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TURKEY'S AQUACULTURE SECTOR

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ABSTRACT

Aquaculture sector, which has an important place in Turkey's agriculture, has a great value in socio-economic field besides being a valuable source of food. Aquaculture products provide an imported added value to Turkish economy by activities such as providing raw material to the industry, employment creation, helping rural development and food production. Because of this structure, to answer the aquaculture products needs of the increasing population, aquaculture sector of Turkey and its production has made a fast development parallel to the increase in the world aquaculture production. The total aquaculture production of Turkey which was 79.031 t in 2003 has increased to 118.277 t in 2005 and to 158.729 t in 2009. 76.248 t (48%) of this production was made in inland waters and 82.481 t of it was made in marine farms. The most important species are rainbow trout (*Oncorhynchus mykiss*) with 52% in inland waters, sea bass (*Dicentrarchus labrax*) with 29% and gilt-head sea bream (*Sparus aurata*) with 18% in marine farms. Besides these species, mirror carp (*Cyprinus carpio*), rainbow trout in marine farms and mussel (*Mytilus* sp.) are produced in lower amounts. Depending on the 2009 data, there are 1.832 companies operating in the aquaculture sector of Turkey. 1.482 of these companies produce inland fishes with a capacity of 96.842 t and 350 of them produce marine fishes with a capacity of 114.420 t. 80 of the companies which produce marine fishes operate in terrestrial lands in soil pools. The aquaculture production is an important export item in Turkey. The income of exportation of Turkey's aquaculture sector is over 395 M USD in 2009. 47% of this exportation consists of fresh or chilled fish. As the most important species, sea bass and gilt-head sea bream are exported freshly and 90% of them are sold to European Union countries. When the potential of aquaculture in Turkey and the demand of world market; production of new species com into prominence. With this aim, by the collaboration of production of new species, which is supported and promoted by the government, new marketing strategies that will be planned due to the emerging developments in the area are very important in shaping the future of sector and Turkey.

Keywords: Aquaculture in Turkey, Aquaculture production, Aquaculture sector, Fish farms.

INTRODUCTION

Aquaculture has been designated as the fastest growing food sector in the world by the FAO. The total amount of fishery products that were obtained by aquaculture has arisen from 7.4 M ton in 1980 to 16.8 M ton in 1990, to 39 M ton in 2002 and to 50 M ton in 2007 in the world. Aquaculture meets approximately 30% of the world's fishery production and grows increasingly at a rate of 10% annually (Anon, 2007). China, India and Vietnam rank first in aquaculture in the world. Turkey ranks 26th in the world and they contribute to 0.27% of the world's total production. 2.6% of the world's total aquaculture products are produced by the European Union countries. In comparison to the European Union countries, Turkey ranks as the 5th in aquaculture production.

Aquaculture in Turkey was initiated by the production of rainbow trout and mirror carp in the inland waters. The first rainbow trout farm in the inland waters has been established in 1970. Sea bass and sea bream production enterprise has been put in operation in 1985. According to the data form 2009, a total of 1832 enterprises are present that are currently involved in aquaculture. The total aquaculture prodution in these enterprises has been eventuated as 158, 729 ton. The contribution of this value in the national economy is approximately 950 M TL (Anon, 2009).

In Turkey, trout culturing is conducted in the inland waters and in the seas, sea bass and sea bream culturing is conducted. In order to increase the diversity in aqua-culturing novel potential species are investigated and application studies are being conducted.

The fishery products aquaculture in Turkey has been undertaken in the present article and suggestions have been given regarding the culturing potential, its present condition and its goals towards the improvement of fishery product aquaculture as well as suggestions regarding its general policy.

RESULTS

The enterprises that are involved in inland water aqua-culturing have increased by 37% in 2009 in comparison to 2002 and the enterprises that are involved sea fish aqua-culturing have increased by 56%. Presently, trial and exercise studies for novel species are carried out in addition to rainbow trout and mirror carp culturing in inland waters and rainbow trout, sea bass and sea bream culturing in the seas. The number of aqua-culture enterprises has increased from 1 in 1971 to 1832 in 2009. Among these, 1482 enterprises are in action producing 96 842 ton / year of rainbow trout and mirror carp. A total of 350 sea culturing enterprises are present producing 114 420 ton / year of sea bream and sea bass. The number of enterprises that produce blue fin tuna is 9. 80 of the sea fish cultivating enterprises have clay pools in the land for production. One of the main features of Turkish aqua-culturing, specifically of inland water rainbow trout and mirror carp culturing is that it is comprised of many small scale enterprises with capacities of less than 10 ton/year (Yavuzcan *et al*., 2010). Aquaculture enterprises are present in 76 cities in Turkey (Doğan and Güven, 2005). 25% of the present enterprises are in operation in the Black Sea Region, whereas 18% are in the Mediterranean Region, 6% in the Marmara Region, 9% in the Central Anatolian Region, 31% in the Aegean Region, 10% in the Eastern Anatolian Region and 1% in the Southeastern Anatolian Region. 76 248 ton (48%) of the total production from aquacultures have been carried out in the inland waters and 82 481 ton (52%) of the production was carried out in sea enterprises. The most significant species that have been cultured are the rainbow trout (*Oncorhynchus mykiss*) covering 48% of total production in the inland waters and the sea bream (*Dicentrarchus labrax*) covering 29% of the production and the sea bass (*Sparus aurata*) constituting 18% of the production. In addition to these species, the mirror carp (*Cyprinus carpio*), with a 5%share in total production, the rainbow trout (*Oncorhynchus mykiss*) in seas and oysters from the shellfish family (*Mytilus* sp.) are also produced.

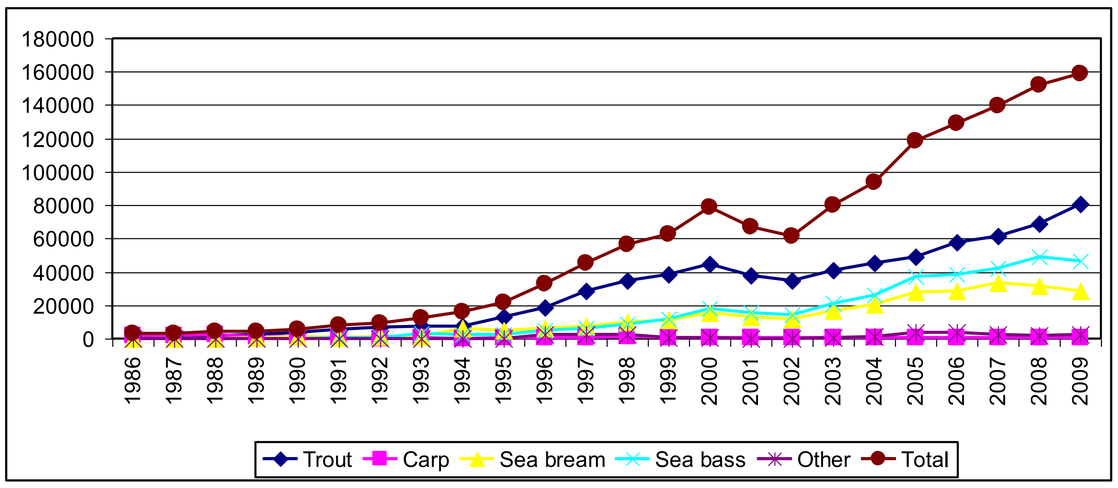

Figure 1. The development of fishery product aquaculture in Turkey (1986-2009) (Ton)

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Turkey possesses rich water resources owing to its position on Earth. As a country surrounded by sea in three directions with plentiful lakes, ponds, dam lakes, watercourses and springs, it has a large fishery products aquaculture potential with approximately 26 M hectare water surface area. With a total of 8333 km coast line including the islands, approximately 200 natural lakes with nearly 1 M hectare area, 200 000 km of watercourses, lagoons of approximately 70 000 hectare area and more than 3419 km2 dam lake area, Turkey possesses totaling up to 25 951 959 hectare fishery product aqua-culturing area (Anon, 2001; Çelikkale *et al*., 1999). Approximately 95% of the said area is constituted by the seas whereas 3% by the natural lakes and 2% by the dam lakes, watercourses, lagoons and ponds.

Table 1. The total amount of fishery products (in tons) obtained by catching and aquaculture in the inland waters and seas between 1986 and 2009 in Turkey and their relative changes (in %) **(**Anon, 1986-2009**)**

Years	Catch					Aquaculture		General Total (Tons)
	Sea Products (Tons)	%	Freshwater Products (Tons)	%	Total (Tons)	Quantity (Tons)	%	
1986	539 565	92,6	40 280	6,9	579 845	3 075	0,5	582 920
1987	582 853	92,8	41 760	6,7	624 613	3 300	0,5	627 913
1988	623 404	92,2	48 500	7,2	671 904	4 100	0,6	676 004
1989	409 929	89,7	42 833	9,4	452 762	4 354	1,0	457 116
1990	342 017	88,8	37 315	9,7	379 332	5 782	1,5	385 114
1991	317 425	87,0	39 401	10,8	356 826	7 835	2,1	364 661
1992	304 766	86,0	40 370	11,4	345 136	9 210	2,6	354 346
1993	502 031	90,3	41 573	7,5	543 604	12 438	2,2	556 042
1994	542 268	90,2	42 838	7,1	585 106	15 998	2,7	601 104
1995	582 610	89,7	44 983	6,9	627 593	21 607	3,3	649 200
1996	474 243	86,3	42 202	7,7	516 445	33 201	6,0	549 646
1997	404 350	80,8	50 460	10,1	454 810	45 450	9,1	500 260
1998	432 700	79,6	54 500	10,0	487 200	56 700	10,4	543 900
1999	523 634	82,2	50 190	7,9	573 824	63 000	9,9	636 824
2000	460 521	79,1	42 824	7,4	503 345	79 031	13,6	582 376
2001	484 410	81,4	43 323	7,3	527 733	67 244	11,3	594 977
2002	522 744	83,3	43 938	7,0	566 682	61 165	9,7	627 847
2003	463 074	78,8	44 698	7,6	507 772	79 943	13,6	587 715
2004	504 897	78,3	45 585	7,1	550 482	94 010	14,6	644 492
2005	380 381	69,8	46 115	8,5	426 496	118 277	21,7	544773
2006	488 966	73,9	44 082	6,7	533 048	128 943	19,5	661 991
2007	589 129	76,3	43 321	5,6	632 450	139 873	18,1	772 323
2008	453 113	70,1	41 011	6,3	494 124	152 186	23,5	646 310
2009	425 275	68,2	39 187	6,3	464 462	158 729	25,5	623 191

CONCLUSION

Increase in the structural organization of the sector and the inclusion of CMBs to play a significant part in the planning process through their acquisition of a healthy structure would provide an important contribution to the sustainable development.

The amount of naturally produced fishery products has decreased in years whereas the aquaculture production has increased over the years. The development of the production sector in Turkey designates an increase in the number of high technology aqua culture enterprises, an increase in the amount of both the production and the export and an increase in the amount of contribution to the national economy. Increased number of enterprises means an increased number of the population working in that sector. Considering the present aquaculture potential, more contribution will be provided for the national economy. In conclusion, it is economically and socially important for Turkey, which has rich sources of water for fishery product aquaculture production to efficiently realize its potential using new technologies.