



Journal of Applied Sciences

ISSN 1812-5654

science
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SWOT Analysis of Fishery Sector in Turkey

¹Hasan Akca, ²Murathan Kayim and ¹Murat Sayili

¹Department of Agricultural Economics,

Agricultural Faculty of Gaziosmanpasa University, 60240 Tokat, Turkey

²Almus Fishery College of Gaziosmanpasa University, 60900 Almus-Tokat, Turkey

Abstract: Drawing whole picture of a sector is important for accurate policy making. This study explores current constraints and future possibilities of the fishery sector in Turkey. Despite of its huge fishery potential, results of SWOT analysis show that Turkish Fisheries are generally limited to coastal fishing. Compared to European countries support given to the fishery sector is insufficient inhibited by bureaucracy. Aquaculture presents important sustainable business opportunities for rural development if better policies are adopted together with investment of efforts aimed at changing consumer's preferences.

Key words: Turkish fisheries, SWOT analysis

INTRODUCTION

Fisheries are an important source of foreign exchange, employment (Alam and Thomson, 2002), raw material for the industrial sector, and animal protein supply for human consumption. Average per capita fish consumption in the world has increased from 8.9 kg in 1961 to 15.8 kg in 1996. Ye (1999) predicted that demand for fish and fishery products in the world would continue to grow to about 183 million tons by 2030 and is considered as capable of bridging over the ever-widening gap between supply and demand of aquatic food products (De Silva, 2003).

Despite their huge potential, marine fisheries in Turkey are generally limited to the coastal area's. However, aquaculture, on the other hand, has been

steadily increasing. Eight hundred freshwater and marine aqua farms are actually operational (Rad and Koksall, 2000). From 1970s to 1999 the number of licensed fish farms have increased from 2 to 1444 (Memis *et al.*, 2002).

Out of 225 countries, Turkey is ranked 30th in aquaculture production and 31st in marine fisheries. Data on production, consumption, export and imports of fishery products in Turkey in years 1988 to 2002 is presented in Table 1.

Sea fish constitute 78.59% of total fishery products. The shares of aquaculture, freshwater fish and other sea products are 9.74, 6.99 and 4.66%, respectively in 2002. 51.03% of marine fish were caught in the East Black Sea, 26.39% in the West Black Sea, 13.79% from the Sea of Marmara, 6.59% from the Aegean Sea and 2.18% from the Mediterranean Sea (SIS, 2004).

Table 1: Production, export, import and consumption of Fishery products in Turkey

Years	Production (tons) (1)	Exports (tons) (2)	Imports (tons) (2)	Processed at fish meal and oil factories (tons)	Not processed or consumed (tons)	Domestic consumption (tons)	Mid-year population (000)	Per capita consumption (kg) (3)
1988	676 004	20 025	3 952	162 040	28 888	469 003	53 715	8.731
1989	457 116	25 957	5 682	84 826	7 531	344 484	54 893	6.276
1990	385 114	23 065	16 500	24 045	9 162	345 342	56 095	6.156
1991	364 661	14 394	24 037	58 856	7 295	308 153	57 326	5.375
1992	454 346	12 744	36 260	29 598	8 047	440 217	58 584	7.514
1993	556 044	13 649	33 573	98 231	10 580	467 157	59 869	7.802
1994	601 104	14 635	25 695	106 695	5 198	500 332	61 183	8.177
1995	649 200	14 000	30 639	51 200	4 929	609 712	62 526	9.751
1996	549 646	12 785	29 648	17 842	8 103	540 564	63 898	8.460
1997	500 260	18 402	39 829	21 000	10 348	490 339	65 300	7.510
1998	543 900	11 558	31 417	30 000	4 824	528 935	63 451	8.336
1999	636 824	15 955	39 552	150 000	7 172	503 249	64 385	7.820
2000	582 376	14 533	44 230	71 000	2 309	538 764	65 293	8.251
2001	594 977	18 978	12 971	62 755	8 383	517 832	68 618	7.547
2002	627 847	26 860	22 532	156 000	1 230	466 289	69 626	6.697

(1) Includes the sum of sea fish, crustaceans, mollusc, aquaculture and freshwater fish. (2) Includes unprocessed fishery products. (3) Includes fresh, chilled, smoked, frozen, salted, canned and other types of fish. Source: SIS (2004)

Corresponding Author: Hasan Akca, Department of Agricultural Economics, Agricultural Faculty of Gaziosmanpasa University, 60240 Tokat/Turkey Fax: ++90 356 252 14 88

The aim of this study is to explore current constraints and future possibilities of fishery sector in Turkey. Because drawing whole picture of a sector is very important to make accurate policies and guide producers in order to make their business more productive and more efficient in the light of future EU accession and developments in the field of fishery sector throughout the world. The general beneficiary of the study are policy makers, government authorities, fishery farms, consumers, fishery industry representatives and fishery scientists, etc.

MATERIALS AND METHODS

The past and present situation and also future possibilities of fishery sector in Turkey were evaluated using SWOT analysis technique. SWOT stands for Strengths, Weaknesses, Opportunities, and Threats (Henricks, 1999; Houben *et al.*, 1999). This technique is very helpful while exploring current constraints and future possibilities of any sector through a systematic approach of introspection into both positive and negative concerns.

RESULTS AND DISCUSSION

The following results were obtained by authors' SWOT analysis.

Strengths

Many natural and dammed lakes: According to General Directorate of State Hydraulic works, there are 48 natural, and 66 dam lakes (reservoirs with a surface area of 5 km² and over) throughout Turkey in addition to having 8,000 km of coastline (Marmara Sea, Mediterranean Sea, Black Sea, Aegean Sea, Bosphorus, Dardanel and Islands). The area of lakes (natural, dam, and man-made lakes) is nearly 1,200 hectares. The length of plentiful rivers are 175,714 km. These resources are rich in fish and other marine and freshwater products (Muthoo and Onul, 1996).

Different kinds of fish: There are some 247 known marine species in the Black Sea, 200 in the Sea of Marmara and 500 in the Mediterranean (Muthoo and Onul, 1996). The marine fishing grounds are the Black Sea (anchovy, mullet, bonito, whiting, horse mackerel, etc), the Marmara Sea (anchovy, mullet, bonito, whiting, tuna, shrimp, etc), the Aegean Sea (sea bream, sea bass, octopus, squid, sardine, sword fish, bonito, tuna, shark), and the Mediterranean Sea (tuna, sardine, octopus, squid, calamari, shrimp, etc). Main production areas for bivalves and molluscs are west and middle Black Sea (for processed the baby clam), Dardanalle-Bosphorus (for live

black mussel, bearded mussel, clam, oyster and cockle) and Ayvalık region (for live black mussel, bearded mussel, clam, oyster and cockle) (FAO, 2002).

Many fishery colleges, faculties and research institutes:

Until 1982 fisheries education was part of other related sciences such as biology and animal husbandry. After establishment of Higher Education Council, the number of Fishery Colleges (2 years) and Fishery Faculties (4 years) have been increased year by year. At present there are 25 Fishery Colleges throughout Turkey. More than one thousand students enrol to these education associations every year and they graduated from these training centers as technicians. Nearly five hundred students attend fishery courses at 10 fishery faculties. In addition, many people are trained at Fishery Research Institutes managed by Ministry of Agriculture and Rural Affairs via short-term courses.

Weaknesses

Inadequate cooling chain (deep freezing) at the stage of marketing: All freshwater fish and more than 75% of marine fish are consumed fresh. Two-thirds of total fish productions are sold direct to wholesalers. Only over 1% of sea fish are sold to the canning industry. Main problem during the catching, storing and marketing is inadequate cooling chain. For example, 97.34% of the fishing vessels (total: 17,696) do not have any deep freeze depots (SIS, 2004). This is an obstacle in the storage of fishery products for the future consumption.

Heavy bureaucracy in governmental procedures: The bureaucracy involved in licencing fish farms, especially in marine environments, is complicated, time-consuming, and suffers from a lack of technical knowledge and insufficient exchange of know-how and cooperation concerning new developments (Memis *et al.*, 2002).

Low technical level of fishery sector in Turkey, compared to the EU:

The fishing fleet in Turkey consists of about 9 thousand vessels in all-trawlers, trawler, carriers and various smaller craft. There has been some increase in size and engine capacity in the fleet over the last 15 years, but all vessels are involved in coastal or near-coastal fishing, and there exists no Turkish open sea fleet. Boats used for pelagic fishing are wooden and steel hulled, and up to 15 years in age. Larger boats may be 25-28 meters in Length, but 80% of all fishing boats are in the 5-10 m range. Most boats involved in pelagic fishing use ice in bar form to keep their catch fresh, though limited numbers have refrigerated holds. The usual ratio of ice to fish is one to four and the more valuable species are classified

and stored in ice before unloading. Trawling and purse seining are the chief methods used by the larger boats, while drift netting and long-lining, widely used elsewhere, are uncommon among Turkish fishermen.

Opportunities

Diet and fishery products: In the last quarter of 20th Century, in several countries (especially in North-Western Europe and North America), the health authorities have issued dietary advice, aimed primarily reducing obesity, health disease and cancer (Tracy, 1993). Fish is an important component in the human diet (Kent, 1997) due to low-energy, low-fat, low-cholesterol, high protein. It also contains vitamin A, D, E, K and groups of B and mineral elements (calcium, phosphor and iodine). Therefore, fishery products are suitable for diet menus. A Finnish study showed that fish diets reduce depression if consumed more than once a week. Norwegian studies show that people below 30 years of age eat less fish than their parents. This worries the health authorities, because two fish meals a week, as well as plenty of fruit and vegetables are a good investment in one's own health (Anonymous, 2001).

BSE disease: In 1995, Occurrence of BSE (Bovine Spongiform Encephalopathy) in the UK changed preferences of consumers from red meat to white meat (e.g. poultry meat and fishery products) in many countries including Turkey. Paquette (2002) stated that the BSE crisis had a highly emotional impact on European consumers and also a real impact on their food purchases. This event has produced different applications for aquaculture in individual locations. An apparent rejection exists by consumers in southern countries (France and Italy) but, on the contrary a more trusting attitude was found in some of the northern countries, notably Germany. In such a troubled yet varied time, it is all the more important to have a clear and accurate assessment of the consumption of aquaculture products within the market. Although there is no detailed scientific study on BSE and its effect on Turkish consumer preferences, the news on the newspapers have stated that preferences of consumers have shifted from red meat to fish and chicken meat after occurrence of BSE in the UK.

Changes in consumer preferences towards fast food: Increase in the number of working people in the cities, difficult working conditions, not having enough time for eating meal at home have changed the preference of people towards fast food in recent years. In this context, the number of fast food restaurants has increased especially in big cities. Since having lunch and dinner in

fast food shops is easy, and no need to spend much more time. Fish and chicken shops and restaurants have served fishery products and chicken meat as fast food at low prices, compared to red meat in cities.

Price parity between fishery products and other meats:

Fish and fish products compete with other meats. The competition especially depends on the relative prices of them. It can be argued that higher prices for fish will cause consumers to choose chicken or red meat. This could be true, but only to a limited extent, since (a) competition has always existed and yet the fluctuations of demand between fish and other protein sources have been marginal. (b) Consumers are usually not affected by the average price of products but, rather, on the price of the specific product they want. Within the fish market there is, and always will be, a large range of prices. Customers will always have a choice between high-priced items and low-priced items, and will not have to abandon the fish stalls altogether. (c) An enhanced demand for fish is expected as a consequence of the expected demographic growth, but there is no reason to believe that the public's consumption habits will change. The demand for fish is expected to grow proportionately to the growth of the population (Mires, 2001). According to a study on fish consumption, the price of fish has important role in the preferring of consumers this product (taste: 75.27%, high protein and vitamin: 53.76%, low-price: 43.01%, low-cholesterol: 18.28%, etc.) (Sayili *et al.*, 1999).

Increased investments in the context of GAP project: The main production area for inland fisheries is the Lake Van (East Anatolian Region, Turkey). When considered the South Eastern Anatolian Project (GAP) the potential of inland fisheries will be greatly enhanced. Within the framework of this project, a total of 220,000 hectares will be added to the inland freshwater capacity of Turkey (Celikkale *et al.*, 1999). This water, naturally, will change the figure (and also species) of freshwater fish production. In this context, freshwater fish and crustacea (crayfish, tilapia, wells, pike perch) are considered as potential species to be cultured in freshwater.

Increased number of aqua-feed industry: Although aqua-feed manufacture does not have a long history in Turkey, there are at present 9 feed manufacturing companies producing aqua feeds. Aqua-feed manufacturing industries and major feed lines produced can be summarised as Pinar Feed Industry and Marketing (for trout, sea bream, seabass and carp), Abalioglu Feed Industry (for trout, sea bream and sea bass, carp-mullet), Hakan Feed Industry (for trout, sea bass, sea bream and

carp-mullet), Yatagan Feed Industry (for trout, sea bass, sea bream and carp), Ozugur Feed Industry (for trout, sea bass, sea bream and carp), Korkuteli Feed Industry (for trout, sea bass, sea bream, carp, mullet), Bilecik Feed and Food Industry (for salmon, trout, sea bream, sea bass), Elazig Feed Industry (for trout, carp), Samsun Feed Industry (for trout, carp). The aqua feed manufacturing plants currently produce feeds ranging in size from micro-granulated/starter feeds for trout, sea bream and sea bass larva/fry to 2.2-6 mm size pellet fed for grow-out/adult fish. Pellet fish feeds are currently produced by conventional mechanical pressing technology, although some plants have plans to change their pellet technology to the use of extracted plants in short-run (Polat, 1999).

Providing financial and technical aid for fishery products: Between 1991 and 2000, US\$ 2.5 million in grant aid was provided by the Government of Japan, which was used through the World Bank. A number of studies were conducted by international consultants, including site selection for marine aquaculture farms, aquaculture legislation, stock assessment, inland waters surveys, a lagoons survey and a marketing study for current and future opportunities for both domestic and export markets (FAO, 2002). French Government provided US\$ 100,000 for lake fisheries studies. NATO has funded studies in the Black Sea to determine anchovy stocks. The Italian government provided funds to promote sea bass and sea bream culture. In addition to international funds, mainly Agricultural Bank, some private banks and Agricultural Credit Cooperatives have supplied credits to small, medium and big enterprises to make investments on fishery sector at low interest rates.

Threats

Over fishing and pollution in the Black Sea: Fisheries production has been shrinking year by year. The reason for the decrease is to be found in the much-reduced catches of anchovies and horse mackerel in the Black Sea. Little is known about the dynamics of either the anchovy or the horse mackerel shoals, so the reasons for the sharp decline have been difficult to determine, but it has been suggested that horse mackerel stocks have suffered from over fishing, with a fishing season lasting for nine months of the year. Other reasons given include the increasing number of jellyfish in the Black Sea, raising levels of pollution and the after effects of the nuclear disaster at Chernobyl (Muthoo and Onul, 1996). A Strategic Action plan has been signed among Black Sea Countries aiming at pollution prevention. In addition, studies are being conducted under co-ordination of Turkey, with a view to preserve and improve fishery in the Black Sea (KOSGEB, 2001).

Effects of aquaculture on tourism: As parallel to rapid development of aquaculture sector in Turkey some problems emerged between aquaculture and tourism sector since the areas of aquaculture production are suitable for the tourism sector and the current law on fishery products does not meet the requirements.

It is a fact that the relationship of Turkish people with water and water culture is complex. Though Turkish people have composed poems, songs, proverbs and so forth for the sea and have come up with idioms like. I'll even eat my father if he comes out of the sea. statistics illustrate that most of them neither like swimming in it nor supplement their tables with sea food. It's the best kind of love to love you from a distance is perhaps the sentence most eloquently elucidating Turkish people's feelings (Yildiz, 2003).

The Government of Turkey wishes to improve hygienic conditions in processing plants, raw material and the marketing chain. In this context, the government has started to take some measures to improve the quality of fish and fishery products, in line with the EU regulations (establishment of Fishery Products Hygiene and Control of Fish Disease, introducing a fishery products quality control manual, a sampling manual, a methods of analyses manual, procedures for farm and processing plant control, issuing a notice for health certificate preparation and control of wholesale markets, and a notice for sales points) (FAO, 2002). It is expected that all these attempts will develop fishery sector in Turkey in order to integrate and compete with fishery sector throughout the world.

As a conclusion, the fishery sector faces with a series of problems such as weak competition of fishery sector in Turkey with that of in the EU, low level of cooking and deep freezing facilities at marketing type, and so on. It is expected that the value added and social benefit of the fishery sector will increase as parallel to solution of the problems, making suitable investments and following accurate policies consisted with changes in world fishery sector. It can be said that the threatens for fishery sector can be an opportunity for the development of aquaculture in Turkey. Development of inland and marine aquaculture will base on policies directed to fishery sector, solution of conflicts between aquaculture and tourism sector, R and D activities related to productive and efficient use of inputs. In addition, financial aids to be obtained from national and international sources are needed. Producers and consumers should be organised. It should not forgotten that production of fishery products should be continued with environmentally friendly methods.

REFERENCES

- Alam, F. and K.J. Thomson, 2002. Current constraints and future possibilities for Bangladesh fisheries. *Food Policy*, 26: 297-313.
- Anonymous, 2001. Aquaculture in Norway. www.fiskeoppdrett.no/akvakultur/html/future.htm.
- Celikkale, M.S., E. Duzgunes and I. Okumus, 1999. Turkish Fishery Sector: Potential, Current Situation, Problems and Solution Recommendations. ITO Publication: 1999-2, Istanbul, Turkey.
- De Silva, S.S., 2003. Culture-based Fisheries: An under-utilised opportunity in aquaculture development. *Aquaculture*, 221: 221-243.
- FAO, 2002. Fishery Country Profile-Turkey (www.fao.org/fi/fcp/en/TUR/profile.htm).
- Henricks, M., 1999. Augmented Title: Strength-Weakness-Opportunity-Threat Analysis. *Entrepreneur*, 27: 72.
- Houben, G.K., K. Lenie and K. Vanhoof, 1999. A Knowledge-based SWOT analysis as an instrument for strategic planning in small and medium sized enterprises. *Decision Support Syst.*, 26: 125-135.
- Kent, G., 1997. Fisheries, food security and the Poor. *Food Policy*, 22: 393-404.
- KOSGEB, 2001. Overview by sectors. Euro Info C. Centre Newslett., No: 25, November.
- Memis, D., N. Demir, O.F. Eroldogan and S. Kucuk, 2002. Aquaculture in Turkey. *Israeli J. Aquacult.*, 54: 34-40.
- Mires, D., 2001. Forecasted supply and demand for comestible fish in Israel-2001-2005. *Israeli J. Aquacult.*, 53: 5-14.
- Muthoo, K.M. and T. Onul, 1996. Agriculture in Turkey. Agricultural Bank, Ankara, Turkey.
- Paquotte, P., 2002. The Share of Aquaculture in Total Seafood Supply. In *Seafood Market Studies for the Introduction of New Aquaculture Products*. Paquotte, P., C. Mariojouis and J. Young (Eds.), CIHEAM-IAMZ Cahiers Options Méditerranéennes. Zaragoza, Spain, Vol. 59.
- Polat, A., 1999. The Present Status of Fish Feed Manufacturing in Turkey. In *Feed Manufacturing in the Mediterranean Region: Recent Advances in Research and Technology*. Brufau, J. and A. Tacon (Eds.), CIHEAM-IAMZ, Zaragoza, pp: 141-143.
- Rad, F. and G. Koksall, 2000. An overview of aquaculture in Turkey: With Emphasis on Sea Bass and Sea Bream. *J. Aquacult. Econ. Manage.*, 4: 227-239.
- Sayili, M., K. Esengun, M. Kayim and H. Akca, 1999. Econometric analysis of factors affecting fish consumption in the central county of Tokat province. *J. Agric. Fac. Gaziosmanpasa Univ.*, 16: 9-28.
- SIS., 2004. Fishery Statistics 2002. Publication No. 2883, Ankara, Turkey.
- Tracy, M., 1993. Food and Agriculture in a Market Economy-an Introduction to Theory, Practice and Policy. APS Publications, Belgium.
- Ye, Y., 1999. Historical consumption and future demand for fish and fishery products: Exploratory calculations for the years 2015/2030, *FAO Fish., Circ.*, Rome, Italy, Vol. 946.
- Yildiz, A.E., 2003. To love you from a distance. *TURKISH TIME*, Publication of the Turkish Exporters Assembly, July 15-August 15, pp: 18-20.