

Full Length Research Paper

Development strategies of sea bass enterprises in Mediterranean region of Turkey

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Accepted 5 April, 2012

The study presents the current structure of Sea Bass (*Dicentrarchus Labrax*) in the Mediterranean Region of Turkey. Mugla, Antalya, Mersin, and Hatay provinces where cultured fish productions are intensive were chosen as research survey area. The data used in this research has been obtained by simple random sampling in 2009-2010 production terms by questionnaire performed in 72 Sea Bass enterprises. The structure of fish production was described based on the statistical data provided by Ministry of Agriculture and Rural Affairs (MARA) as well as Turkey Statistic Institute (TUIK). The data have been processed into the following indicators: The structure of Sea Bass enterprises such as 4Rs (Resources Reduce, Reused, and Recycling), productivity and profitability. Based on annual operation results, Gross Margin was calculated as \$83,194 for earthen pond enterprises and \$168,840 for cage enterprises. Net Income was \$59,528 for earthen pond enterprises and \$118,385 for cage enterprises. Agricultural Income was calculated \$79,888 for earthen pond enterprises and \$146,333 for cage enterprises. For earthen pond enterprises, financial profitability was 20.16% and economical profitability was 20.71%. For cage enterprises, financial profitability was 18.25% and economical profitability was 18.87%. The cost of Sea Bass and Sea Bream were calculated 4.91, 4.54, 4.98 and 4.87 \$/Kg for earthen pond and cage enterprises, respectively. As result of research, machine capital and feed consumption were calculated higher for cage enterprises where economic and financial profitability were lower. In this case, decreasing amount of machine capital and feed consumption will minimize the enterprise costs. The enterprises may maximize profitability with renting machine instead of investing, and optimizing amount of feed consumption.

Key words: Sea Bream (*Sparus auratus*), sea bass (*Dicentrarchus labrax*), Economics analyses, Turkey.

INTRODUCTION

Fishery is an important branch of agriculture in Turkey due to 3 seas around her. The fisheries sector (including catching, processing, aquaculture and support services) contributes approximately 0.4% of GDP and capture fisheries alone represents approximately 2.7% of the country's total agriculture production. Turkey is the 5th

largest aquaculture producer in Europe (including Norway) and 3rd largest excluding shellfish production after Norway and the UK. It is also the 2nd largest producer in Europe of sea-bass and sea-bream (after Greece) and rainbow trout (after Norway). The Turkish aquaculture sector has grown by 25% in production terms during last three years and is the fastest growing aquaculture sector in Europe. In 2005, 78% of total production (by volume) was from the catching sector and 22% was from aquaculture; by value the figures were 69

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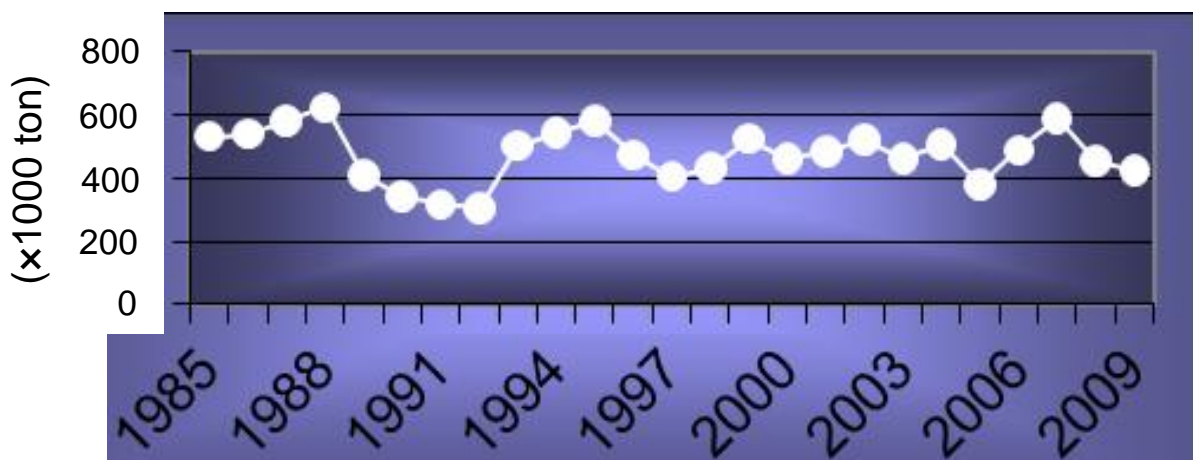


Figure 1. The production of marine products in Turkey (Anonymous, 2010a).

and 31% respectively (Anonymous, 2007).

The number of Turkey fish production has seriously increased by the cultured of fishes in earthen pond and cages in last decade. At present, the water products production is about 623191 ton and mainly raised in private subsistence households. Annual per capita consumption is about 7.6 kg in Turkey (Anonymous, 2010a). Mediterranean and Aegean Regions of Turkey contribute with more than 90% of cultured Sea Bass and Sea Bream productions in earthen pond enterprises and cage enterprises.

The objective of this survey research is to make comparative economic analysis of the cultured of Sea Bream (*Sparus auratus*) and Sea Bass (*Dicentrarchus labrax*) which became source of income for many farmers in Mediterranean and Aegean Region in earthen ponds and sea cages enterprises.

MATERIALS AND METHODS

The data used in research was obtained by simple random sampling in 2009-2010 production terms by questionnaire performed in 72 Sea Bass enterprises. The structure of fish production was described based on the statistical data provided by Ministry of Agriculture and Rural Affairs (MARA) as well as Turkey Statistic Institute (TUIK). In order to characterize the structure (technical, economical, and social) of Sea Bass and Sea Bream production, the following indicators were used: social indicators of the enterprises, yield, the average production of enterprises, resources consumption, number of Sea Bass Enterprises, and the economics results of production period per day. Revenues and costs mainly determine the economics of fishing operations. Revenues depend on species and quantities caught and prices obtained, which again depend on marketing channels, markets and seasonal fluctuations. The main cost factors are capital investment and operation costs, which can be divided into labour costs, running costs and vessel costs. The major components of labour costs are wages and other labour charges such as insurance and employer's

contributions to pension funds. Running costs are principally composed of fuel, lubricants, cost of selling fish, harbour dues, cost of ice, food and supplies for the crew. The major elements of vessel costs are vessel and gear repair and maintenance expenses and vessel insurance (Anonymous, 2007).

RESULTS AND DISCUSSION

The Sea Bass production has continuously increased from fishing in seas and internal water sources in Turkey. Also, cultured production of Sea Bass (79031 million ton in 2000) has been increased 159728 million ton in 2009.

The production of water products in Turkey as marine fishery (about 60% of the total) is currently about 400 million tons (Figure 1). The main product of marine (54%) is Anchovy (*Engraulis engrasicholus*) fish in Turkey. The economic value of production was decreased by 22% due to decreasing of Anchovy prices with respect of abundant production. Brisling (*S. sprattus*) 8%, Pilchard (*Etrumeus teres*) 5%, Horse mackerel (*Trachurus tarchurus*) and Whiting (*Merlangius merlangus*) 3% are the others main products of marine in Turkey.

The production of water products in internal water of Turkey (aquaculture) is currently about 50 million tons. The production has been stable in last decade. The main product of aquaculture (31%) is Carp (*Cyprinus carpio*) fish in Turkey.

Van pearl greymollet (*Chalcarburnus tarichi*) (30%), Silver fish (*Atherina boyeri*) (17%), and Snail production (6%) are the others main products of internal water of Turkey.

Cultured of sea fish production in Turkey was just 0.5% of total water products, where it has been increased by 17 times nowadays. The culture of Sea Bream (*S. auratus*) and Sea Bass (*Dicentrarchus labrax*) are main products. The current annual production for culture of sea

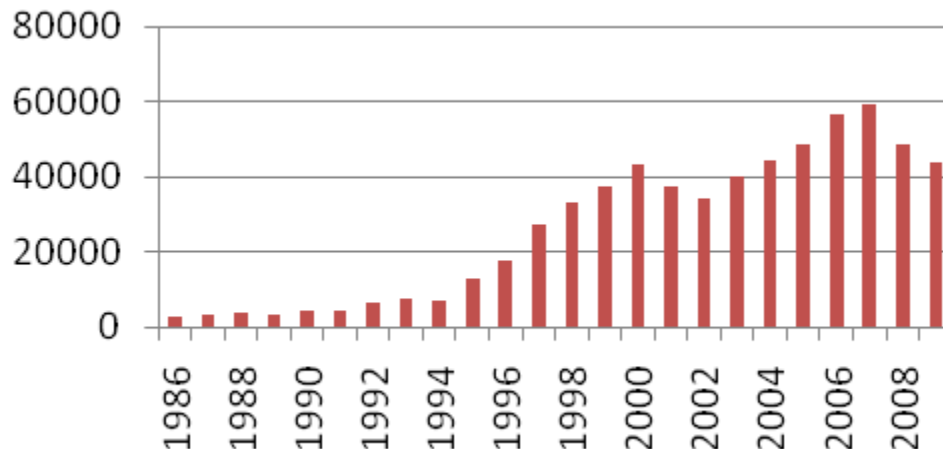


Figure 2. The annual cultured of internal water fish production, ton (Anonymous, 2010b).

products is about 139873 million tons where was 61165 million tons in 2002. The annual cultured of internal water fish production is currently about 59033 million tons in Turkey. It was 3040 million ton in 1986 (Figure 2).

Turkey produces approximately 0.6% of total world fish production (Anonymous, 2010b). The result of this study, the average labour use was 2.63 Man Power Units. The average investments were \$652,315 and \$298,827 for cage enterprises and earthen pond enterprises respectively. Defining size and scope of the fisheries were determinate 100 ton per year based on Ministry of Agriculture and Rural Affairs supports. Based on annual operation results of the enterprises, Gross return was calculated \$83,194 for earthen pond enterprises and 168840\$ for cage enterprises. Net return was \$59,528 for earthen pond enterprises and 118385\$ for cage enterprises. Agricultural income has been calculated 79888\$ for earthen pond enterprises and 146333\$ for cage enterprises. For earthen pond enterprises, financial profitability was 20.16% and economical profitability was 20.71%. For cage enterprises, financial profitability was 18.25% and economical profitability was 18.87%. The cost of Sea Bass and Sea Bream were calculated 4.91, 4.54, 4.98 and 4.87 \$/Kg for earthen pond and cage enterprises respectively.

In Mediterranean Region of Turkey, Sea Bass production gives an important contribution to culture of sea fish production in earthen pond and cages due to suitable sea and field conditions. The production potential is idle and producers of earthen pond enterprises are not organized. Strong academic infrastructure of Mediterranean Water Products Research, Production and Training Institute (AKSAM), good inland resources, and relationship with dynamic private enterprises are strengthening of the fishery sector.

The lack of knowledgeable advisory support for

enterprises, lack of market organization, and lack of management within earthen pond enterprises are weakness of the fishery sector. The financial supports of Ministry of Agriculture and Rural Affairs (MARA) in Turkey and The European Union funds, Central Finance and Contracts Unit in Turkey Civil Society Dialogue I, II, ...; Fisheries and Agriculture Grant Scheme Reference: CFCU/TR0703.01.-01,02.../FA, big consumption potential of fisheries market in Turkey are opportunities for the fishery sector.

Depending on fast developing new technology is the main threat for the fishery sector since capacity development or using new technology is necessary in order to increase sustainability for the enterprises.

Fish marketing chains are mainly from Vessels through local Community Agent, hawkers/wholesalers/retailers and consumers. Running cost of the fishes are fuels, ice, boxes, transport, maintenance (vessel), gear repair, vehicle repair, food, clothes, wages, and crew share. Depreciation is fishing gear, vessels, and equipment.

High profitability of the sector, low direct investment cost, fast development of the sector, sharing of resources, large network of research institution, and government support of the investment are strength where high competitiveness, lack of the management capacity, problems gaining, increased use of technology, lack of co-operation of research are threats.

Conclusions

The number of Sea Bass Enterprises has continuously increased in earthen pond and cages in last decade with a positive impact of MARA research branch Mediterranean Water Products Research, Production and Training Institute (AKSAM) in Mediterranean part of

Turkey. The fishery for Sea Bass (*D. labrax*) and Sea Bream (*S. auratus*) around the Mediterranean part of Turkey is a profitable operation targeting a high-value, slow-growing species.

Mediterranean Region of Turkey is suitable for culture of sea fish production due to its water quality and climate conditions. The important potential of the area is idle. The management objectives of enterprises have focused heavily on economical sustainability where there is lack of biological/ecological sustainability. The enterprises primary objectives are not ecosystem conservation. No consideration has yet been given to the long-term fishery in the survey area. On the other hand, current economic and biological performance criteria were estimated well for the enterprises.

The analyses of the fishery sector in the study area do provide both enterprises type profitable. The net return was higher for cage enterprises due to amount of investment. The key performance indicator was determinate as average investment. The investment on cage enterprises and earthen pond enterprises return similar profit. In this case, earthen pond enterprises recommended since cage enterprises have pollution impact in international water sources. Ecological and economical points have proper to earthen pond enterprises. Cage enterprises were also required professional graduated employee for good starting point for the business.

Creating National and International research collaboration within Research Institutes, Non Government Organization (NGOs), and Private Fishery Enterprises is emergency Need Assessment of the fishery sector development in Turkey. The collaboration on Research & Development within fishery stakeholders based on 3 dimensionally way may create innovation of technology development where the problem of fishery sector solve with the result of equipment cost decreasing.

Access to European structural funding programmes to support industry development Agriculture and Fishery; value-adding in the sector; establishment of the registry; and the expansion of the sector leads jobs and growth opportunities the region. Natural resources of the open sea fishery must be in accordance with the sustainable usage of resources. The resource usage must be based on information, producer organisation must be established for civil society dialogues, and national marketing must be supported by the government. Also, environmental procedures in the sector must be consistent with EU practices where environmental, economic and social aspects have been taken into consideration.

The steps of development strategies were determined based on five different EU programmes and instruments (PHARE, ISPA, SAPARD and Turkey pre-accession instruments, as well as the CARDS instrument) as follows;

- i. Creating Civil Society Dialogue within Universities, Government and Private Sector (including Non-Government Organization)
- ii. Training of the stakeholders
- iii. Technical assistance for the stakeholders
- iv. Improvement of infrastructure
- v. Supporting of producers groups
- vi. Value adding by processing and marketing of the products
- vii. Improving environmental quality
- viii. Developing diversification of economic activities
- ix. Building institutional and regional cross border cooperation
- x. Integrating fishery with regional and rural development plans

Some related activities of the fishery such as extension, training, policy, organizations (union, agency, cooperatives), programmes, projects, determination of quality standards, and research activities will create productivity and quality where market structure significant

ACKNOWLEDGEMENTS

This research work was carried out at Selcuk University, The Graduate School of Natural and Applied Science, The degree of Master of Science/ Agricultural Economics.

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