

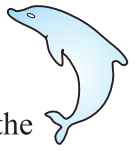
The effects of fishery policy on anchovy stocks and suggestions

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A look at the amount of aquacultural products in our country obtained through fishing reveals that more than half of it is made up of anchovy. Reconsidering the last 30 years, the fishing of anchovies makes up 59,16% of the sea fish obtained through fishing (Table 1).

Table 1. Fishing of sea fish and the amount of anchovy (tons) in Turkey between 1979 and 2008

Years	Sea fish	Anchovy	% (anchovy)
1979	324.912	139.515	42,94
1980	392.196	251.870	64,22
1981	434.244	273.020	62,87
1982	464.731	275.350	59,25
1983	511.526	300.372	58,72
1984	508.669	330.967	65,07
1985	519.911	284.576	54,74
1986	525.381	288.105	54,84
1987	562.697	310.298	55,14
1988	580.701	310.618	53,49
1989	361.770	98.620	27,26
1990	297.123	74.035	24,92
1991	290.046	90.637	31,25
1992	366.060	174.626	47,70
1993	453.123	227.130	50,13
1994	491.335	294.418	59,92
1995	557.138	387.574	69,57
1996	451.997	290.680	64,31
1997	382.065	241.000	63,08
1998	413.900	228.000	55,09
1999	510.000	350.000	68,63
2000	441.690	280.000	63,39
2001	465.180	320.000	68,79
2002	493.446	373.000	75,59
2003	416.126	295.000	70,89
2004	456.752	340.000	74,44
2005	334.248	138.569	41,46
2006	409.945	270.000	65,86
2007	518.201	385.000	74,30
2008	395.660	251.675	63,61
Average	442.373	261.695	59,16



It can be said that in spite of a lower fishing rate in comparison to the production rate of other countries, anchovy is the only species in Turkey of industrial value. Fluctuations within the

anchovy stocks strongly affect especially the Black Sea and have significant effects on the production quantity of aquaculture in our country.

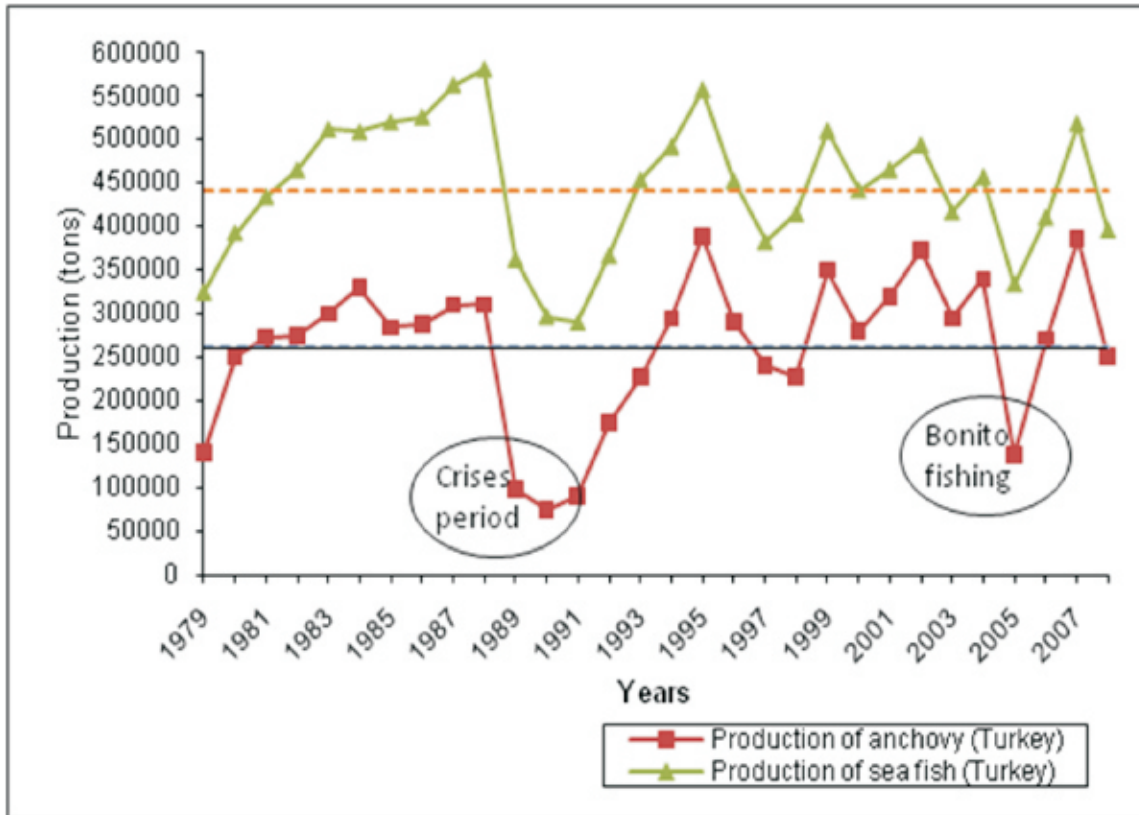


Figure 1. Sea fish and anchovy fishing amounts in Turkey between 1979 and 2008 (TUİK statistics)

The liberalisation of the economy in the 1980s and the effects of initiative policies on the world have also affected fishery. Due to the effect of incentives, the modernization of ship equipments, the introduction of modern fish finding appliances and the enlargement of ships, anchovy fishing has increased and reached about 300,000 tons between 1985 and 1988 (Table 1, Figure 1).

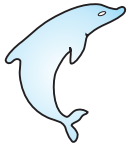
Parallel to the increase of the fishing amount, an increase can be stated within the handling and assessment industry, especially with regard to fish flour and fish oil factories.

Assuming that the production amount will increase continually, the number of factories reached over 20, but the high decrease of the fishing amount during the 1989-90 fishing season, which was caused by various factors, led to a big crisis in the sector. It can be observed that in this crisis the production amount diminished under 100,000 tons. The same situation can be stated for the fishing seasons of 1990-91 and

1991-92 (Table 1, Figure 1).

The lamentations of the private sector, which had made investments and taken out a loan, are getting worse. While the fishing amount is decreasing, the size prohibition of 9cm for anchovy is being downgraded to 7cm due to demands to pull it down and due to intense pressure.

The reasons for this rapid decline of the stocks are being questioned. As usual, the fishermen do not want to accept the reality of overfishing. There are those who relate the reasons to the Armenian earthquake. Others regard the extreme pollution of shallow waters especially in the Northeast of the Black Sea as the reason for this crisis. While some indicate that a comb type called *Mnemiopsis leidy*, which is assumed to be accidentally carried to the Northwest Atlantic, damages the spawn and larvae especially in pelagic habitats and is the reason for the collapse of the food system, others regard overfishing as the main factor.



In fact, a product decline of all species and of all fish species could be observed in Turkey during the anchovy crisis. It can be said that it is not sufficient to explain this decline only on the basis of various factors responsible for the changes in the ecosystem and that it is enforced by other factors of overfishing. The size distribution of economic fish species in the 1987-88 fishing season and the differences between the samplings in the following seasons can be shown as evidence for this. During this period, in which an extreme rejuvenation and shrinking of the stocks could be observed, the best proof of overfishing is the size distribution of the same species in trawler prohibited regions and in trawler open spaces.

Naturally, the dramatic decline of the fish stocks is followed by the collapse of the fish processing and assessment industry, which is linked to the former. In the following years, the closement of a lot of factories and their turn into ruins can be observed. The one in Fatsa, which belongs to the Meat and Fish Institutions and in front of which harbors and disembarkment units can be found, can be presented as the most striking example. This giant factory, which is also in possession of a laboratory, was closed and after long years of being in a ruined state, it was handed over to the Faculty for Sea Science founded in Fatsa.

After the fishing season in 1992-93, the recovery period in the stocks started. Together with the improvement in the stocks, everything continued from where it had finished. The purse seines are being enlarged. With the latest technological fish finding instruments the seine boats achieve an extraordinary fishing capacity. It is said that, today, a seine vessel has together with the fish finding instruments and other equipments costs of approximately 3 milyon TL. A seine vessel, whose company consists of 30-40 people according to its size, assures considerable economic contributions, even if only seasoned. But everything depends on the presence of fish in the sea and on satisfying prices of fish. Assumed

that there is no fuel support today, the fishermen know very well to which extent fishing with seine vessels will be negatively affected.

Then we have to ask this question: Putting aside unrecorded and even statistic data and assuming that the amount of fish is 300-400,000 tons, is the fisher content despite fuel support? If this is not the case and if it is not possible to top the maximum fishing amount, we have to make an assessment from the angle of fishery management. First of all, we have to change our approachment and go with the fishers for a situation assessment with public responsables. We have to change our attitude to always blame others for mistakes and not to accept our own responsibilities. The attitude of modern fishing countries towards problems and actions in matters of sustainable fishery management should be our ideals.

One of the basic problems is the fisher's approach to see more profit in more fishing. It is necessary that we understand that this is actually not true. Undoubtedly, another problem is the lack of solidarity and trust among the fishers who have common interests with regard to the protection of the stocks. Due to common behaviour and management both an extreme attrition of the stocks and an extreme decline of the prices can be prevented.

Actually, it can be said that our aquaculture products cannot be used to the full because of our consumption habits, inefficient management of the stocks and extreme fluctuations of fish prices. For example, the habit to consume fresh fish (almost no consumption out of the fishing season) leads to intense fishing during the fishing season and to an extreme decline of prices. Thus, fish is being sold below its real value and it can be observed that fish makes less profit in periods of intense fishing.

The present system of purse seine fishing at the Black Sea can be shortly summarized as follows:



1. The present fishery cooperation is not able to provide the cooperation between fishers (especially those of purse seine vessels).
 2. The relation between fishers and commissioners and its structure does not fit to the model of modern fishery organizations.
 3. There exists a lack of trust among purse seine fishermen. There is a prevailing sense of competition. Recently, there have been attempts to develop a sense of unity.
 4. Continual competition goes together with more investments and exaggerated equipments and results in extreme fishing potential which is higher than necessary.
 5. During the fishing season, fish is periodically being put on the market more than needed without considering price stability. Within the season, there are extreme fluctuations in prices according to the fishing amount.
 6. The habit to consume fresh fish results in its consumption during the fishing season. As the habit to consume processed fish has not been sufficiently developed, the production industry for human consumption cannot develop as wished and big economic losses are made because of wasting fish byproducts.
 7. On a national level, anchovy stocks are not sufficiently observed. From the angle of modern fishing management, observation equipments of ships which are needed for the prescribed observation projects and its administration have not been carried out so far because of high costs.
 8. Disorder within bureaucracy is not efficient with regard to research and management. Although an important development can be stated in matters of disembarkation sites, which are examined by the EU, there are still problems in its application. Therefore, the infrastructure is not suitable at the moment for future quota applications.
- if the price of the unions decreases, they store excessive products temporarily in cold storage depots, recess fishing and regularly introduce the product to the market.
3. the marketing of fish can be made by the union or the present commission structure can be reviewed.
 4. activities to provide the consumption of fish off season have to be supported. The transformation of fish for human consumption into fish flour and oil has to be restricted. The freezing and processing of cleaned fish has to be encouraged. By processing the waste of the production industries into fish flour, economic benefits will be provided and wastage of an important part of the product will be prevented.
 5. the researches and observation studies concerning anchovies, which are the most important species in the Mediterranean basin, are not sufficient. To provide this, we need a research ship which can work under inconvenient sea conditions in the Black Sea basin. Moreover, it is important to develop the infrastructure of our country, which is on its way to become a European Union member, so that it can participate in international projects. It is essential for the stock management to start studies similar to the stock examination and assessment studies in EU countries (acoustic survey studies, spawn-larvae surveys and the collection of data concerning fish brought to the shore and those of economic fishing efforts) and to assure their regular realization.
 6. we have to provide a structure which ensures a fast processing of the data obtained through research and in the region and allows fast decisions. It is foreseen that the establishment of the Fishery and Aquaculture General Directory, which resulted from the last ministry structuring, will have a very positive impact on this issue.

We are in need of a new fishery management if we want our present system to become more efficient. For that reason,

1. a purse seine fishermen association has to be founded. This union has to achieve agreement among the fishers and assure an efficient administration of the stocks by the fishers and other stakeholders.
2. In European countries it can be observed that

To shortly summarize, fishery research has to become a part of fishery management. The researches have to be carried out and opportunities have to be provided in such a way that they contribute to the solution of the basic problems of the system. Firstly, a short, medium, and long term plan has to be prepared for the fishery management and its regular realization has to be ensured.