it to Bitung in 1927 and at the same time to Ambon of Maluku on his return to Japan.

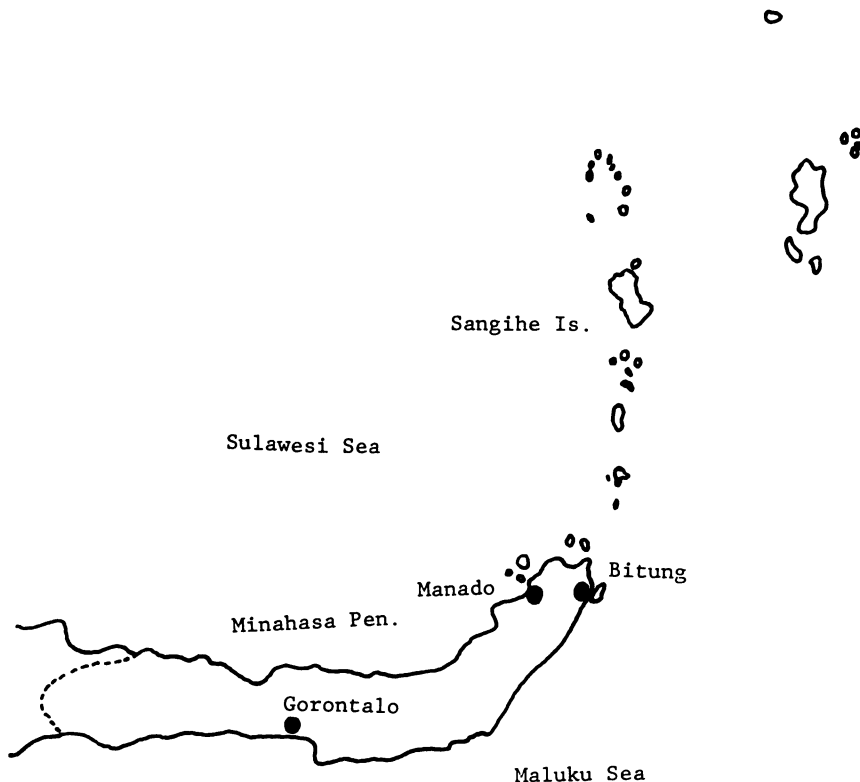


Fig. 1. Map of North Sulawesi.

In 1935 the Dutch established a skipjack fishing company named Institut voor de Zee Vissert in Bitung about 45 km east of Manado City. During the Japanese occupation in the war, this company was expropriated and under the Japanese administration their skipjack fishing technology and management was transferred to the local fishermen. As a consequence, the fishery became completely similar to that of Japan.

After Indonesia proclaimed her independence, the company was taken over by the government, but its board of director remained in the hands of the Dutch. Since 1951 the management of the company had been handled fully by Indonesians.

In 1960 when the Indonesian Government nationalized all foreign companies, including skipjack fishing company, the name of Institut voor de Zee Vissert was changed to Marine Fisheries Corporation (Yayasan Perikanan Laut). Government regulation No. 51 in 1961 enforced the name change again to Indonesian Fisheries Development Co., Ltd. (PT Usaha Pembangunan Perikanan Indonesia). In 1970 the government issued regulation No. 52 renaming the company to East Indonesian Fishery Co., Ltd. (PN Perikani Timur) with branches in Ujung Pandang, Ternate, Ambon, and Sorong. After that, Bitung became the only skipjack fishing base in East Indonesia. Before 1971 the skipjack fishing boats were mostly of 20 GT wooden boats and two or three private skipjack fishing companies started their operations with one or two boats each.

In 1972 the government expanded on capital investment to the skipjack fishery in North Sulawesi up to US\$150 million, of which 34% was from the government, 34% from the World Bank, 23% from the Bank Indonesia, 9% from the Bank Rakyat Indonesia. The investment resulted in a cold storage of 600 tons capacity, an ice plant, a shipyard, a fishing port, an oil tank, and 28 fishing boats of 30-40 GT, a longline vessel of 100 GT, and a transportation vessel of 300 GT.

In 1973, based on government regulation No. 16, the name of the company changed to North-central Sulawesi Fishing Co., Ltd. (PT Perikani Sulutteng) with a branch office in Jakarta. Meanwhile, the former branches were reorganized into independent skipjack-tuna fishing companies in Kendari, Ambon, Sorong, and Ternate. During the 1970's several private skipjack fishing companies were established mostly by Chinese entrepreneurs.

The last change occurred in 1986 when the government decided to promote the people's nucleus company system (Perusahaan Inti Rakyat or *PIR*). This system was first applied to plantation companies and then extended to fisheries which is called fisheries nucleus company (Perikanan Inti Rakyat or *PIR*). With this policy, a company can serve as a parent company to several or hundreds of household fishermen as its rank and file. In North Sulawesi, PT Perikani Sulutteng became the nucleus company serving about 500 canoe fishermen.

3. Structure of the Fishery

3.1 Definition and Classification

Bewilderment may arise in attempting to explain the small scale fishery which has different meanings based on the economic progress of each country. What is called small scale in de-

veloped countries may appear medium or even large scale in the eye of people in developing countries.

For statistical and developmental planning purposes, the government categorizes fisheries into the following sections.

A. Household management (Artisanal)

1. Fishing without a boat
2. Fishing with an un-motorized boat
3. Fishing with an outboard motorboat
4. Fishing with an inboard motorboat less than 10 GT

B. Enterprise management (Industrial)

1. Small scale fishery with a boat less than 30 GT
2. Medium scale fishery with a vessel of 31-99 GT
3. Large scale fishery with a vessel beyond 100 GT

By this classification, the term of small scale fishery refers to enterprises operating a boat of 10-30 GT, while fishermen who use canoe or motorboat less than 10 GT are interpreted as a household fishery which is commonly recognized as a traditional or artisanal fishery. But, in many cases, and in this paper, the household fishery is regarded also as a small scale fishery and it is actually more appropriate. The skipjack fishery involves both household and enterprise managements.

The difference between the household fishery and the small scale enterprise fishery is that the former is free from any kind of legal regulation, while the latter should operate under regulations in terms of vessel certificate, business license, fishing voyage permit etc. issued by the provincial governor, although this fishery is free from the fishing area. On the other hand, medium and large scale fisheries are under regulations issued either by the provincial governor or Minister of Agriculture, including entry permit to the defined fishing area.

3.2 Gear and Technology

Fishing gear commonly used by the small scale skipjack-tuna fishery in North Sulawesi consists of five types, i.e. single hook surface long-line (*Pancing tonda*), single hook vertical long-line (*Pancing tegak*), local pole and line (*Funae*), multipurpose fishing method (*Serbaguna*), and common pole and line (*Huhate*). The composition of this gear in Bitung is shown in Table 1.

The single hook surface long-line is common for skipjack and other tuna species, while the single hook vertical long-line captures mainly bluefin and big-eye tunas but sometimes skipjack too. These are non-motorized types of fishings.

Table 1. Number of fishing gear for skipjack-tuna in Bitung

Fishing gear	1984	1985	1986	1987	1988	1989
<i>Pancing tonda</i>	355	355	361	148	154	154
<i>Pancing tegak</i>	1,222	1,222	1,230	1,230	1,211	1,211
<i>Funae</i>	8	12	14	17	17	19
<i>Serbaguna</i>	9	11	11	15	15	16
<i>Huhate</i>	48	40	37	57	58	63

Source: Internal materials of Fisheries Services Office of Bitung, 1990

Funae is the skipjack fishing technology in which local and Japanese techniques merged. It is composed of a 5-10 GT boat with an outboard motor using pole and line with 6-12 crew. *Funae* originated in Ternate and entered in Manado in 1920 and soon expanded to Likupang and Ganga Island in North Sulawesi. *Funae* is motorized since the 1970's.

Funae fishing differs from that of common pole and line (*Huhate*). *Huhate* derives the school of skipjack in front of the vessel at fishing time, while *Funae* at the rear of the boat. Thus, *Funae* fishermen must concentrate at the rear of the boat, while *Huhate* fishermen in front of the vessel. The fishing time of *Funae* is longer than that of *Huhate* due to the school staying longer around the boat. In *Funae* fishing the outboard engine is turned off soon after the boat reaches the school, while in *Huhate* the engine is kept running noisily during the fishing time which easily disperses the fish. As a result, the catch of *Funae* is sometimes greater than that of *Huhate*.

The multipurpose fishing method, *Serbaguna*, has been developed by local fishermen since 1983 in an effort to solve the problem of lean or failed skipjack fishing trips. The boat is designed in such a way that two or three kinds of gear can be used during a fishing trip. The main purpose is to capture skipjack by pole and line, but at the same time they can also carry purse seine and gill net or other fishing gear. With this fishing technique, their catch has become stable.

Huhate is the local name of a common pole and line fishing which was introduced from Japan. Most *Huhate* are of wooden 20-30 GT vessels and some have installed ice rooms.

3.3 Type and Size of the Fishery

There are four types of operation of the small scale skipjack fishery in North Sulawesi under the household and enterprise management.

A. Household management

1. Individual operation
2. Group operation

B. Enterprise management

1. Multipurpose operation
2. Common pole and line fishery

In the individual operation type, the fishermen fish using canoe of about 3 m in length and 0.3 GT in capacity. The gear is single hook surface or vertical long-line which is locally called *Pancing tonda* or *Pancing tegak* respectively. The production ranges between 5—20 kg per trip with a value of about Rp. 20,000—60,000. This earning is relatively high by Indonesian economic standards, but it does not elevate their living conditions because once they earn income enough for living needs, they tend to suspend fishing until all previous income is exhausted.

The group operation type is of local origin. The catch is divided on equal basis among the crew. In the case of individual ownership, 40% of the income goes to the owner and 60% is shared equally among the participants. At present, this type of operation has been replaced by *Funae*.

The multipurpose operation type is slightly larger than *Funae*, i.e. using a boat of 10-20 GT with 12—18 crew and certain certificate and license are required.

The common pole and line fishery is widely known elsewhere and its gear and technology

are almost similar. The Indonesian Government defines the small scale skipjack fishery as those operating a vessel of less than 30 GT. This size of boat dominates and only a few skipjack fishing vessels of more than 30 GT exist in North Sulawesi.

3.4 Management Pattern

The management of the small skipjack fishery can be classified into three patterns; traditional management, delegated management, and a nucleus company.

The household skipjack fishery used to work under traditional management. This fishery is operated based on the needs of the daily diet and is free from any legal regulation and taxes. The government could not impose taxes on them since there is no basis for tax determination. Fisheries income and expenditure are never recorded, so there is no profit or loss in their minds. Sometimes they feel profitable when they earn much money from the catch, even if they expend more than that income. At present, most of them become the rank and file of the nucleus company.

The delegated management is mostly applied to the private skipjack fishing companies. The owner delegates his vessel to an experienced fisherman on a contract or income share basis. This fisherman serves as a manager (*Pengurus*) who manages the marketing of its catch and reports to the owner weekly. Usually a fish grossier is appointed as a *Pengurus* because he has an established marketing route for the catch. Operation cost is born by the *Pengurus*, while depreciation and major maintenance costs are paid by the owner. The *Pengurus* performs the business, but control is in the hands of the owner through weekly report and sometimes he has informers among the crew.

In the case of an owner with 6 vessels, he delegates 4 vessels to a *Pengurus* based in Belang 85 km south of Bitung and delegates 2 vessels to another *Pengurus* in Bitung. The owner lives in Bitung and does not take care of his vessels since he has main business like a shop, a trade, and other big companies. The two *Pengurus* who manage 4 or 2 vessel delegate each vessel to a sub-*Pengurus* hence, a total of 6 sub-*Pengurus*

Some sub-*Pengurus* serve as fish brokers, but others delegate fish marketing to a fish broker. Therefore there are three or four levels of delegation to manage the fishing vessels.

People's nucleus company was initially applied to the plantation enterprises in 1986 and extended to fisheries which is called Perikanan Inti Rakyat (*PIR*) next year. Each fisheries nucleus company serves several tens or hundreds of skipjack-tuna fishing boats of household management as the rank and file.

The *PIR* system was established to solve the marketing problems of small fishermen. The nucleus company buys the catch from many small fishermen and also provides advance money and fishing materials to them. The advance money serves to supply the fishing operation cost and obliges the fishermen to sell their catch to the nucleus company, while only about 20% of the rank and file avail themselves of it. This implies that they need the nucleus company more for marketing of their catch than for loans.

In North Sulawesi, PT Perikani has been appointed by the government to be a nucleus company for about 500 rank and file fishermen. The *PIR* system is based in Popodu village about 200 km south of Bitung, but only 27% of the fishermen are from this village and the rest come from several fishing villages as temporary fishermen. They come for a period of 3–6

months and then return to their home village with money for their family. In place of their leaves, the other fishermen who returned previously come so that number of fishermen remains constant.

The business relationship between the nucleus company and rank and file fishermen is as follows;

(1) The nucleus company is required to buy the catch of the rank and file fishermen for Rp.650/kg and also provides Payao (*Rumpon*), ice, and other fishing materials. The nucleus company decides the fish price based on the local market price in consultation with the fishermen. If the price is too low, the fishermen will try to sell it to outside buyers at a higher price.

(2) The rank and file fishermen are required to sell their catch to the nucleus company and transfer their catch to the accumulation vessel which the nucleus company sends to the fishing ground and get the record of the volume.

(3) The rank and file fishermen are formed into 75 members. Each group has a leader with whom the nucleus company consults on any business transaction. The grouping only aims to facilitate payment. The nucleus company does not pay the fishermen directly, but to the group's leader who distributes it to their members.

The *PIR* system also aims to minimize the fishing cost of the nucleus company and to increase the productivity of the traditional fishermen. Thus, PT Perikani added the business of buying fish and shifted its marketing strategy by emphasizing the international market.

Recently, some private fishing enterprises have changed their management from a conventional one to a nucleus type of company. Private companies with large capital and an established marketing route are eligible to become nucleus companies through subordinating smaller companies as rank and file companies.

4. Production and Fisheries management

4.1 Resource Exploitation

Indonesian 200 EEZ amounts to 5.8 million km². The Indonesian Directorate General of Fisheries estimates that the maximum sustainable yield (MSY) of skipjack is 275,405 tons and of tuna is 166,302 tons within the waters. The skipjack-tuna resources of Indonesia are the least exploited in the world. Based on the landing data of 1986 the exploitation rate amounts to 30% for skipjack and 23% for tuna.

More than 90% of the skipjack fishing boats are concentrated in East Indonesia, especially in Sulawesi, Maluku, Irian Jaya, Nusatenggara, and Timor. In Sulawesi there are two main fishing bases, namely Bitung of North Sulawesi and Kendari of Southeast Sulawesi. Bitung is the base of the enterprise type of skipjack fishery, while the household skipjack fishery is scattered in almost all the fishing village of North Sulawesi.

The main fishing grounds for skipjack in North Sulawesi are Maluku Sea and Tomini Bay. The more intensive fishing area is Maluku Sea and some vessels extend their operation to Tomini Bay. Sulawesi Sea remains deserted from fishing activity, especially live bait fishing. Most live bait is caught in Maluku Sea by lift net or small purse seine.

Almost all skipjack fishing boats operate in the coastal area on a daily basis. They return to the port with or without catch because live bait, fuel, oil, foodstuff etc. are provided only for a day trip. Therefore, some fishing companies have recently provided *Rumpon* and some fishing vessels are designed as multipurpose fishing (*Serbaguna*) in order to stay out longer and hence, increase the chances of a successful catch.

4.2 Fish Production

The daily production varies according to season and the scale of the fishing boats. In the case of household fisheries it varies 0—20 kg during the lean season and 20—100 kg in the high season, while the enterprise type of fisheries of 20-30 GT vessel fishes 0.5—3.1 tons per day. The volume of skipjack landed in the Bitung fish auction market (*TPI*) linearly increased; 994 tons in 1986, 737 tons in 1987, 1,159 tons in 1988, and 1,402 tons in 1989. These are figures for the production of about 20 private skipjack fishing boats.

Table 2 shows the production of the state fishing enterprise. The labor force remains constant at 70—80% crew and 20—30% land workers. Production decreased from 1982 to 1985 due partly to the economic recession and has been increasing since 1986 owing to the economic recovery and the introduction of the *PIR* system.

Table 2. Production and number of laborer of PT Perikani

Year	Production (Ton)	No.of laborer
1979	2,360	583
1980	3,956	801
1981	3,025	728
1982	3,376	747
1983	2,912	633
1984	1,803	529
1985	1,517	531
1986	1,601	503
1987	4,271	507
1988	4,666	553
1989	4,853	507

Source: Internal materials of PT Perikani Sulutteng, 1990

This production is sold mainly to the export market notably to Japan and the rest to local market. Initially, PT Perikani aimed to minimize the fluctuation of fish supply and fish price in the domestic market through its manipulation of fish supply and buying. But, now the company is more oriented to the overseas market than the local market.

The total annual catch of skipjack in North Sulawesi (Table 3) varied between 6,000—10,000 tons which were landed in five areas; Bitung, Minahasa, Sangihe, Mangondow, and Gorontalo. In Bitung it varied between 3,000—6,500 tons, thus the volume landed in Bitung *TPI* is merely 24—34% of the total catch. This is because some boats unload their catch directly to the canning factory without passing through the *TPI* and others transact on board at sea

or land at the nearest small fishing port.

Since 1988, the catch of skipjack in Sangihe, Mangondow, and Gorontalo has increased because of an increase of the rank and file fishermen in the nucleus company.

Table 3. Skipjack production in North Sulawesi unit: ton

Year	Bitung	Minahasa	Sangihe	Mangondow	G.talo	Total
1981	5,116	1,009	389	324	74	7,474
1982	6,584	824	929	652	331	9,834
1983	5,910	1,188	406	182	403	9,606
1984	4,893	1,249	339	418	416	8,491
1985	2,936	1,208	266	309	199	5,942
1986	3,196	1,265	336	517	283	6,617
1987	3,074	1,423	356	579	674	7,478
1988	3,973	1,328	399	598	853	8,543
1989	4,074	1,280	521	762	681	7,648

Source: Anonymous, 1990

4.3 Fisheries Business

The earning and cost of production varies according to the size of the operation. It is difficult to get the amount due to lack of accurate records. However, with reference to the household fisheries, it is estimated that cost of about Rp.5,000 produces an income of Rp.15,000—30,000 per trip. The cost component of *Funae* and *Serbaguna* is slightly less than that of 20-30 GT vessel belonging to private companies. The earning and cost of skipjack fishery of two sampled private companies is shown in Table 4.

Table 4. Cost and earning of private companies unit: Rp.1,000/month

Earning/Cost	Mina Pelita	Wahyu
1.Earning	23,077	22,500
2.Cost	14,693	16,335
Commission	1,500	1,500
Fuel/oil	2,250	2,250
Ice	1,300	1,675
Crew's wage	5,760	5,341
Bait fish	3,642	3,432
Others	2,133	2,137
3.Profit	8,384	6,165

Source: Internal materials of PT Mina Pelita and PT Wahyu, 1990

Note: Commission is the cost for auction administration and fees related to the permit.

The cost component is relatively simple because they do not deduct fixed cost such as depreciation and maintenance costs and monetary interest payment. Insurance is uncommon in the cost of skipjack fishery, even in the state fishing enterprise, but recently a few companies have begun to incorporate it to their businesses.

The profit is usually used for expansion of the business and welfare of the crew in terms of

bonuses paid once a year at the end of December. One percent of the profit is paid as a special incentive to the vessel officers; captain and chief engineer.

Another transaction commonly done by the vessel owner is buying and selling of the vessel. When its initial capital is collected through fishing, they often sell the vessel slightly below the initial price. For instance, if the initial price amounts to Rp.30 million, two or three years later they intend to sell it for Rp.25 million. This way of replacing it with another new vessel is typical of the Chinese entrepreneurs.

The earning and cost of 14 vessels of 30 GT of PT Perikani are presented in Table 5. The total earning amounted to Rp.1,533 million against the total cost of Rp.757 million with a profit of Rp.776 million. To date, the totals for 1988 are the highest. PT Perikani also operates other medium and large scale boats, *Serbaguna* boats, fish trade, and a dockyard which turn out additional earnings. Of the total earning about 30—40% are derived from the small scale fishing boats.

Table 5. Earning and cost of skipjack fishery of PT Perikani in 1988 unit: Rp.1,000

1.Earning	1,533,730
2.Fixed cost	221,786
Wage	21,636
Bonus	14,129
Medical care	11,120
Vessel/engine maintenance	77,439
Vessel depreciation	48,879
Official travel	10,546
Others	38,037
2.Variable cost	535,476
Daily wage	49,203
Incentive/premium	152,871
Foodstuff	59,131
Fuel/oil	66,042
Fishing gear	57,092
Bait fish	35,845
Others	115,292
3.Total cost	757,262
4.Profit	776,468

Source: Internal materials of PT Perikani Sulutteng, 1990

5. Fish Marketing System

5.1 Fish Consumption and Market Adsorption

Fish consumption in Indonesia varies from 6.5 kg per capita per year in remote rural areas to 70.2 kg in coastal urban areas. The figures in North Sulawesi are 70.2 kg in Manado City and 29.5 kg in rural areas far from the sea which are far beyond the national target of 18.0 kg per capita per year.

On the skipjack consumption in North Sulawesi, since 30% of the catch is exported, the level of local consumption is estimated to be 2.4 kg per capita per year. Recently, however, less skipjack is available for local consumption because more is exported. Shortage of local supply is filled by another fish species.

There are three potential markets for skipjack; local, inter-island, and overseas markets. The inter-island market implies the transportation from Sulawesi to Java and other places in Indonesia, but this market remains unexploited because of the high transportation cost. In a marketing trial by PT Perikani to sell their fish in Surabaya and Jakarta, the cost was slightly beyond the cost to ship to Singapore or Thailand. As a result, they suspended consigning their catch to the big cities in Java Island and concentrated on local and export markets.

Table 6 shows the volume and value of production of PT Perikani in 1988. The volume exported is derived mainly from its own catch, while catch of private fishing boats both of household and enterprise managements meet the local market. The export exceeds the local market because overseas demand for skipjack-tuna has drastically increased since 1988.

Table 6. Market absorption of PT Perikani in 1988

Market	Ton	Million Rp.
1.Export	3,200	5,112
SJ + YF (round)	2,664	4,142
YF (guttet)	536	971
2.Local	961	745
SJ + YF (round)	922	713
Decapitated	30	27
Demersal fish	8	6
3.Total	4,161	5,857

Note: SJ=Skipjack, YF=Yellowfin

Source: Internal materials of PT Perikani Sulutteng, 1990

5.2 Fish Price

The price of skipjack on the local market consists of three strata; at auction, middleman, and retailer. The fish auction market (*TPI*) price in 1988 varied between Rp.550—750/kg in the producing area of Bitung and between Rp.700—820/kg in the consuming area of Manado. Compared to that of 1986, the price has remained relatively unchanged.

On the other hand, the skipjack price for export varied from country to country. The f.o.b. price to Japan was US\$1.00/kg and to the United States about US\$1.15. Recently the demand in Japan has pushed up the price to US\$2.19/kg for *Sashimi* quality, while yellowfin tuna

has increased to US\$3.79/kg. The price of skipjack is still far below that of tuna. The small scale skipjack fisheries catch rarely meets the export quality, hence most of this production is turned over for the local market. The production of PT Perikani however, almost entirely achieve the export quality standard.

5.3 Fish Marketing Institutions

Fish marketing institutions in this context refer to the marketing route in local markets at which the fish are delivered from the producer to the consumer. This include the *TPI* grossiers, fish middlemen, and fish peddlers.

Fish marketing institutions, both of fresh and processed fishes are not yet well established. The formal institution is the *TPI* that was established and is managed by the government, while others are in the hand of individual fish middlemen and their sub-ordinates. The fish marketing institutions in North Sulawesi are illustrated in Table 7.

The bigger *TPI* in the producing area is in Bitung. The *TPI* seems to be a tool for collecting fees without any function because it is rare to find any bargaining among fish grossiers, especially in the landing place of the town.

Market institutions commonly delivering skipjack to the consumer other than the *TPI* are fish grossiers (*Bandar ikan*), small fish brokers, retailers, and fish peddlers. A relatively large fish middleman also functions as a money lender to fishermen. Fish grossiers operate in markets both of the producing and the consuming areas. Some people work in both markets, but many differs though they have kinship or friendly relationships. A land manager (*Pengurus*), who is appointed by the vessel owner, often serves as a grossier to his catch. *Bandar ikan* is a fish broker who can cover fish transactions up to 2,000 kg per day. They have no cold storage or other preservation equipment, so when their daily capacity is unsold they smoke the skipjack that is popular among consumers.

Table 7. Market area, market institution, and capacity of transaction

Market area	Market institution	Capacity/day
Producing area	Auction place (<i>TPI</i>)	10,000 kg
	Bitung Grossier	2,000 ♀
	Likupang Small fish broker	150 ♀
	Belang Retailer	50 ♀
	Inobonto Fish peddler	10 ♀
Consuming area	Auction place (<i>TPI</i>)	15,000 ♀
	Manado Grossier	2,000 ♀
	Tomohon Small fish broker	150 ♀
	Tondano Retailer	50 ♀
	Langowan Fish peddler	10 ♀
	Kotamobagu	

Small fish brokers are those who have capital to cover fish transactions up to 150 kg per day. They must pay in cash to the fish grossier except his sub-ordinates who can pay after the sale.

Fish retailers are common in fish markets of the town both in the producing and the con-

suming areas. Their capacity to pay is only up to 50 kg in a day.

Fish peddlers (*Bakul ikan*), usually housewives, are common in Manado City and they walk from door to door selling fish with baskets on their heads. They buy fish from the retailer in the central market in cash and then split the skipjack into several pieces. Most office workers prefer to buy fish from fish peddlers because they come to each home and will barter in rice, clothes or any other valuable material.

Little is known about their dealings on a daily loan basis. Six to ten fish peddlers go to a money lender to borrow money of Rp. 10,000—20,000 each to buy fish. Before noon, after selling the fish they pay the money lender the capital plus an interest of 10% in a half day. In this case, there is no relationship between fish broker and money lender.

Other institutions are the provincial trade office and quality control office for overseas sales of skipjack-tuna. To sell fish to the overseas market one is required to get permission from these institutions.

5.4 Marketing Channel

There are four routes for skipjack marketing in North Sulawesi as illustrated in Table 8. Route A is the shortest to the consumer; from grossier at the *TPI* in the producing area to the small fish broker. The consumer pays Rp.1,750/kg of which the fisherman receives Rp.875, *Pengurus* Rp.225, the grossier Rp.400, the small fish broker Rp.250. In route B fish passes at least five institutions so that the consumer has to pay a higher price. The *TPI* levies a 5% fee on both grossiers of the producing and the consuming areas. The same pattern occurs in route C and D. Thus, the longer the route the higher the price for the consumer but the producer receives the same amount, namely Rp.875/kg.

Table 8. Marketing route and price of skipjack unit: Rp./kg

Route	A	B	C	D
Producing area				
Producer	875	875	875	875
Grossier (<i>TPI</i>)	1,100	1,100	1,100	1,100
Consuming area				
Grossier (<i>TPI</i>)		1,500	1,500	1,500
Small fish broker	1,500	1,750	1,750	2,000
Retailer			2,250	2,250
Fish peddler				2,500
Consumer	1,750	2,000	2,500	2,750

5.5 Mechanism of Fish Transaction

Except for the export market, most fish transactions remain in a traditional basis which may appropriately be called as a black market. Each fishing vessel of 20-30 GT has its own land manager (*Pengurus*) who also serves in many cases as a grossier in the producing area. Therefore, the fish is transferred directly without an auction. Even if there are other competing grossiers on the process of auction, this *Pengurus* will compete until his rivals lose in the bargaining.

For this reason, it is difficult for other grossiers and small fish brokers to buy fish directly

at the *TPI*. *Pengurus* domination extends to the grossier in the consuming area who have to obey his command on the level of price. If a grossier in the consuming area refuses his request the *Pengurus* treats the *TPI* in the consuming area in the same manner as does at the *TPI* in the producing area where he returns the fish and then distributes it to the small fish broker/retailer. Hence the marketing margin that is usually procured by the grossier in the consuming area adds to his income. In other words, the transaction of skipjack in the local market is predominated by the fish grossier in the producing area. At the same time he also dominates the producer. It is difficult for the vessel owner to sell the catch outside his grossier due to a lack of marketing route.

6. Socio-economic Characteristics of Fishermen

6.1 Characteristics of Laborer

Each fishing vessel has a *Kongsi* which is a labor union on board. The captain becomes head of the *Kongsi* and the crew who work more than six months are eligible to be members of the *Kongsi*. It functions mainly to protect the interest of the crew, particularly on the level of wage and other incentives. The *Kongsi* votes on each proposal to the vessel owner. The final decision must be reached through discussion among the members which is called a *Mushawarah*. For example, if a new laborer proposes to work on board, the acceptance or refusal must be decided through the *Mushawarah*.

The crew include temporary laborers called *Kuli jarang* who work 2—3 days and then move on to other fishing vessels. Such laborer is not included in the *Kongsi* member and he receives a daily bonus only that is two times more than that of the *Kongsi* members.

The second characteristic refers to *Nelayan cari makan* that means fishermen who work for daily foodstuff. If they have enough income, they tend to stay at home until it is depleted. Thus, *Nelayan cari makan* and *Kuli jarang* are similar, but *Nelayan cari makan* work with their own small boat, while *Kuli jarang* work on board belonging to other people.

6.2 Remuneration System

The remuneration for work on board of skipjack fishery in North Sulawesi consists of fixed wage plus incentives and a yield share system. The former applies to PT Perikani and the latter to all private companies.

Wage plus incentives is adapted to both laborers on land and sea in PT Perikani. The land laborers receive fixed monthly salary, family incentive plus the structural incentive to the section manager, while the crew receive fixed monthly salary, a family incentive, a sea incentive, a premium, and fish for their own consumption. The amount of fixed wage and premium of crew is presented in Table 9.

Monthly family incentive varies from Rp.5,000 to Rp.15,000 according to family members. Almost the same amount they receive for a sea incentive; Rp.7,500—17,500 which is regarded as insurance paid directly to the crew instead of an insurance company.

The crew also receive a monthly premium according to the volume and quality of the

Table 9. Fixed wage and premium of crew of PT Perikani

Position	No. of men	Wage Rp./month	Premium/person	
			Point	Rp./month
Captain	1	80,000	9.5	17,299
Head of engine room	1	80,000	8.5	15,478
Assistant captain	1	18,000	7.0	12,747
Fishing master	1	22,000	7.5	13,657
Boat administrator	1	16,000	6.0	10,926
Bait thrower	1	18,000	7.0	12,747
Fisherman 1	6	15,000	4.0	7,284
Fisherman 2	3	10,000	3.0	5,463
Engine worker	1	18,000	5.0	9,105
Oilman	1	11,000	4.0	7,284
Cook	1	10,000	3.0	5,463
Total	21		90.5	164,800

Source: Interview data from PT Perikani Sulutteng, 1990

catch; Rp.250/kg for export quality, Rp.150 for local market quality and 10% of the catch at less than a ton and 20% at beyond a ton. Typically, when a 30 GT vessel with 21 laborers capture 4,120 kg of skipjack of which the composition would be as follows:

Export quality: $2,472 \text{ kg} \times 20\% \times \text{Rp.}250 = \text{Rp.}123,600$

Local market quality: $1,648 \text{ kg} \times 20\% \times \text{Rp.}125 = \text{Rp.}41,200$

The total premium of Rp.164,800 is distributed among the 21 laborers based on each share point to a total 90.5 points as shown in Table 9.

The crew also get a bonus in the form of fish for home consumption. When the catch per trip is less than 200 tails there is no premium. Beyond 200 tails it is distributed equally to each crew. With a catch of 201—400 tails, each crew gets a tail, so 21 tails should be deducted from the catch for 21 crew. The same pattern occurs for each additional 200 tails. At present however, the enterprise prefers to pay in cash because the fish price increases according to the following rate: at the range of catch 1—11 tons they get 10% of the total value; 11—16 tons, 15%; 16—21 tons, 20%; 21—25 tons, 25%; and more than 26 tons they receive 30%. The way of calculation is the same as in the previous method.

6.3 Yield Share System

Despite differences in rates of share, all private companies use the yield share system. The first share is divided among three groups, namely of the total catch per trip 60% for the vessel owner, 20% for the bait fishery, and 20% for the crew. The labor's share is subdivided according to the points of each crew. In the case of PT Mina Pelita, 20% amounts to Rp.113,460 and the total share points are 443 for the 14 crew of a 20 GT vessel, the distribution among the crew is shown in Table 10. As observation on several private companies they differ merely in the number of share points, but are calculated in a similar way.

The crew also get a premium in the form of fresh fish for home consumption based on the level of the catch. At 300—700 tails each crew gets 2 tails, 701—1,000 tails, 3 tails; 1,001—1,700 tails, 4 tails; and beyond 2,000 tails, 5 tails. They are free to sell either outside or to their com-

pany or to bring back home for consumption. This distribution is performed by the head of the *Kongsi*, the captain under the control of the vessel owner.

Table 10. Distribution of the yield share among the crew

Position	Share point		Yield share (Rp.)	
	Pelita	Wahyu	Pelita	Wahyu
Captain	16	12	4,096	5,952
Copilot 1	15	11	3,840	5,456
Copilot 2	13	9	3,328	4,464
Head of engine room	16	12	4,096	5,952
Engine room worker	15	11	3,840	5,456
Boat administrator	12	8	3,072	3,968
Bait thrower	15	11	3,840	5,456
Assistant bait thrower	14	10	3,584	4,960
Oilman	11	8	2,816	3,968
Fisherman 1	11	8	2,816	3,968
Fisherman 2	10	7	2,560	3,472
Cook	10	6	2,560	2,976
Manager (on board)	10	10	2,560	4,960
General manager (land)	10		2,560	

Source: Interview data from PT Mina Pelita and Wahyu, 1990

Exact data on the level of total wage of each crew is unclear, but from the above figures it is estimated to be from Rp. 60,000 to Rp. 200,000 per month in PT Perikani and ranged of Rp. 60,000—150,000 in private companies.

The laborers are quite mobile at any time since there is no legal contract with the vessel owner, but as soon as one laborer takes a rest, another replaces him. This behavior is the main problem for the vessel owner, therefore PT Perikani applies a fixed wage system to keep laborers more consistent.

6.4 Social Status of Fishermen

In North Sulawesi there are four main ethnic groups which are totally different in languages, cultures, social attitudes, and way of life. Each ethnic group has their own work preference. The Sangihe group prefers to work at sea more than the other three ethnic groups. Table 11 indicates the number of crew by ethnic group in several fishing vessels. 70% are the Sangihe group whose home land are in the northern islands of Sulawesi Island. They work as fishermen since their land is too small for agriculture. The Sangihe group is well known in North Sulawesi and even in Indonesia as seamen. They are the majority in most fishing boats and also inhabit many coastal villages.

The Minahasa group prefers office work to fishing. They only work on board with bases in their region. Few of Gorontalo or Mangondow are found working in the skipjack fishery in Bitung.

The age composition of the skipjack fisheries crew indicates that 76% are less than 39 years old, 13% are 40—50 years old and the remaining 11% are beyond 50 years old. This composition is quite constant even though individual laborer is very fluid. Very few of them

Table 11. Ethnic composition of laborers of skipjack fishery

Ethnic group	Boat			%
	30GT	40GT	Total	
Sangihe	118	60	178	70.4
Minahasa	45	22	67	18.6
Gorontalo	4	4	8	3.1
Mangondow	2	4	6	2.4
Others	4	10	14	5.5
Total	153	100	253	100.0

Source: Internal materials of PT Perikani Sulutteng, 1990

work for 10 years in the same fishing vessel or company. Otherwise less than five years is the most common.

About 60% of the laborer finished elementary school, 21% junior high school, 8% senior high school, 2% graduated from senior fisheries high school, and the remaining 9% had no educational background. A vocational school for fisheries was established in the 1960's in Bitung which has about 50 students every year, but few of them work on board of skipjack boats or any other fisheries, as would be expected of graduates of higher level.

In North Sulawesi social rank is primarily based on the level of education, followed by official position, and by material possessions. The higher educated people obtain a higher social status regardless of official position and material possessions.

7. Conclusion

The first socio-economic characteristics of the skipjack fishery in North Sulawesi is the development with a slow growth rate in terms of gear and technology, production, marketing system, and level of income for laborers. In reference to gear and technology, there is a tendency to return to the traditional methods. This reflects the development of the regional economy as a whole, of science, and of technology. Previously, PT Perikani tried to use modern fishing vessels imported from Japan, but found difficult to maintain and handle them. After that, they decided to revive semi-traditional technology such as *Serbaguna* and *Funae* as an alternative to the common pole and line fishing method.

The slow economic growth of the skipjack fishery in this region is also observed in its history. It was introduced in the 1920's, but still remains small scale in nature and dominated by traditions up to present.

The skipjack fishery is dominated by household management. Although there exists few vessels of enterprise management, they still use semi-traditional gear and technology. Hence they are more oriented to artisanal rather than to the modern fishing industry. This orientation reflects a management pattern in which conventional management evolved into a nucleus company, i.e. one enterprise integrates several hundred traditional fishermen. Thus, the structure of the skipjack fishery is characterized by the merging of industrial and traditional fisheries.

Skipjack as well as tuna is unexploited fully in North Sulawesi. The annual production has

been less than 10,000 tons for the last ten years which is equivalent to just 30% of the MSY.

The marketing system of skipjack is dominated by tradition in which a fish grossier in the producing area controls the fish marketing from the producer to the consumer. Bargaining of price seems to occur only in the *TPI* in the consuming area, however the price competition is controlled solely by the fish grossier.

The skipjack fisheries laborers are traditional fishermen who work for daily needs. When they get enough income to sustain several days of consumption, they will stay at home until the stock of food is depleted. Most laborers are derived from the Sangihe ethnic group who are well known as seamen. Labor's share of the fishery is still relatively low compared to that of the vessel owner and as a consequence their income still remains low.

Reference

Anonymous 1990. Provincial Fisheries Statistics Year Book (in Indonesian). 85 pp., Government of North Sulawesi, Manado.

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