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Viability of Trawl Fishing Fleet in Foça (the Aegean Sea), Turkey and Some Advices to Central Management Authority

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Abstract

This study was conducted in Foça (The Aegean Sea) during the 1999-2000 fishing season. It reveals trawl fishery from socio-economic point of view. Economic and financial performance of trawl vessels were carried out and economic viability of fishing enterprises were discussed as well. Trawl vessels were divided into three groups according to capacity of fishing gear, and non-parametric test Kruskal-Wallis analysis was used to test the differences between these groups ($p<0.05$). Findings indicate that increasing fuel price adversely affected the financial results. Solely fuel made 41,3% of the operating costs of trawl vessels. This is six times more than that prevails in EU countries. In terms of profitability, 45% of trawl vessels had no profit at all. As there is strong connection between economics and management of fishery, managerial authorities should consider that fishery cannot be managed without monitoring economics situation and take into account of these kinds of studies.

Key Words: Fisheries economics, fisheries management, trawl fishery, viability, the Aegean Sea.

Introduction

Foça with a population of approximately nine thousand inhabitants located on the coast of Central Turkish Aegean Sea characterised as multi-species and multi-gear fishing such as trawling, gillneting, long lining, lift neting, purse seining. With a total of 52 species, Foça (the Aegean Sea) shows typical characteristics of Mediterranean fisheries that are generally of a multi-gear and multi-species in nature (Figure 1).

In terms of fish production and income contribution to the local and national economy, trawl fishery is the most important fishing method among the four fishing methods that are used in Foça (Ünal, 2001). Therefore, trawlers dominate the fishing fleet. Trawl fishery employs 74 fishers in Foça. Crew size is 3 to 5 fishers including skipper. Each trip generally lasts for a day or two.

Red mullet (*Mullus barbatus* L., 1758), stripped red mullet (*Mullus surmuletus* L., 1758) and hake (*Merluccius merluccius* L., 1758) are the major fish species in trawl fishery, and there is always a demand in the market for these species. *Mullus spp*. have always been target species for trawl fishery in Turkey. Ünal and Hoşsucu (1996) reported that 67% of gross revenue consists of these species in trawl fishery in Foça.

Since trawl fishery has started in the region in the late 1940s (A. Yaman and N. Turguttekin, pers. comm.), trawl fishermen introduced several management techniques such as closed season, mesh size regulation, closed area but at the same time number of trawlers, engine power, and vessel length increased continuously. Due to economic importance and high value of the target species, fishermen have been directed to the fishery, and depressed catch rates and economic returns necessitating the need for effective management.

There were only 5 trawl vessels in the region at the beginning. Maximum length was 18 meters and engine power was 90 HP in 1940s. Factors like increased human population and its demand for fish, rich and productive fishing ground of Foça, lead to uncontrolled fishery that consequently leads to excessive fishing effort for many years. Bigger size and more powerful trawlers came to the region from the Black Sea and increased fishing effort (A. Yaman and N. Turguttekin, pers. comm.). The Ministry of Agriculture and Rural Affairs (MARA), central authority responsible for fishery, generally followed populist policy and started licence system in 1997 which was too late. However, limitation on number of vessel through licence system was cancelled again from June 2001 to December 31, 2001 without taking into account of any of the scientific studies or research reports only for six months. In this short time period many new fishing vessels entered to fishery. At present, the licence system is in power but quite far from restricting the fishing effort.

Till now trawl fishery has been managed by fishery biologists or fishery managers who are related to only fishery biology, zoology or agriculture even veterinarian but not by fisheries economists or a committee that consists of biologists, economists, ecologists, representatives of fishery organisations or other component of fishery. Therefore, fishery has

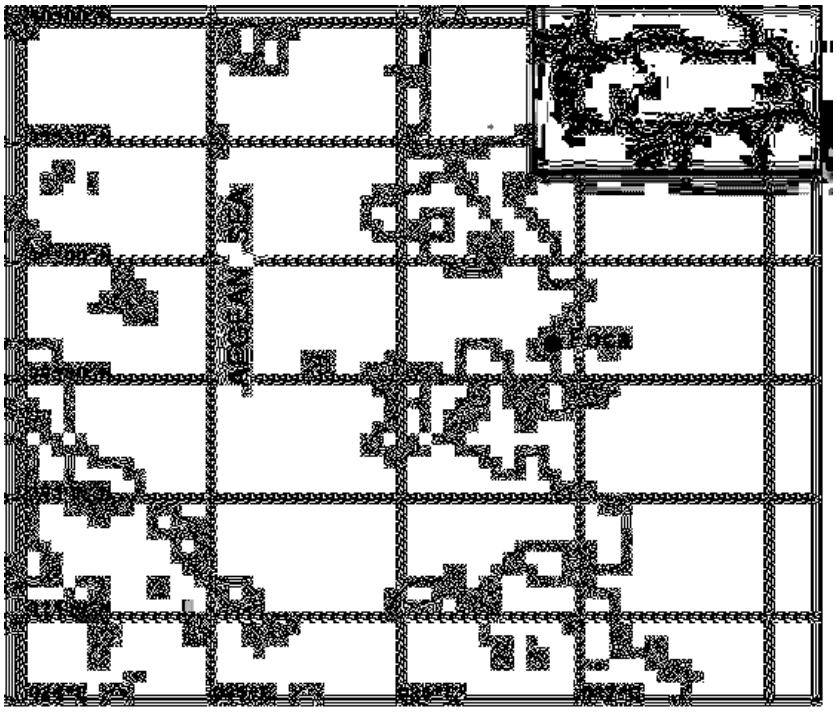

Figure 1. Location of Foça.

been regulated principally by closed season, minimum mesh size based on biological principles. Mesh size regulation of trawl cod-end (44 mm) based on *Mullus barbatus* which is quite far from ecosystem approach to fisheries management. Economic objectives of the fisheries have never been considered. No notable economic regulations such as buy-back programme, tax regulations, restriction on fishing capital or restriction on fishing effort concerning trawl fishery were in force until now. Hannesson (1993) reported that property rights, taxing landing or fishing effort and individual transferable quotas are important management tools in most of the cases. In addition, according to review of Sinclair *et al.* (2002), Sutinen and Soboil (2003) emphasized by reviewing the experience of various fisheries management systems that the property rights-based regimes, most often in the form of individual fishing quotas, have been more effective in conserving fish stocks, reducing fishing effort and generating resource rent than any other method of fisheries management. In fact, according to the empirical evidence they reviewed, no other method of fisheries management has shown any significant degree of success in these respects.

Fisheries economics is already well developed in many countries and that it is widely used for management purposes. However it is very new discipline in Turkey and there is practically no comprehensive studies on it. Therefore, fishery in Turkey is trying to be managed without economic monitoring. Somehow it is still standing and not collapsed but shows several apparent signals in the way of sustainability especially from the economic point of view.

Present study takes into consideration all the above mentioned approaches to fishery management and includes economic performance of one year fishing season (July 1999 to July 2000) of trawl vessels harbouring in Foça. The study, therefore, is designed to help decision-making and to give some socio-economics indications to the management authority.

Materials and Methods

This paper depends on primary data collected by face-to-face interviews with all of the trawl fishers who were active during 1999-2000 in Foça. A total of 20 regional trawler captains were interviewed from June to December 2000 as part of an Ege University Research Fund Accountancy project. Data were collected on operating costs, earnings, vessel characteristics, fishing effort, employment on board, fishing experience of fishermen, age, education level, and social security. Open-ended questions were also asked on problems and opinions related to present situation of the fishery, fishermen, and management techniques.

As Hannesson (1989) mentioned in Cypriot fishery the opportunity cost of capital reflects here the alternative 10 percent rate of return if capital were invested in a different field.

The records of MARA's Protection and Control Department and records belonging to fishing cooperatives were used as secondary data. Total number of licenced vessel was obtained from the

records and then active trawl vessels were determined in the region by personal observation.

Fishermen usually seem to adjust their real costs and earnings in ways that do not show up in normal accounting. They usually exaggerate their problem. Therefore, two to three days per week were spent with fishermen in the region during the year just to establish a sincere relation with the fishermen to collect reliable data. In addition, weekly monitoring of trawl fishing operation, landing and costs data, which were obtained only from captains of trawl vessels, was used to analyse survey data.

Value of landings data and costs were used to calculate economic and financial performance, net profit (NP), gross cash flow (GCF) which are accepted as economic performance indicators and commonly used in the different countries. NP (value of landings minus all costs, including depreciation and an imputed interest amount), GCF (value of landings minus all expenses, except depreciation and interest) are same as those have been developed during the Workshop on an Annual Economic Report, held in Brussels, 20-23 February 1995.

The economic performance is assessed through the ratio net profit/total earnings (NP/TE). The financial performance is assessed through the ratio net profit/capital investment also called return on investment (ROI) (Tietze *et al*., 2001).

In the present study, trawlers were divided into three groups according to capacity of fishing gear in order to understand relation between profitability and capacity of fishing vessel. Length size and engine power were considered for grouping. To test the differences between these groups non-parametric test Kruskal-Wallis analysis was used ($P<0.05$).

Results

The mean length of the twenty vessels covered in the personal interviews was 21 meters with a range of 15-24 meters. 11 of the vessels were made of wood and rest were of steal construction. The average horsepower was 324 HP with a range of 135-600 HP. Five trawl vessels engines had 400 HP and over. Mean age of the twenty vessels was 17.3 years. The range was 4-57 years but there were only 3 vessels less than 5 years old and 11 of them were older than 10 years. The average crew number including the captain on the twenty vessels was 4. The actual range was 3-5. One of the four was a family member.

Average fishing experience of the crew was 19.7 years while mean age is 38.7 years. The range of fishing experience and age of trawl vessels captains was 5 to 44 years and 24 to 64 years respectively. 85% of them were married and had their own house. The average monthly wage of deckhands in the trawl fishing fleet during 1999-2000 fishing season was USD 331.5.

Annual fishing days were 182 and average fuel consumption was about 47.5 tons/year/vessel. The range of fishing days and fuel consumption was 110 to 270 days per year and 20 to 94.5 tons per vessel.

Trawl fishing fleet of the Foça discussed in this paper employed 74 people on board. The value of total production amounted to USD 2 million but some of the trawl vessels show average crew share below USD 200 per man in a month.

Trawl fishermen stop fishing, because of low fish price, low catch amount and marketing problems from time to time. High fuel price and operation costs also discourage fishing. The mean annual operating cost for the twenty vessels was USD 77489.5. Fuel cost was the highest rate of 41.3% within these operating costs. However, fishermen with bigger vessels and engine go for fishing under all circumstances and they are at more risk and try their chance in unknown fishing grounds, international waters of the Aegean Sea, in 60-80 miles away from fishing harbour.

Trawl vessels generate about USD 2 million during the fishing season but in spite of the fact that they contribute well to the local and national economy, only 11 of the twenty trawl vessels had profits for 1999-2000 fishing season, amounting from 2 to 48 per cent of gross revenue (Table 1).

As mentioned above, 9 out of the 20 trawl vessels covered by the study had losses after deducting costs related to depreciation and interest. Of these trawl vessels; however, 5 have still a positive gross cash flow and only 4 vessels suffered operational losses.

Discussion

Results of the study indicate that increasing fuel price adversely affected the 1999-2000 financial results for trawl fishery. Fuel costs made up 41,3% of the operating costs of trawl vessels. According to Anon. (2003), this is six times more compared to EU countries' trawl fishery operating costs.

In terms of profitability and economic viability, almost half of trawl vessels had losses. This is not an unexpected result in common property fisheries. On the contrary, it is much anticipated case in the long run. Hannesson (1986) also pointed out that since access to the resource is free and open, the surplus profit would attract new fishermen and vessels; thereby increasing total costs but without a commensurate increase in total revenues. Capital and labour will continue to enter the fishery until all economic rents are dissipated and profits to individual units are reduced to the level of their opportunistic costs.

Fishermen are still going on fishing in the region but only 75% of all have positive gross cash flows and fully recovered their costs of operation. How those 25% trawl vessels with negative gross cash flows, will continue to fishing can be explained that

Table 1. Economic performance of trawl vessels, 1999-2000 (000 USD/year)

Trawl Vessels Groups	Trawl No	Gross Revenue	Net Profit	GCF	NP/TE (%)	ROI (%)
I. Group 15m<n=5<18m	1	18.1	-25.1	-16.6	-	-
	2	55.8	-3.0	8.8	-	-
	3	248.4	118.5	135.3	47.7	114
	4	73.0	4.8	15.6	6.5	6
	5	61.2	4.5	14.0	7.3	7
II. Group 19m<n=8<21m	6	81.6	9.9	22.4	12.1	11
	7	28.9	-29.9	-17.1	-	-
	8	151.7	55.6	68.9	36.6	60
	9	112.3	13.5	26.8	12	15
	10	47.7	-6.3	3.9	-	-
	11	106.3	26.9	36.4	25.3	41
	12	59.0	-29.4	-17.8	-	-
	13	45.4	0.5	12.9	1.1	1
III. Group 22m<n=7<24m	14	50.6	-6.6	6.4	-	-
	15	169.5	51.5	63.3	30.3	62
	16	210.7	40.5	60.6	19.2	31
	17	259.7	59.9	83.2	23	40
	18	56.5	-34.6	-22.3	-	-
	19	74.4	-27.6	-19.3	-	-
	20	81.4	-14.9	5.6	-	-

they do not take into account their own labour cost, capital cost or depreciation. As long as they have hope to catch more and earn more than their fuel costs they will continue fishing, but there is an economic loss here that must be taken into consideration by capital owner as well as central fisheries management authority.

It appears that the fleet is aging in general and a few fishermen have a tendency to build new, bigger and more powerful vessels. Moreover, it does not always mean that larger the vessel is gaining better income. Results of the study support this judgment because it was found that there is no statistically significant relation between the magnitude of fishing vessels and the net profit in Foça. To test the differences between three groups non-parametric test Kruskal-Wallis analysis was used and there were no statistically significant difference between three groups (Chi-square; 0.107 p = 0.948). In other words, there was no statistically significant relation between the magnitude of fishing vessels (size-engine power) and the net profit.

High cost fishing cannot survive in the long-run. Fishery should have a management such with guarantee sufficient wages for crews, sufficient income for the owners of the vessel, consumer satisfaction, and conservation for the fish stocks as King (1995) also mentioned for definition of modern fishery management. To ensure the long-term survival of living marine resource and the profitability of fisheries, new socio-economic and ecological strategies are urgently needed. Effective monitoring, control and surveillance are compulsory to establish a sustainable fishery and to preserve marine resources as well as fishermen community. Such studies are reflecting apparent signals to the management authority and further research at the local level is required. It can be suggested that management authority should take into account the results of these studies and realize that fishery cannot be managed without monitoring economic condition as there exists a strong connection between economics and fishery management. Central fishery officers from Ankara cannot manage fishery in Foça such a small fishing district. If they insist on this, it becomes mismanagement rather than management. As a result, solution must be established at the local level but first of all, central management authority should change its fishery policy, management instruments and reorganize the fisheries management regime in the way of privatization. It is high time to delegate government responsibility to fishermen's cooperatives associations and other related interested groups. In short term, the most suitable management instrument for trawl fishery in Foça is to stop licensing the number of vessels and limit the fishing effort not only in the form of number of licences but also all other forms of effort. Hannesson (1986) reported that all these attempts work only if governments regulate fishing effort at the local level and start to set strict input controls in the fishery.

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