

# COSTS AND EARNINGS FROM OFFSHORE TUNA LONG-LINE FISHERY IN NHA TRANG, VIETNAM

*Kim Anh Thi Nguyen, Tam Ngoc Dang Thi, Prof. Ola Flaaten, Dung Thi Phan, and Tram Anh Thi Nguyen*



Khanh Hoa Province is located along the coastal zone in south central Vietnam, covering a sizeable area of approximately 5258 km<sup>2</sup> with a coastline of 520 km. Its borders are Phu Yen Province on the north, Dak Lak and Lam Dong Provinces on the west, and Ninh Thuan Province on the south. Its capital city is Nha Trang and comprises six districts: Van Ninh, Ninh Hoa, Dien Khanh, Khanh Vinh, Khanh Son, and Truong Sa. The province also includes more than 200 islands offshore of which more than one hundred islands of various sizes are in Truong Sa District. With adjoining open oceans and international marine routes, Khanh Hoa's offshore area is one of the deepest in Vietnam. The province also includes well-known bays, such as, Cam Ranh, Van Phong and Nha Trang.

Khanh Hoa has therefore, the natural advantages for marine fisheries development, especially that it has been authorized to manage and exploit a very important fishing area in Truong Sa District, supplementing efforts for the intensification of the province's offshore fishing operations. An equally important factor that contributes to the successful fishing operations of Khanh Hoa is the attitude of its fishers. They are hard working and are attached culturally to their fishing

activities. They have good learning spirits with their minds open to improving their skills especially in applying advanced technologies for sustainable production.

Due to these favorable conditions, Khanh Hoa fisheries have gained considerable and continued to generate achievements, so that by the end of 2005, about 5424 vessels were registered with the total capacity of 216,775 HP, 369 of which have capacities of over 90 HP and are qualified for offshore fishing operations. In 2005, the total fisheries production of the province was about 88,740 mt, comprising marine harvest of 66,190 mt and from inland aquaculture and fishing about 22,550 mt. The fisheries export during the same year reached USD230 million.

In Khanh Hoa, long-line is now the most important gear used in offshore fisheries, while in the past, long-line was employed for both inshore and offshore operations. In 1995, offshore tuna long-lining was introduced by a private company, Truc An Co., Ltd. Since positive results were reported in 1996 by the hired experimental fishing vessels of Truc An, the fishers from those vessels shared their experiences with the other fishers from the province.

Coupled with some experiences provided by fishers from nearby Phu Yen Province, Khanh Hoa fishers upgraded their vessels and purchased fishing gears in order to take part in tuna long-lining operations. Since then, long-line has been playing an increasingly important role in Khanh Hoa's offshore fisheries. Hence, in the past few years, the operations of offshore tuna long-liners have brought about initial improvements in the living standards of fishing households and contributing to increased fishery exports. Obviously, tuna long-lining operations have contributed to the sustainable development of offshore fisheries in Khanh Hoa Province.

This study was therefore, conducted in order to establish an economic database that would support fisheries development policies for Nha Trang, the capital city of Khanh Hoa Province. The study described the important economic performance indicators for tuna long-line fishing operations that include investments, revenues, costs, earnings and returns on equity ratio (ROE). Further analysis on the factors affecting their performance must be a good topic for another study in the future. The study considered only 31 offshore tuna long-liners in three wards/communes in Nha Trang, such as, Vinh Phuoc, Xuong Huan and Phuoc Dong. The economic indicators used in the study are defined in the Box below.

**Revenues:** Considered as gross annual vessel revenue, this is the total year's vessel revenue at landed price, comprising all profits during the main and sub-seasons but excludes extra income that the vessel crew collect individually during the fishing trips

**Costs or Total Costs:** Consist of fixed costs (depreciation, payments for major repairs, loan interests, insurance, taxes) and variable costs (payments for fuel, preservation and storage (ice), provisions (food, soft drink, etc.), labor, minor repairs, and others that are included in each fishing trip)

**Earnings:** The difference between revenues and costs

**Return on equity ratio (ROE):** Measure of return on the owner's equity calculated by expressing the net earnings as a percentage of the owner's equity

## The Offshore Tuna Long-line Fishery in Nha Trang

There are more than 300 vessels in the offshore tuna long-line fishery in Khanh Hoa, mostly concentrating in several wards/communes in Nha Trang such as in Vinh Tho, Vinh Phuoc, Xuong Huan, Hon Ro, and Phuoc Dong. Many vessel owners have organized themselves into groups that

operate in the same fishing grounds, mutually cooperating in the harvesting activities, and sharing information about market prices as well as other information for the benefit of the members of the groups necessary in case of unexpected incidents.

The fishing season in Nha Trang Bay area falls during the lunar period between January and August and the fishing grounds geographically vary depending on the season and time of the year. During the early part of the year, the long-liners operate mainly in the fishing areas close to Hoang Sa Island (12° 00' - 17° 00' N and 111° 00' - 117° 00' E), but they gradually move to the South in the following months. In July and August, long-liners operate at Tu Chinh fishing grounds and in the South-West of Truong Sa (6° 00' - 11° 00' N and 110° 00' - 115° 00' E). During the last three years, the fishers generally got hefty harvests in the so-called "North" season (from January to May in the lunar cycle), while in the "South" season (from June to August in the lunar cycle), their production has been relatively low.

Basically, the fishing vessels have wooden hull with traditional designs native to central Vietnam. The engine capacities vary from 45 to 400 HP. Since the target fishing grounds are offshore and long fishing trips-at-sea are required, most if not all of the long-liners are equipped with sonar, and short-range radio for easy contact among the vessels. Furthermore, long-distance communication systems have also been acquired for contact from the vessels in the fishing grounds to their home bases so that information regarding prices, weather, and unexpected incidents can be timely transmitted.

As for the technical aspects, the offshore tuna long-line vessels from Nha Trang are equipped with winch, light, compass, navigator, short distant communication equipment, etc. The fishing gear consists of the main line, branch line, hook and net. The number of hooks per vessel varies with the vessel size, from 800 to 1600 hooks, equivalent to the length of the main line which is from 40 to 60 km. Long-liners often use as baits flying fish, scad and squid that they caught by themselves or sometimes purchased from other fishers. Each fishing trip of long-liners often lasts from 8 to 12 days, with the maximum of 2 hauls per day, and 3-5 hours for each haul.

Yellowfin tuna is the main species caught followed by the big-eyed tuna. As observed, the offshore tuna is relatively abundant during the period from February to June. On the average, one vessel can harvest 700 kg per fishing trip during this period. The annual overall tuna production of Khanh Hoa ranges from 1500 to 2000 mt.



Line-hooks

Winch



*Tuna long-liners in Nha Trang equipped with necessary navigational and communications equipment, preparing for their fishing operations. At right, the design of the wooden hull, which is typical to vessels from the central part of Vietnam*

With respect to semi-processing and storage, the fish is roughly handled upon its loading on board. Fishers use heavy tools (short sticks, pestles, etc.), hitting hard on the fish's head or drive pointed nails through its brain to kill the fish. Then, they use sharp knives to make a slit in the abdomen for gutting and cleaning the blood, removing the gills, and in taking out the mucous membrane and other internal organs. They also take advantage of the marine water to clean the fish, putting ground ice in place of the removed organs. Some fishers put the fish into barrels filled with marine water to lower the fish's temperature rapidly before putting ground ice in its abdomen. The fishes are then loaded in the cold storage hold on their boats maintaining a distance of 10-20 cm for every two fishes.

## Data Collection and Analysis

This study was conducted through a survey of three fishing wards representing the offshore tuna long-line fishery in Nha Trang, namely, Vinh Phuoc, Phuoc Dong and Xuong Huan. During the survey, face-to-face interview was conducted on 31 vessel owners, either at their homes or on board their vessels, accounting for only 10% of the total number of tuna long-line vessels in Nha Trang. For the analysis of the data gathered, the vessels were grouped into four (4) capacity groups, namely: (1) less than 60 HP; (2) 60 – 90 HP; (3) 90 – 140 HP; and (4) greater than 140 HP. There have been no apparent differences in the



*Semi-processed tuna stored on board the long-line vessels*

investment pattern among these four categories, and the values tend to distribute around their means.

### Total investments

The investment for the hull takes up 39.1-47.0%, for the engine 17.4-25.7%, mechanical equipment 5.6-8.7%, electronic equipment 4.6-6.6%, fishing gear 16.5-24.2%, and storage equipment 0.10-0.60%. The total investment for the tuna long-line operation in Nha Trang, is summarized in Table 1.

The average total investment for a tuna long-line vessel with sufficient equipment onboard, engine and fishing gear is 444.14 million Vietnamese Dong (VND) based on market value at the end of 2004. The average investment for the hull is 195.65 million VND, which is 44.1% of the total investments. Since the hull is made of wood, its price has increased dramatically starting in 2000 as a result of a government policy on forest conservation.

After the hull, the engine comes second in terms of investment priority, taking up an average of 103.71 million VND, which is equivalent to 23% of the total investment even considering that the vessel engines are usually second-hand but imported from other industrialized countries. This is followed by the fishing gear, which costs 90.53 million VND on the average, equivalent to 20.4% of the total investment. Compared with other offshore fisheries such as the tuna-mackerel gillnet operation, this figure is comparatively low.

In contrast, other items such as mechanical equipment, electronic devices, storage facilities and others comprise only a modest proportion of the total investment because the fishers think that such facilities do not have obvious relationship with productivity. However, this oftentimes led to negative consequences because the poor state of technological applications could result in accidents especially during big storms. There is always the risk of their vessels being damaged during typhoons because of the fishers' inaccessibility to meteorological information. Moreover, their high catch does not often mean high economic value because the fishers still use simple and even outdated storage means and facilities.

The way the fishers raise capital is often “relations-based,” obviously exhibiting the characteristic of Vietnam’s small-scale fisheries. “Joint investment” is based on kinship or in the case of “sole ownership,” one can ask loans from their neighbors. Bank is not a promising source of loans for many fishers because usually only a limited amount is offered by banks, averaging 91.94 million VND, which is only 20.70% of the total investment required per vessel. This confirms an almost no easy access to loans from financial institutions because fishing is always considered a risky business.

Nevertheless, a group of over 140 HP recently received a more generous loan of 328.33 million VND from banks, which is equivalent to 52.83% of a vessel’s total investment in 2005. This generous loan was facilitated through the country’s offshore fishery program, which makes it easier for fishers to acquire loans from banks for the purchase of vessels which are longer and with stronger engine capacities. This facilitates the adoption of more offshore fishing operations, and therefore, removing part of the pressure on the coastal resources due to overexploitation of the coastal areas.

### Cost of depreciation

The depreciation cost for one year, which is 27.18 million VND on the average, is determined by the initial investment value and estimated usage duration of the vessel, as shown in Table 2. Of all the items considered, the depreciation cost of the hull accounts for the largest part, averaging 9.32 million VND equivalent to 34.3% of the total cost of depreciation. This is consistent with the initial investment for the hull of the vessel. While the depreciation of the fishing gear is 31.8% of the total depreciation cost, this is higher than that of the engine, which is 18.6% on the average.

Although this seems to be inconsistent with the investment structure of the fishing gear and engine, the reason could be based on the fact that traditionally, the engine can be put in longer operation from 15 to 25 years inclusive of annual minor and major repairs. The mechanical and electronic facilities and storage equipment show compatibility between the total investment and depreciation costs at 12.2% and 15.2% on the average, respectively. Moreover, comparing the depreciation costs for the hull, there is no remarkable

**Table 1.** Total investments for tuna long-line vessels

Capacity group	Vessel Number	Investment (Unit: Million VND)						Total investment
		Hull	Engine	Mechanical equipment	Electronic equipment	Fishing gear	Storage equipment	
HP<60 (%)	5	123.00 (43.6%)	49.00 (17.4%)	24.70 (8.7%)	18.32 (6.5%)	67.21 (23.8%)	0.16 (0.10%)	282.39 (100.0%)
60<HP<90 (%)	11	176.36 (47.0%)	80.00 (21.3%)	24.64 (6.6%)	24.75 (6.6%)	69.48 (18.5%)	0.27 (0.10%)	375.51 (100.0%)
90<HP<140 (%)	9	195.56 (39.1%)	125.56 (25.1%)	29.61 (5.9%)	27.10 (5.4%)	121.11 (24.2%)	0.71 (0.10%)	499.64 (100.0%)
140<HP (%)	6	291.67 (46.9%)	160.00 (25.7%)	34.92 (5.6%)	28.68 (4.6%)	102.68 (16.5%)	3.55 (0.60%)	621.50 (100.0%)
Average (%)	31	195.65 (44.1%)	103.71 (23.4%)	28.08 (6.3%)	25.16 (5.7%)	90.53 (20.4%)	1.02 (0.20%)	444.14 (100.0%)

**Table 2.** Depreciation costs of long-line vessels

Capacity group	Vessel Number	Depreciation costs (Unit: Million VND)						Total investment
		Hull	Engine	Mechanical equipment	Electronic equipment	Fishing gear	Storage equipment	
HP<60 (%)	5	6.15 32.9%	2.45 13.1%	2.08 11.1%	1.19 6.3%	6.84 36.5%	0.02 0.1%	18.71 100.0%
60<HP<90 (%)	11	8.48 37.6%	3.94 17.5%	2.19 9.7%	1.58 7.0%	6.33 28.1%	0.03 0.1%	22.55 100.0%
90<HP<140 (%)	9	9.56 30.1%	6.11 19.2%	2.54 8.0%	1.82 5.7%	11.65 36.7%	0.07 0.2%	31.75 100.0%
140<HP (%)	6	13.17 36.7%	7.75 21.6%	2.74 7.6%	2.14 6.0%	9.83 27.4%	0.25 0.7%	35.87 100.0%
Average (%)	31	9.32 34.3%	5.07 18.6%	2.38 8.7%	1.70 6.2%	8.63 31.8%	0.08 0.3%	27.18 100.0%

difference among the vessels in the different categories. The depreciation costs of the hull vary from 30.1 to 37.6%. For the engine, the depreciation costs range from 13.1 to 21.6%, mechanical devices 7.6-11.1%, electronic devices 5.7-7.0%, fishing gear 27.4-36.7%, and storage facilities 0.1-0.7%.

### Cost of major repairs

For the cost of major repairs of the vessels, a comparison was made of the costs in 2004 with those in 2005. Thus, the cost of major repairs of the vessels was 17.43 million VND on the average in 2004 and 19.87 million VND in 2005, an increase of about 14% (Table 3).

The annual increase in repair costs may have been due to many factors that include:

- The cost for repair and maintenance of the hull averaged at 10.50 million VND in 2004, which increased to 12.31 million VND (by 17.2%) in 2005. This was due to increased fees for some cost-driven activities such as landing of vessels in shipyard, cleaning the hull surface, applying protective paints and other repair works. The increase in labor costs associated with the repair and maintenance services ranging from 10 to 15% of the total repair costs, also contributed to the high costs of major repair of the hull.

- With respect to the engine, its repair costs were mostly determined by the cost of replacing the piston rings and fixing some component parts that were not working properly, and also the practice of repairing the vessels' engine once every one or two years. Other engine repair work also contributed to the variable operating costs per fishing trip. Thus, the repair costs of the engine as a whole accounted for 5.28 million VND in 2005, about 7.5% increase than its cost in 2004 (4.91 million VND).
- Other devices, especially storage equipment, did not take much of the budget for major repairs, contributing only 1.69 million VND in 2004 and 1.95 million VND in 2005. This is because the storage equipment was mostly free from repair costs since the fishers only replace the insulating materials and plastic boxes, "accounting for a very minimal cost", said to the fishers.
- No marked change in terms of value was observed in the costs for fixing the fishing gears within the two-year period, because they contributed only a small proportion (less than 2%) to the total costs for major repairs. This could be due to the fact that that most fishers repair their fishing gears during the fishing operations, so the costs must have been added in the variable costs per fishing trip. Also as a practice, not many vessels have their fishing gears fixed at the same time as the hull and the engine.

**Table 3.** Major repair costs of long-line vessels

Major repair costs (Unit: Million VND)						
Capacity group	Vessel Number	Hull	Engine	Fishing gear	Others	Total
<b>2004</b>						
HP<60 (%)	5	9.00 55.6%	5.20 32.1%	2.00 12.3%	0.00 0.0%	16.20 100.0%
60<HP<90 (%)	11	10.33 57.0%	4.70 26.0%	0.00 0.0%	3.09 17.1%	18.13 100.0%
90<HP<140 (%)	9	11.22 66.9%	5.11 30.5%	0.00 0.0%	0.44 2.6%	16.78 100.0%
140<HP (%)	6	11.00 60.6%	4.75 26.1%	0.00 0.0%	2.42 13.3%	18.17 100.0%
Average (%)	31	10.50 60.3%	4.91 28.2%	0.32 1.9%	1.69 9.7%	17.43 100.0%
<b>2005</b>						
HP<60 (%)	5	10.40 58.8%	5.30 29.9%	2.00 11.3%	0.00 0.0%	17.70 100.0%
60<HP<90 (%)	11	11.34 58.2%	4.98 25.5%	0.00 0.0%	3.18 16.3%	19.50 100.0%
90<HP<140 (%)	9	12.33 69.4%	5.00 28.1%	0.00 0.0%	0.44 2.5%	17.78 100.0%
140<HP (%)	6	15.67 61.4%	6.25 24.5%	0.00 0.0%	3.58 14.1%	25.50 100.0%
Average (%)	31	12.31 62.0%	5.28 26.6%	0.32 1.6%	1.95 9.8%	19.87 100.0%

### The fixed costs

The fixed costs increased narrowly from 57.55 million VND in 2004 to 60.56 million VND in 2005 (Table 4), which was primarily driven by the rising costs of major repairs and loan interest payments. Meanwhile, the cost of depreciation, taxes and insurance exhibited no significant difference at all. The increase in loan interest payments convey a positive signal in the development of the offshore fishing industry. When a number of vessels (mainly those of the 90-140 HP capacity group) operated efficiently in 2005, the operators were granted additional loans from the banks. Thus, from the data collected in 2005, of the total fixed costs of 60.56 million VND, the cost of depreciation constituted the highest share of over 44.9%, followed by costs of major repairs (32.8%) and payment for loan interests (11.6%). Insurance accounted for only 5.5% of the total fixed costs because very few fishers insure their vessels. However, some banks have pressured the fishers to get themselves and their vessels insured in order to lower the risk factor on their loans. As a result, many fishers insured their vessels only for the purpose of getting their bank loans approved.

Tax payments contributed the smallest share in the total fixed costs (3.14 million VND per year) from 2004 to 2005. Classified as business tax, income tax and resource tax, the fishers' taxes are generally lower than the taxes from other forms of business enterprises.

The fishers' business tax enjoys a 50% cut, their income tax is 3-7% of their profits, and their resource tax is equivalent to 0.5-1% of the total revenue. Since the taxes are paid at fixed rate, not on a case-by-case basis, vessels with poor production still have to fulfil their tax duty as the good producers.

This exposes the inadequacy in the fishing tax policy but starting in 2006, as incentive to the fishers, they were exempted from payment of all kinds of fishing taxes and this policy is valid for five (5) years. Moreover, the total fixed costs increased with the vessel capacity groups, notably vessels of over 140 HP paid fixed costs of around 1.5 times higher as those of the 90-140 HP capacity group. This can be explained by their larger loans giving rise to high loan interests and bigger insurance policies.

### The variable costs

On the average, variable costs totaled 527.2 million VND in 2004 and 579.1 million VND in 2005, an increase of 9.84% (Table 5). Fuel cost was 274.21 million VND in 2005, an increase of nearly 32% from the fuel cost in 2004 (207.85 million VND), which was governed by the reality that diesel prices increased by 1.42 times during the period. Diesel was the main fuel used for the vessels during their fishing trips.

**Table 4.** Fixed costs for long-line vessels

Fixed costs (Unit: Million VND)							
Capacity group	Vessel Number	Major repairs	Loan interests	Tax	Insurance	Depreciation	Total
<b>2004</b>							
HP<60 (%)	5	16.20 39.0%	3.08 7.4%	2.10 5.0%	1.50 3.6%	18.71 45.0%	41.59 100.0%
60<HP<90 (%)	11	18.13 36.0%	4.36 8.7%	3.22 6.4%	2.11 4.2%	22.55 44.8%	50.37 100.0%
90<HP<140 (%)	9	16.78 29.9%	3.85 6.9%	2.75 4.9%	0.96 1.7%	31.75 56.6%	56.09 100.0%
140<HP (%)	6	18.17 21.1%	17.16 19.9%	4.43 5.1%	10.60 12.3%	35.87 41.6%	86.23 100.0%
Average (%)	31	17.43 30.3%	6.48 11.3%	3.14 5.5%	3.32 5.8%	27.18 47.2%	57.55 100.0%
<b>2005</b>							
HP<60 (%)	5	17.70 41.1%	3.08 7.1%	2.10 4.9%	1.50 3.5%	18.71 43.4%	43.09 100.0%
60<HP<90 (%)	11	19.50 37.5%	4.68 9.0%	3.22 6.2%	2.11 4.1%	22.55 43.3%	52.06 100.0%
90<HP<140 (%)	9	17.78 30.3%	5.41 9.2%	2.75 4.7%	0.96 1.6%	31.75 54.1%	58.65 100.0%
140<HP (%)	6	25.50 27.3%	17.16 18.3%	4.43 4.7%	10.60 11.3%	35.87 38.3%	93.56 100.0%
Average (%)	31	19.87 32.8%	7.05 11.6%	3.14 5.2%	3.32 5.5%	27.18 44.9%	60.56 100.0%

Fish bait consumed 38.85 million VND in 2004 and this increased to 42.52 million VND in 2005 by 9.45%. Since the long-liners use squid or fish as baits, and the price of squid fluctuated in 2005, the cost of the bait also exhibited certain increases. In 2005, provisions (e.g., food) and storage costs escalated by 10% and 4.4% from 2004, respectively. These increases coincided with the general increase of the CPI (consumer price index) in 2005, and the tendency of the fishers to stock more provisions and ice in order to decrease the number of restocking trips, shielding them against the soaring prices of fuel. Minor repair cost also exhibited an increase, which were shared among such items as frequent repairs of the electronic devices, mechanical devices, engine, hull and fishing gears.

Notwithstanding the upward tendency of the other variable costs, labor costs dropped from 178.6 million VND to 153.95 million VND from 2004 to 2005 at a rate of 18.3%. This could be due to the fact that wages were measured by certain percentage of the revenue less the variable costs (exclusive of wage). Both revenues and variable costs increased in 2005 but the increase rate of the variable costs (22%) was much higher than that of revenues (4%). As can be observed from the structure of the variable costs, fuel ranked first followed by labor costs. The costs of provisions and baits did not register a considerable

difference in proportion. The least costs were for storage and minor repairs. In summary, the total variable costs of the vessel group of 90-140 HP were highest in 2004 and 2005 because as has been well-documented, these capacity groups operated efficiently with more frequency of fishing trips.

### *The total earnings*

The results of the survey indicated that the average earnings decreased from 113.40 million VND in 2004 to 87.34 million VND in 2005, a reduction of about 23% (Table 6). In this case, the increases of the revenues and the variable and fixed costs were indirectly proportional to the earnings, which decreased from 113.40 million VND in 2004 to 87.34 million VND in 2005. Specifically, the total revenue was 726.97 million VND in 2005 up by 4.13% relative to that of 2004 (698.16 million VND). The total cost (variable and fixed costs) was 639.63 million VND in 2005 an increase of only 9.38% from 2004 (584.76 million VND)

Although the earnings of the vessels in the less than 60 HP capacity group, dropped dramatically by 35.27% their revenues were almost constant during the period from 2004 to 2005: 475 million VND and 470 million VND, respectively. While the variable costs increased sharply due to fuel hike, the respondent-fishers from this vessel capacity group were

**Table 5.** Variable costs for long-line vessels

Variable costs (Unit: Million VND)								
Capacity group	Vessel Number	Fuel	Storage	Bait	Food	Minor Repairs	Wage	Total
<b>2004</b>								
HP<60 (%)	5	134.88 37.6%	18.31 5.1%	21.50 6.0%	33.40 9.3%	20.06 5.6%	130.09 36.3%	358.24 100.0%
60<HP<90 (%)	11	155.85 36.8%	22.37 5.3%	28.91 6.8%	42.95 10.1%	25.55 6.0%	147.62 34.9%	423.25 100.0%
90<HP<140 (%)	9	300.80 40.3%	36.83 4.9%	63.22 8.5%	50.78 6.8%	40.99 5.5%	252.87 33.9%	745.49 100.0%
140<HP (%)	6	224.59 42.3%	26.25 4.9%	35.00 6.6%	41.33 7.8%	39.58 7.5%	164.45 31.0%	531.21 100.0%
Average (%)	31	207.85 39.4%	26.67 5.1%	38.85 7.4%	43.37 8.2%	31.86 6.0%	178.61 33.9%	527.21 100.0%
<b>2005</b>								
HP<60 (%)	5	181.74 47.5%	20.54 5.4%	17.70 4.6%	38.20 10.0%	20.16 5.3%	103.93 27.2%	382.27 100.0%
60<HP<90 (%)	11	206.72 49.1%	22.91 5.4%	29.23 6.9%	44.27 10.5%	23.82 5.7%	93.94 22.3%	420.88 100.0%
90<HP<140 (%)	9	399.21 46.4%	38.51 4.5%	77.56 9.0%	61.33 7.1%	46.11 5.4%	238.37 27.7%	861.09 100.0%
140<HP (%)	6	287.52 47.1%	27.00 4.4%	35.00 5.7%	41.92 6.9%	39.58 6.5%	179.03 29.3%	610.05 100.0%
Average (%)	31	274.21 47.4%	27.85 4.8%	42.52 7.3%	47.79 8.3%	32.75 5.7%	153.95 26.6%	579.07 100.0%

engaged in other forms of employment when production was low, so their revenues were still stable.

The 60-90 HP capacity group recorded the biggest plunge in earnings from 85.29 million VND in 2004 to 32.15 million VND in 2005, at a decreasing rate of 62.3%. Comparing the 60-90 HP capacity group with the less than 60 capacity group, the total costs of the former remained almost unchanged in two years while the total costs of the latter increased only at a minimum rate (from 399.83 million VND in 2004 to 425.36 million VND in 2005). However, the revenues of the former group decreased from 558.9 million VND in 2004 to 505.1 million VND in 2005, while in the latter group the total operational revenue in two years was almost stable because the effect of the fuel hike was dwarfed by the corresponding decline in labor costs.

The remarkable decrease in revenue for the 60 – 90 HP capacity group was also derived from the fact that offshore tuna catches recorded a slumpdown in certain times of the year of the survey and this vessel capacity group did not resort to other supplementary activities for extra compensation. It should be noted that in 2005, most vessels experienced a fall in profits, except for the capacity group of over 140 HP. Revenues of this capacity group was 693.33 million VND in 2004 and increased to 786.67 million VND in 2005 at an increasing rate of 13.46%. This sends a signal for the other capacity groups having only a minimum increase or even a fall in revenues, to invest in bigger size vessels. The advantage brought about by high engine capacity led to an increase in the size and radius of their fishing operations, enabling the vessels to harvest in offshore areas especially in the underexploited fishing grounds, thus

resulting in higher production. The increase in their revenues shows that vessels of over 140 HP capacity group can operate with a profit of 9.43% although the total costs were higher in 2005 relative to that of the previous year.

However, the vessels of the 90-140 HP capacity group still had the best earnings at a level of twice as much as those of the over 140 HP capacity group. Therefore, from the data collected in two years, the vessels of the 90-140 HP capacity group enjoyed the highest financial efficiency. The Returns on Equity (ROE) in the tuna long-line operations of this capacity group was highest, 42.4% in 2004 although its ROE decreased to 39.2% in 2005, still it had the highest ROE in 2005 from among the capacity groups compared. This ROE was still much higher than interest rates of 8% - 9%/year offered by banks. In summary, the highest efficient operators were those from the 90-140 HP capacity group because of their ROE of 42.4% in 2004 and 39.2% in 2005.

Due to increased in profit, the ROE of the vessels from the over 140 HP capacity group increased from 25.9% in 2004 to 28.3% in 2005. This made the vessels from the over 140 HP capacity group rank second among the efficient operators, next to the 90-140 HP capacity group. Considering the two indicators (returns on capital and returns on equity) in 2005, the earnings of the over 140 HP capacity group was 13.4% whereas the ROE was 28.3%, the same pattern was also observed in 2004 (12.2% and 25.9%, respectively). Debt ratios may be a significant determinant causing the variations of the two indicators considered. The over 140 HP capacity group often gets higher loans (52.83%) compared to the other groups that get only less than 10%.

**Table 6.** Earnings of the long-line vessels

Earnings (Unit: Million VND)							
Capacity group	Vessel Number	Revenues	Variable costs	Fixed costs	Earnings	Returns/ Total capital	Returns on Equity (ROE)
<b>2004</b>							
HP<60	5	475.00	358.24	41.59	75.17	26.6%	29.1%
60<HP<90	11	558.91	423.25	50.37	85.29	22.7%	24.9%
90<HP<140	9	995.56	745.49	56.09	193.97	38.8%	42.4%
140<HP	6	693.33	531.21	86.23	75.89	12.2%	25.9%
Average	31	698.16	527.21	57.55	113.40	25.5%	32.1%
<b>2005</b>							
HP<60	5	474.00	382.27	43.09	48.64	17.2%	18.8%
60<HP<90	11	505.09	420.88	52.06	32.15	8.6%	9.4%
90<HP<140	9	1098.89	861.09	58.65	179.15	35.9%	39.2%
140<HP	6	786.67	610.05	93.56	83.05	13.4%	28.3%
Average	31	726.97	579.07	60.56	87.34	19.7%	24.8%



In principle, the higher the debt ratio, the larger is the ROE and vice versa.

Therefore, to some extent, loans also contribute to the capital efficiency, but not in all cases because when the lendings are granted excessively, the fishers are put under enormous pressure as they are at risk of getting bankrupt especially when the catch is low.

## Conclusion

The initial findings revealed that high engine capacity does not automatically translate into large profits. Vessels of 90–140 HP prove to be the best performers from among the capacity groups sampled. Those vessels of greater than 140 HP capacity group had increase in earnings and their ROE indicator stayed fairly high in 2005. In spite of this, investment decisions for this capacity group need to be carefully considered since the estimated earnings seem to be not satisfactory vis-à-vis the required total investment. Furthermore, the effect of loans on the ROE should be included when the performance efficiency of this vessel capacity group is examined in future studies. In addition to the impact of fuel prices – an external contributor to the rise in costs could have also caused the profits to plunge down. There must be other components causing the drop in the revenues or production that need further investigation. However, the identification of the elements influencing operational efficiency of offshore tuna long-liners could be established from the initial results of this study. Hopefully, the efforts of the authors will form an integral part in the sustainable development of offshore tuna long-line fishery in a wider scale in Nha Trang, Vietnam.

## References

- Different approaches to efficiency analysis-An application to the Spanish Trawl fleet operating in Moroccan waters, European Journal of Operational Research.
- Economic performance indicators for fisheries, Australian Bureau of Agriculture and Resource Economics.
- Economic indicators for the South Australian Pilchard Fishery, EconSearch Pty Ltd.
- Long Kim Le, Ola Flaaten and Kim Anh Thi Nguyen, Economic performance of offshore long-line vessels in Nha trang, Vietnam
- Tuan Nguyen, Kim Anh Thi Nguyen, Ola Flaaten, A study on costs and earnings of gillnet vessels in Nha Trang, Vietnam
- Websites: [www.gso.gov.vn](http://www.gso.gov.vn), [www.fistenet.gov.vn](http://www.fistenet.gov.vn), [www.mofi.gov.vn](http://www.mofi.gov.vn), [www.baokhanhhoa.com.vn](http://www.baokhanhhoa.com.vn)

### About The Authors

Dr. Kim Anh Thi Nguyen, Tam Ngoc Dang Thi, Dung Thi Phan, Tram Anh Thi Nguyen are Lecturers from 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 Tromsø, N-9037 Tromsø, Norway

## CALL FOR ARTICLES

Several issues of Fish for the People were already published from 2003 to 2006 and the Publication is now on its Fifth Volume. We are inviting in-house writers who are interested in promoting the activities of SEAFDEC in the Southeast Asian region as well as writers from the SEAFDEC Member Countries, to contribute articles for the Publication.

Fish for the People takes several sections, such as: Special Feature (usually giving a theme to the issue), Fisheries Management, Aquaculture, Fish Trade and Post-harvest Technology, Announcements on important SEAFDEC events, and the Event Calendar.

Fish for the People is currently a free publication. It receives a generous support from the Government of Japan's Trust Fund. The Publication primarily intends to make known the activities of SEAFDEC as well as other relevant fisheries issues from the SEAFDEC Member Countries. While the focus is on promoting fishery issues in the Southeast Asian region, we also welcome articles on

important fishery issues from other regions external to SEAFDEC.

An Editorial Team for the Publication was organized in 2006 comprising the editor-representatives from the SEAFDEC Departments. Writers from the Departments are therefore, requested to contact their respective Editor-Representatives or they can also communicate directly to the Secretariat-based Editors ([fish@seafdec.org](mailto:fish@seafdec.org)).

The Publication is policy-orientated. It is not a forum for research findings and it is not also intended to provide detailed technical information. In other words, the Publication does not contain typical scientific papers but instead articles that are in popular or layman language and easy to read papers especially to all our stakeholders. Popular and readable articles that address the various issues discussed at the ASEAN-SEAFDEC Millennium Conference will be most desired. The articles could also discuss newly emerging issues relevant to the sustainable development of fisheries in the Southeast Asian region.