

INCOME SHARING SYSTEMS AMONG PURSE SEINE FISHERMEN IN CAM RANH AND NHA TRANG, VIET NAM

Kim Anh Thi Nguyen, Thanh Thuy Thi Pham and Prof. Ola Flaaten

This paper presents initial information on the income status of purse seine fishermen in Nha Trang and Cam Ranh, Viet Nam. Based on these initial findings, an analysis of the factors influencing the fishermen's income from purse seining will be done soon. Hopefully, the results of this study will help planners as well as policy makers in acquiring more practical solutions on how to increase the income of small-scale fishermen.

It can be said that, the coastal zone has provided the fishing grounds and income sources for generations of poor fishermen who live along the coasts and earn their livelihood through traditional fishing practices, namely: trawling, purse seining, lift netting and others. In Vietnam, small-scale fishing operations contribute 86% of the total production generated by the nation's marine fisheries (Nam, 2005). Fish represents a source of local nutrition as well as the main, if not the sole, income generator in fishing communities.

Khanh Hoa is a coastal province in south central Vietnam bordered by Phu Yen Province on the north, Dak Lak and Lam Dong Provinces on the west and Ninh Thuan Province on the south. Khanh Hoa also includes well known bays such as Cam Ranh, Van Phong and Nha Trang. It is among the provinces in south central Vietnam that utilizes and develops various fishing methodologies, e.g. long lining, gill netting, purse seining, trawling, however, small-scale fishing is still prevalent. With an aim of assessing the living conditions of the province's fishing communities, this study hopes to provide valuable information on the income status of fishermen using purse seining techniques along the coast of Cam Ranh and Nha Trang.

Introduction

Purse seining was first introduced in northern Vietnam in 1959 and later in the south. Its development however, started only in 1975. Purse seining comprises two widely used fishing methods, namely: luring light and searching methods. The luring light method is very popular throughout the whole country. The purse seine in this method is usually about 250-500 m in length and about 45-70 m in depth (Long *et al*, 2002). Since the fish schools often concentrate around fish shelters and under light sources, large size nets are not

necessary, but the nets should be big enough to surround the schools of fish.

On the other hand, since pelagic fishes move at high speed, purse seiners using the searching method must also move fast especially in setting the nets. Thus, the purse seine must be both long and deep, usually 500-1200 m long and 70-120 m deep (Long *et al*, 2002).

In Khanh Hoa Province, purse seining operations cover the Cam Ranh district and in some wards of Nha Trang. Majority of the fishing boats using the luring light method are small and operate in the coastal areas 10-15 miles from the shore. Its geographical features however, make the Khanh Hoa waters not very attractive to the purse seiners using the luring light method like in other provinces. In Cam Ranh, purse seining is classified into pelagic purse seining and anchovy purse seining. The average capacity of the purse seiners is 44 HP with an average length of 14.03 m, and chiefly operating the luring light method. Whereas in Nha Trang, anchovy purse seining is widely used with the purse seiners having an average capacity and length of 66 HP and 13.79 m, respectively, and conventionally using the searching method.

With regards to anchovy purse seining, the target species are the seasonally migrating fishes in schools, namely: anchovy, mackerel, skipjack tuna, scad, etc. Among these, anchovy makes up a large proportion in the total catch. The average duration of their operations is 8.15 months/year with high season from January until August or September with the remaining months regarded as low season. The average mesh size of the anchovy purse seine is relatively small (approx. 0.2 cm), making it incapable to operate in waters with strong pressure such as in offshore



Anchovy purse seiner in Nha Trang

fishing grounds. For this reason, the popular fishing ground for Nha Trang purse seiners is around Nha Trang Bay, and similarly in Cam Ranh, in the vicinity of Cam Ranh Bay. Since schools of fish are sometimes unpredictable in Cam Ranh Bay, some anchovy purse seiners often sail towards the waters of nearby Ninh Thuan Province for their fishing operations.

For pelagic purse seining, the target species are the schools of pelagic fishes migrating seasonally, such as scads, mackerel, skipjack tuna, etc. The average duration of their operations is 6.83 months/year from January until June or July. In February or March, pelagic purse seiners move to

the waters of Ninh Thuan Province to catch mackerel. While before fishing vessels often leave ports at 4 or 5 PM and return early the next morning, today, with the expansion of the fishing grounds from Khanh Hoa to Ninh Thuan, some fishermen prolong their typical trips to 3-5 days, increasing the days-at-sea by 1 to 3 days. The average mesh size of the pelagic purse seines varies between 0.8 and 1.2 cm, relatively larger than that of anchovy purse seines. Subsequently, if well equipped, some fishing vessels move to fish in the offshore waters.

In general, there are minor variations in terms of hull lengths and engine capacities in Cam Ranh, where its pelagic purse seiners have average length and capacity higher than that of the anchovy purse seiners (**Table 1**). In contrast, the engine capacity varies significantly in Nha Trang, where its purse seiners have generally higher power than those in Cam Ranh, but the mean length is not much greater. The incompatibility between engine capacity and vessel length, caused by installing high capacity engine in small vessels, could cause imminent danger to the fishers' safety.

In terms of capital investment, small-scale fishing operations receive little or no support from the government unlike in offshore fisheries which have been encouraged for further development. Small-scale fishermen from in Cam Ranh and Nha Trang mostly self-finance the procurement of their vessels. In contrast to large scale fisheries, there is no partnership between small-scale fishermen and financiers to raise the investment capital for acquiring fishing vessels.

Table 1. Some technical characteristics of the purse seiners in Cam Ranh and Nha Trang

Items	Cam Ranh								Nha Trang			
	Pelagic purse seiners				Anchovy purse seiners				Anchovy purse seiners			
	Max	Mean	Min	SD	Max	Mean	Min	SD	Max	Mean	Min	SD
Hull length (m)	16.00	14.28	9.10	1.62	15.00	13.81	12.00	0.83	15.00	13.76	10.60	1.24
Engine power (HP)	80	47	20	19	80	42	20	14	240	66	22	51
Crew size (person)	14	11	5	2	15	12	10	2	15	13	8	2

Table 2. Typical investment structure per purse seiner in Cam Ranh and Nha Trang (Unit: VND 1,000; USD 1.00 = VND 15,900)

Items	Cam Ranh				Nha Trang	
	Pelagic purse seiners		Anchovy purse seiners		Anchovy purse seiners	
	Mean	%	Mean	%	Mean	%
Hull	149,692.89	39.55	127,937.17	45.98	164,013.62	45.00
Engine	65,441.75	17.29	33,804.64	12.15	64,599.55	17.73
Mechanical equipment	18,877.78	4.99	18,678.95	6.71	10,280.92	2.82
Electronic equipment	14,427.78	3.81	13,100.00	4.71	4,702.89	1.29
Fishing gear	124,595.60	32.92	79,485.24	28.57	115,870.13	31.79
Light system	5,435.56	1.44	5,254.00	1.89	4,974.21	1.36
Total	378,471.36	100.00	278,260.00	100.00	364,441.32	100.00

A small number of fishing households avail of loans from the private sector as they are not eligible for loans from banks since investment in small-scale fisheries is considered a high risk venture requiring also large collaterals other than their own fishing vessels.

The purse seiners generally have large engine capacities and large nets in order that schools of fish could be encircled successfully. The number of fishers on board is around 8 to 15 providing enough manpower for each haul. Members of the crew are usually relatives of the vessel owner while only a small number may be hired. Hired labor may be thought of as working only for the money, but this misconception is not true in the fishermen's communities. Vessel owners and the crew consider themselves as partners bearing the difficulties and sharing the benefits together. Thus, the income sharing pattern between the vessel owners and the crew is more or less determined by this mindset.

Research method

The data were collected in 2005 from purse seine fishermen in Cam Ranh and Nha Trang. Direct interviews with the skippers, fishermen and vessel owners were conducted to gather information on the fishing grounds, fishing time, production, vessel characteristics, fishing gears, income, expenses and the income sharing pattern used. Information on taxes and registration fees were collected from the local authorities. In addition, visit to gear and equipment retailers were also conducted to confirm the accuracy of information provided by the fishermen.

Stratified sampling was employed to select the target respondents, and face-to-face interviews were conducted based on standardized questionnaires. In Cam Ranh, thirty eight samples for pelagic purse seining and 20 for anchovy purse seining, representing 30.4% of the vessel population, were chosen. In Nha Trang, 19 samples equivalent to 24.17% of the total vessel population, were taken from Vinh

Table 3. Number of purse seiner samples in Cam Ranh and Nha Trang

Localities	Number of vessels	Number of samples	%
1. Cam Ranh	125	38	30.4
- Binh Ba -Binh Hung island	47	12	25.5
- Mainland Cam Ranh	78	26	33.3
2. Nha Trang	79	19	24.1
- Vinh Truong and Vinh Nguyen	43	11	25.6
- Vung Ngan island	36	8	22.2

Nguyen and Vinh Truong wards and Vung Ngan island where anchovy purse seining is developing at a fast pace.

Since pelagic purse seining is not progressing well in Nha Trang, this was not investigated during the course of this study and thus, is not included in this paper. Moreover, existing regulations exempt vessels under 20 HP from registering at the Fisheries Resource Protection Department, therefore, it is not possible to obtain exact information on addresses of the vessel owners. As a result, this report focuses only on the vessels with 20 HP capacities and above.

Results and discussion

Income sharing system of the purse seine fishery in Cam Ranh

For the purse seine fishery in Cam Ranh, at the end of the month and after the operating costs are deducted from the revenue, the remaining income is shared between crew and the vessel owner. Income sharing, which is subject to mutual agreement, can follow the 5:5 or 6:4 ratio for owner and crew, respectively. If the sharing system follows the 5:5 sharing ratio, the operating costs that include variable costs, maintenance costs, taxes, fees, and insurances, are deducted from the gross income before the sharing takes place. Maintenance costs cover expenses for hull, engine, and fishing gear.

If the sharing system follows the 6:4 sharing ratio, the operating costs that include variable costs, maintenance costs, taxes, fees, and insurances are deducted but in this case the maintenance cost is applied only for the fishing gear. Then the vessel owners calculate the individual shares based on a preset point system in accordance with an individual's job duties and responsibilities, i.e, the skipper gets 1.5 points, chief mechanic 1.1 points and fishers get 1.0 point each.

However, there may be instances when vessel owners assign a higher point to the chief mechanic, while some skippers, who are also the vessel owners would receive 1.0 point instead of 1.5 as is the common practice. The vessel owners use this scheme as incentives for the crew. Thus, by increasing their earnings and improving their conditions, the boat owners hope to gain the crew's support and loyalty. The general income sharing pattern on a monthly basis, adopted for purse seine fishermen in Cam Ranh is shown in **Figure 1**.

Generally, the income of fishermen consists of the monthly output-dependent income as well as income derive from a

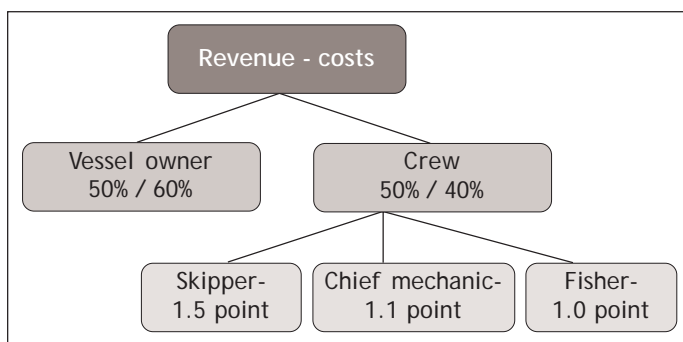


Figure 1. Income sharing pattern for purse seine fishermen in Cam Ranh

number of other related activities, such as amount for daily living expense support and on-board meal support. The composition of the total income of the purse seine fishermen in Cam Ranh is shown in **Figure 2**.

However, the above method of operational organization and income sharing in the fishing communities of mainland Cam Ranh have somewhat changed, except at the Binh Ba - Binh Hung island, where the sharing pattern has not changed for years, particularly the practice of “contributing individual food for collective meals”. In these island communities, every afternoon, the fishermen gather before boarding the boats heading towards the sea. Every fisherman bring his own supply and prepared food, since the vessel owners provide only the essential cooking materials and equipments such as gas, cooking oil, fish sauces, etc.

There are no onboard meal benefits given by the vessel owners. Instead, the members receive their share from the daily income of selling their produce and the amount of fresh fish they receive as supplement for their family’s meals. The vessel owners do not normally set a fixed quantity of fish to be taken by the fishers because they are very sensible enough to take only a reasonable amount. As a result, the income sharing practiced in Binh Ba island is different from that in the mainland Cam Ranh (**Figure 3**).

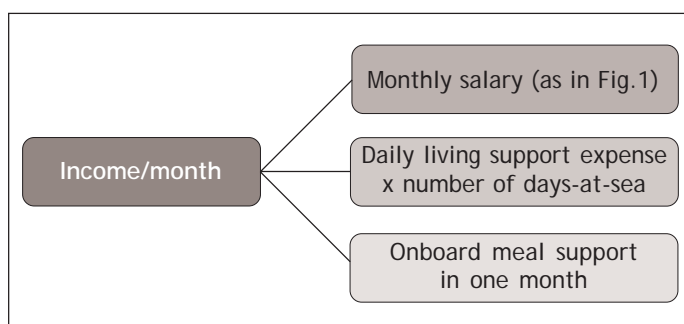


Figure 2. Composition of the total income of purse seine fishermen in Cam Ranh

Income sharing system of the purse seine fishery in Nha Trang

In anchovy purse seining, income sharing practices among vessel owners and crew in Nha Trang are to some degree different from those in Cam Ranh. In Vinh Truong and some fishing communities in the mainland of Vinh Nguyen, boat owners often rent daily laborers at VND 30,000 to 40,000/day/person. After each fishing trip, each member equally gets 10% of the total sales. When asked why the conventional sharing practice like those in Cam Ranh was discontinued, many fishers considered as among the reasons the increasing difficulty in the fishing operation therefore, secure daily earnings can help their family’s monthly expenses. Some crew members also doubt some boat owners’ honesty in regard to sales reporting and recording. The composition of the monthly income of purse seine fishermen in Vinh Truong and Vinh Nguyen is shown in **Figure 4**.

In Vung Ngan island of Vinh Nguyen ward, the income sharing pattern among fishermen is similar to that of Cam Ranh. Since the crew members come from other provinces, they live with the vessel owners’ families. At the end of the month and on holidays, they are allowed to visit their families and the sharing of income is usually done at this time. After deducting all the expenses (variable expenses, taxes, insurances, gear repairing costs), the owner and the crew get 6 and 4 parts, respectively. In addition, after each trip, each fisher is eligible for daily living expense support based on the net hauling time, which is usually VND 10,000 for one net hauling time (**Figure 5**).

Differences in the income sharing patterns by purse seine fishermen in Cam Ranh and Nha Trang

It should be noted that the average incomes in this research comprise those that are statistically identifiable and collectible. In practice, especially the pelagic purse seining,

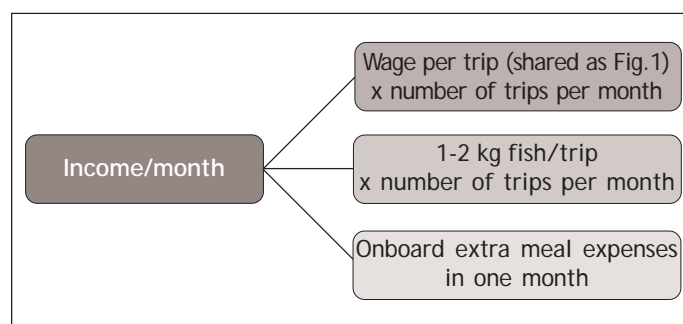


Figure 3. Income sharing for purse seine fishermen in Binh Ba island (Cam Ranh)

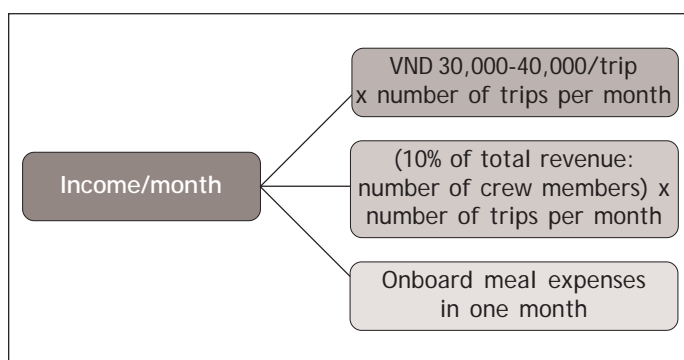


Figure 4. Composition of the income of purse seine fishermen in Vinh Truong and Vinh Nguyen (Nha Trang)

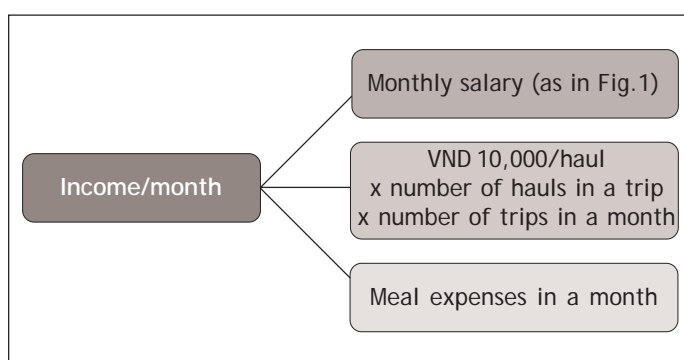


Figure 5. Composition of the income of purse seine fishermen in Vung Ngan island (Vinh Nguyen, Nha Trang)

fishers have other prominent income sources coming from individual fishing during the waiting time between two consecutive hauls. A productive fisherman can earn more from VND 70,000 to 100,000 a day. However, since this additional earning is not stable and depends on the individual's effort, it is not included as a source of income in the report (Table 4) because this is largely on case-to-case basis.

The income data revealed that under the four income sharing patterns, the fishermen's individual earnings are higher than the average per capita in Khanh Hoa (in 2005 it was USD

730/year, equivalent to VND 967,250/month (Report, 2005)). With such attractive earnings, a question on why coastal fishermen continue to live in such poor conditions remains unexplained. There could be several reasons for this. Firstly, fishing is almost the sole livelihood providing income to the majority of people living along the coast. Although some households have been successful in seeking alternative livelihood to secure their income, such as from aquaculture (lobster culture), handicraft making and others, the number of such households is relatively small.

Secondly, the birth rate in fishing villages still remains high with each family having four (4) children on the average. In a family with maximum of six (6) members, the average income per person ranges from VND 250,000 to 300,000/month. For Vietnam the poverty limit is on an income of VND 200,000/person/month in rural areas and VND 260,000/person/month in urban zones (Decision, 2005). Based on such poverty limit, the fishermen in Cam Ranh enjoy a small margin above the poverty standard while in Nha Trang the fishers' incomes fall below the poverty line.

Looking at the social perspective, the high birth rate stems from the preference for boys in the fishing villages. The local people believe that only men are capable of doing fishing activities and that families having more male children will surely attain a secure financial status. Thus, for families that earn their living through fishing, having no male children as the main labor provider of the family, is an ultimate disaster. For the local people, women can only do house work, bringing up children and selling fish after the vessels return from the sea.

It is such village perception that places many households in unfortunate situations where one person works to care for many dependents. Men try their utmost effort to support the whole family. A high birth rate consequently becomes one of the main factors that lead to the rampant overexploitation, presenting inherent obstacles in improving the living conditions of the fishermen.

Table 4. Average monthly income of purse seine fishermen in Cam Ranh and Nha Trang (Unit: VND 1,000; USD 1.00 = VND 15,900)

Items	Sharing pattern on ratio basis			Sharing pattern on daily fixed basis
	Binh Ba island - Cam Ranh	Mainland - Cam Ranh	Vung Ngan island - Nha Trang	Mainland - Nha Trang
1. Salary	1,627.27	1,248.08	1,131.25	940.00
2. Living expense support, earnings converted from quantity of fish	200.00	300.77	485.00	361.82
3. Meal expense support	109.57	254.72	295.55	224.48
Total income ((1)+(2)+(3))	1,936.84	1,803.57	1,911.80	1,526.30



Fishermen carry their catch in trays from fishing boat to the fish landing port



On the other hand, if the sharing method used in Cam Ranh is applied to calculate the average monthly revenue of purse seine fishermen in Nha Trang, the results obtained could be different as shown in **Table 5**.

With fixed daily wages, the fishermen earn the highest average income/month (**Table 5**). Thus, the fixed daily wage offers the greatest benefit to the crew members of the purse seiners in Nha Trang. This proves that in the sharing pattern, the vessel owners do not set the rules against the will of their crew. From direct conversations with vessel owners, it was revealed that they have been waiving their rights for the wages of the fishers as was always done in the past, for the main reason that low wages can be a problem in looking and hiring enough laborers for a fishing trip.

Factors that influence the income levels of purse seine fishermen in Cam Ranh and Nha Trang

Results from the interviews with purse seine fishermen in Cam Ranh and Nha Trang revealed many factors that could have influence on their incomes, the most dominant include:

Table 5. Average monthly income of purse seine fishermen in Nha Trang using the sharing pattern practiced in Cam Ranh
(Unit: VND 1,000; USD 1.00 = VND 15,900)

Items	The sharing pattern used		
	6/4	5/5	Fixed salary
Average income/month	692.71	865.99	940.00
Living expenses support	356.29	356.29	361.82
Meal expense support	224.48	224.48	224.48
Total income	1,273.48	1,446.76	1,526.30

Knowledge and experiences of the skippers to locate abundant fishing grounds

For a successful and productive haul, the skippers need to assess the wind and water directions as well as the strong, weak and still times of the water current to determine the exact net-setting time. The skippers must have good knowledge of fishing seasons, migrating and schooling habits of different fish species, etc. They should also understand the basic characteristics of fishes. For example, when fish is confronted with obstacles they tend to make a U-turn or swim to the bottom, and knowledge on such behavior determines the productivity of the fishing trip. A thorough understanding of the fishing grounds is also among the important factors determining the success of the hauls. In practice, the skippers' predictions are often supplemented with data recording on geographical coordinates, date, time and weather conditions of their previous successful hauls. In addition, they also get information from other fishing vessels to predict and search for the precise abundant fishing grounds.

The survey also demonstrated that majority of the fishermen's families have long fishing traditions that have been passed on for many generations. The households having long history of fishing accounted for 90% of the total samples. Although most young fishermen do not attend academic marine training courses, they have mastered the trade by working with the senior fishermen. Through practice they acquire fishing skills as well as technical, mechanical, and navigation skills on the job. This explains the fact that even if many fishermen have not attended schools formally, they are very accomplished and are experts in fishing as well as marine navigational skills. They can also do some technical demanding jobs like construction and repair of fishing vessels.

Technical properties of fishing gears

The nets should also meet the standards, such as appropriate height, sinking speed (lead fishing weights), and the direction for reversed capacity in order to produce high yield.

Distance of the fishing grounds

The data in Table 4 above illustrate that the average income of fishermen on the islands are higher than those from the mainland mainly due to lower fuel costs for traveling from the islands to the fishing grounds. Lower fuel costs naturally lead to higher income for the fishermen on the islands.

Figure 6 shows that the fuel expense for traveling from Binh Ba island to the fishing grounds is the lowest because of the proximity of the island to the fishing ground. Moreover, the fishermen do not use ice to preserve the fish as their catch is sold on-the-spot to boats coming to the island to immediately purchase their produce or shipped to the mainland for sale within the same day.

According to fishermen in Cam Ranh and Nha Trang, their expenses per trip in 2005 increased significantly as compared to those in the past several years. One of reasons is the fuel hike, which occurred three (3) times in late 2005 from VND 4,500 to 7,560/liter an increase of about 67% compared to the fuel price in early 2005 (Report, 2006). With increased costs of labor, fishing gears, provisions and other necessary supplies for a fishing trip, and increased in fuel price, it is surprising to note that fish prices have either not increased or increased only at a very small margin.

Conclusions

The fishermen's income mentioned in this study is the main and almost the sole income source from purse seine fishing in Cam Ranh and Nha Trang. In fact, the number of households with secondary jobs other than fishing is quite small. According to the research findings, in Cam Ranh, there are only 6 out of 38 households having alternative livelihood such as the culture of lobsters or catching shrimps using luring light. In Nha Trang the percent of households without alternative livelihood is close to 100%. This explains why even if the income of the fishermen is relatively higher than the average income per capita in Khanh Hoa Province, their living conditions are still below the poverty standard. An analysis of the factors influencing the fishermen's income from purse seining will be done in another study. Meanwhile, it is hoped that the results of this study will provide information that could help the country's planners as well as policy makers in providing practical solutions on

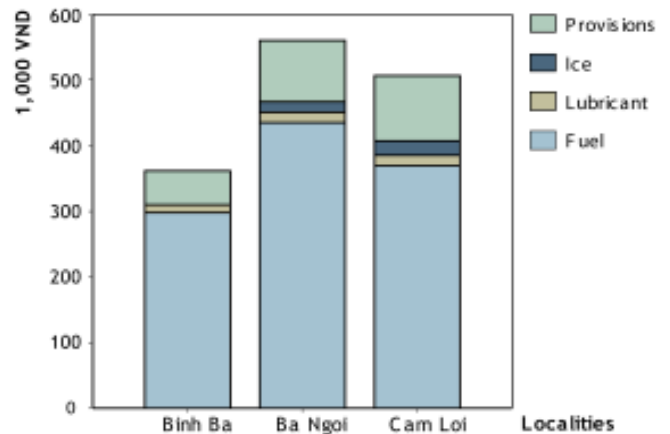


Figure 6. Average variable costs per day of anchovy purse seining at some wards in Cam Ranh (Capacity group under 45 HP)

how to improve the living conditions of the purse seine fishermen.

References

- Decision. 2005. Decision No 170/2005/Qñ -TTg of July 8th, 2005 Promulgate *Poverty Standard applied for the period 2006-2010* of The Prime Minister. Hanoi, Vietnam. Available from: http://vbqpppl.moj.gov.vn/law/vi/2001_to_2010/2005/200507/200507080002
- GSO. 2005. *Khanh Hoa's Statistic Yearbook*. Khanh Hoa, Viet Nam: General Statistics Office.
- Long, N., N. V. Khang, V. D. Hai and B. Chokesanguan. *Fishing Gear and Methods in Southeast Asia: IV*. Vietnam. Printed by Cooperation between SEAFDEC and RIMEF.
- Nam, V. N. 2005. *Fisheries Import & Export Market*. Statistic Publishing House.
- Report. 2005. *The Year-End Summation about Economics and Society Situation*. At the meeting from 24-26/12/2005: Khanh Hoa Party Steering Committee.
- Report. 2006. *The Summary Report in Situation of Effectuate the Plan in 2005 and Direction to Develop Economic-Society in 2006 of Fisheries Industry*: Fisheries Ministry.

About The Authors

Dr. Kim Anh Thi Nguyen and Thanh Thuy Thi Pham are Lecturers of the Faculty of Economics, Nha Trang University, 2 Nguyen Dinh Chieu Street, Nha Trang City, Khanh Hoa Province, Vietnam.

Prof. Ola Flaaten is from the Department of Economics and Management, Norwegian College of Fishery Science, University of Tromso, N-9037 Tromso, Norway.