



**PROFILE OF FISHERY COOPERATIVES AND ESTIMATION
OF SOCIO-ECONOMIC INDICATORS IN MARINE SMALL-
SCALE FISHERIES; CASE STUDIES IN TURKEY**

VAHDET ÜNAL

**TESIS PRESENTADA Y DEFENDIDA
PUBLICAMENTE PARA LA OBTENCION
DEL TITULO DE
MASTER OF SCIENCE EN
ECONOMÍA Y GESTIÓN DE LA ACTIVIDAD PESQUERA**

Barcelona
3 de Abril de 2006

PROFILE OF FISHERY COOPERATIVES AND ESTIMATION OF SOCIO-ECONOMIC INDICATORS IN MARINE SMALL-SCALE FISHERIES; CASE STUDIES IN TURKEY

VAHDET ÜNAL

Trabajo realizado en la Facultad de Ciencias Económicas y Empresariales de la Universidad de Barcelona, España, y en Ege University, Faculty of Fisheries, Turquía, bajo la dirección del Dr. Ramon FRANQUESA y del Dr. Hüseyin OZBILGIN.

Presentado como requisito parcial para la obtención del Diploma Master of Science en Economía y Gestión de la Actividad Pesquera otorgado por la Universidad de Barcelona a través de Facultad de Ciencias Económicas y Empresariales y el Centro Internacional de Altos Estudios Agronómicos Mediterráneos (CIHEAM) a través del Instituto Agronómico Mediterráneo de Zaragoza (IAMZ).

Esta Tesis fue defendida el día 3 de Abril de 2006 ante un Tribunal Formado por

Prof. Dr. Irene MAESTRO,
Prof. Dr. Bernardo BASURCO,
Prof. Dr. Antonio PINILLA,
Prof. Dr. Joan L. ALEGRET,

Acknowledgement

First of all, I wish to thank Professor Dr. Ramón FRANQUESA, my supervisor and Director of the Master for his invaluable contributions, comments and help.

I would like to give particular thanks to Ass. Prof. Dr. Hüseyin OZBILGIN, my dear friend and co-supervisor of the thesis from Ege University-Turkey, for his useful comments, expert editing and motivation particularly during the stressful-up period of the thesis and also Jordi GUILLEN from GEM-UB for his all kinds of help and support.

I gratefully thank my defense committee for their critiques, contributions and comments.

I express my sincere thanks to International Centre for the Advanced Mediterranean Agronomic Studies (CIHEAM), Mediterranean Agronomic Institute of Zaragoza (IAMZ) and University of Barcelona-Gabinete de Economia del Mar (GEM-UB) for financial support and as well as flawless master programme. And thanks also my institution, Ege University-Faculty of Fisheries, especially my own department for their permission and support. This thesis would not have been possible without the support of these three institutions.

There are so many fishermen to thank as well. I am grateful to all of them but I owe great thanks to Can GORGUN from Akyaka-Gokova and Yasar BALTA from Foca. I owe great thanks to two scientists from Foca as well; Yalcin SAVAS and Harun GUCLUSOY.

I am also grateful to Yassine ZAHRI, Abel Mourelo LÓPEZ, Albert Maria SOLIVA, Ester Boy CARMONA, Essaid ZEGHDOUDI, Ali ESSAFI, and Orhan ERDEM for their friendship and all kinds of assistances.

Last but not least, I gratefully thank my family especially my daughter Doga Sade ÜNAL, whose love, encouragement, patience and support have been of great help.

CONTENTS

1. Introduction.....	0
2. Objectives	5
3. Material and methods.....	6
3.1. Calculation of socio-economic indicators	9
3.1.1. National Indicators	9
3.1.2. Local Indicators	11
3.2. Calculation of costs and economic performance.....	12
3.2.1. Calculation of costs.....	12
3.2.2. Calculation of economic and financial performance	13
3.3. Success and failure of fishing cooperatives.....	14
4. Results	15
4.1. Structural, technical and social characteristics	15
4.1.1 Country profile and fishery structure: an overview	15
4.1.2. Fishery structure in the study area	21
4.1.2.1. Vessel characteristics in the study areas	23
4.1.2.2. Socio-demographic characteristics of fishermen in the study areas	24
4.2. Socio-economic indicators	27
4.2.1. National level indicators	27
4.2.2. Local level indicators.....	28
4.3. Economic characteristics and viability of small-scale fishing vessels	34
4.3.1. Cost structure, daily share income and fishing efforts.....	34
4.3.2. Market structure	37
4.3.3. Economic and financial performance of fishing fleet.....	39
4.4. Fisherman organizations: Co-operatives.....	41
4.4.1. History and present status of fishery cooperatives	41
4.4.2. Characteristics and problems of selected fishery cooperatives	44
4.4.3. Success/failure of fishery cooperatives.....	49
5. Discussion	53
6. Conclusion	60
7. References.....	62
Appendix.....	69

List of Figures

Figure 1: The study area, (1) Karaburun (2) Foca, (3) Mordogan, (4) Akyaka, (5) Akcapinar, and (6) Marmaris.....	6
Figure 2: Total number of cooperative members, active members and interviewed members.....	9
Figure 3: Institutional structure of the fisheries sector in Turkey (OECD, 2005).....	19
Figure 4: Comparison of mean length and engine power of small-scale fishing vessels in the study area.	24
Figure 5: Comparison of mean age of small-scale fishing vessels in the study area.....	24
Figure 6: Comparison of mean age and experience of fishermen in the study area.	26
Figure 7: Comparison of mean household population of fishermen in the study area.	26
Figure 8: Comparison of percentages of fishermen who declared fishery as his only income source.	27
Figure 9: Comparison of percentages of fishermen having social security.....	27
Figure 10: Comparison of vessel physical productivity of fishing districts.	30
Figure 11: Comparison of capacity physical productivity of fishing districts.....	30
Figure 12: Comparison of power physical productivity of fishing districts.	31
Figure 13: Comparison of per vessel day physical productivity of fishing districts.	31
Figure 14: Comparison of man physical productivity of fishing districts.	31
Figure 15: Comparison of landing price of fishing districts.....	32
Figure 16: Comparison of man productivity of fishing districts.	32
Figure 17: Comparison of invested capital of fishing districts.....	32
Figure 18: Comparison of capacity productivity of fishing districts.....	33
Figure 19: Comparison of vessel productivity of fishing districts.....	33
Figure 20: Comparison of power productivity of fishing districts.	33
Figure 21: Comparison of per vessel day productivity of fishing districts.....	34
Figure 22: Total costs of small-scale fishing vessels in the study areas.....	35
Figure 23: Comparison of running cost and share income in the study areas.	37
Figure 24: Comparison of number of days at the sea and fishing days with no catch.	37
Figure 25: Marketing channel of small-scale fishery in the south Aegean coast.	38
Figure 26: Comparison of net cash flow of small-scale fishing vessels.....	40
Figure 27: Comparison of economic/financial performance of small-scale fishing vessels in selected fishing districts.....	41
Figure 28: Location of central Aegean coast cooperatives and fishing areas.....	45
Figure 29: Location of south Aegean cooperatives and fishing areas.....	46

List of Tables

Table I: Member structure of the cooperatives and number of fishermen interviewed.....	8
Table II: National level indicators and their formulas (Franquesa et al., 2005).....	10
Table III: Local level indicators and their formulas (Franquesa et al., 2005).....	12
Table IV: A summary of economic profile of Turkey in 2002 (Anon., 2005).....	15
Table V: National fisheries background data of Turkey in 2002 (Anon., 2004).....	15
Table VI: Basic data on the fisheries sector in Turkey (1999-2002) (Anon., 2004).....	16
Table VII: Length, power and age of the vessels in the study area.....	23
Table VIII: Socio-demographic characteristics of small-scale fishermen.....	25
Table IX: National Indicators of Turkey, 2002.....	28
Table X: Socio-economic indicators of small-scale fishery in six selected fishing cooperatives in Turkey.....	29
Table XI: Total costs components of small scale fishing vessels.....	34
Table XII: Some operational characteristics of small-scale fishing vessels.....	36
Table XIII: Gross and net cash flow of small-scale fishing vessels (in US\$).....	39
Table XIV: Economic/financial results of small-scale fishing vessels.....	40
Table XV: Characteristics of fishery cooperatives in the study area.....	48
Table XVI: Main problems of the selected fishery cooperatives in Turkey.....	49
Table XVII: Success/failure indicators (quantitative) of cooperatives.....	50
Table XVIII: Success/failure indicators (qualitative) of cooperatives.....	51
Table XIX: The effectiveness of cooperatives from members' point of view.....	51
Table XX: Cooperatives members' opinion about fishery.....	52

Resumen

Este estudio evalúa el estado de las pesquerías de artes menores en Turquía, sus operaciones de pesca y sus cooperativas mediante el uso de indicadores socio-económicos y evaluando sus resultados para el periodo 2002-2003. Este trabajo ha sido efectuado en estrecha cooperación con los pescadores y con el equipo directivo de cada una de las cooperativas. Durante el trabajo de campo han sido entrevistados en seis distritos de pesca distintos, 127 pescadores de artes menores todos ellos propietarios y miembros de una cooperativas.

Los objetivos generales de este estudio son la evaluación de la viabilidad económica de la actividad pesquera mediante la estimación de algunos indicadores socio-económicos y de los resultados económicos. Se ha dirigido también determinar los éxitos, problemas y obstáculos de las cooperativas pesqueras en la consecución de sus objetivos: Finalmente se ha evaluado la satisfacción de los pescadores y algunos otros temas con el fin de atraer la atención de las autoridades que gestionan la pesca.

Según los resultados socio demográficos, la edad media de los pescadores es de 46.7. Muchos de ellos (90%) están casados y el tamaño medio del núcleo familiar es de 4.6 personas. Sólo el 5 por ciento de los pescadores tienen menos de 30 años, lo que indica que las generaciones jóvenes no muestran interés en la pesca con artes menores.

Los resultados económicos del estudio muestran que el 53 por ciento de las embarcaciones de la pesca de artes menores tienen un beneficio neto positivo y recuperan completamente sus costes totales, sin pérdidas. Pero cuando se considera una tasa de rendimiento económico superior al 10 por ciento, sólo el 41 por ciento de las embarcaciones de pesca de artes menores muestran buenos resultados.

En lo que concierne a las cooperativas pesqueras, se encontró que algunas muestran puntos fuertes y son en parte exitosas pero funcionan por debajo de su potencial debido a diversos factores internos (falta de solidaridad, falta de gestión cualificada) y externos (poco apoyo legislativo del gobierno, el actual sistema de tasas, la falta de formación). Las cooperativas por su contribución a la sociedad, y el soporte que prestan a las su autoridades que gestionan la pesca, juegan un papel importante en las pesquerías artesanales en Turquía. Por consiguiente, parece adecuado dedicarles una mayor atención y apoyo para mejorar su rendimiento.

Palabras clave: Socio-economía; Cooperativas pesqueras, Pesca artesanal; Viabilidad; Gestión de pesca; Éxito de las cooperativas; Mar Egeo.

Summary

The study evaluates the state of small-scale fishers, fishing operations, and cooperatives in terms of socio-economic indicators and success performance during 2002-2003 fishing season in six selected fishing area in Turkey. The work was carried out in close co-operation with fishers and management board of each cooperative. During the field study, 127 fishers, all of whom were skipper owner and cooperative members, were interviewed in six different fishing districts.

The general aims of the study were to state economic viability of the fishing activity through the estimation of some socio-economic indicators and economic performance. It was also aimed to determine success, problems and the obstacles of the fishing cooperatives with regard to objectives of cooperatives, fishermen's satisfaction and several other criterias to attract attention of central fishery management authority.

According to the socio-demographic results, average age of the fishers was 46.7. Most of the fishermen (90 %) have been married and their average household size was 4.6 people. The fact that only 5 percent of the fishermen were younger than 30 years old, indicated that young generation did not show interest in small scale fishery.

Economic results of the study showed that 53 percent of small-scale fishing boats have a positive net profit and fully recover their costs, with no losses. However, when considering an economic performance ratio of more than 10 percent could be accepted as good, only 41 percent of small-scale fishing vessels show good results.

Regarding fishery cooperatives it was found that some cooperatives showed particular strengths and were partly successful but performed less than their potential due to many internal (lack of solidarity, lack of qualified business management), and external success factors (weak legislative support by government, present tax system, lack of training). Due to their contribution to the society, and function in assisting management bodies, cooperatives play a significant role in Turkish small scale fisheries. Therefore, they deserve more attention and encouragement to show better performance.

Keywords: Socioeconomics; Fishery cooperatives; Artisanal fisheries; Viability; Fisheries management; Cooperative success; Aegean Sea

Résumé

Cette étude évalue la situation des pêcheurs artisanaux, des activités de pêche et des coopératives, moyennant des indicateurs socio-économiques y les résultats de la saison de pêche 2002-2003, au niveau de six zones de pêche en Turquie. Ce travail a été entrepris en étroite coopération avec les pêcheurs et les gestionnaires des coopératives. Durant les enquêtes de terrain, 127 pêcheurs artisanaux, tous propriétaires d'embarcations et membres des coopératives, ont été interviewés au niveau de cette zone d'étude.

Les principaux objectifs de cette étude, portent sur l'évaluation de la viabilité économique de l'activité de pêche, à travers l'estimation de certains indicateurs socio-économiques et l'analyse des résultats économiques obtenus. Il a été objet aussi, d'une part, de l'évaluation des niveaux de succès, des problèmes et des obstacles, auxquels sont confrontées les coopératives, en tenant compte de leurs objectifs, et d'autres part, de satisfaire les pêcheurs et attirer l'attention des autorités compétentes.

Les résultats socio démographiques montrent que l'âge moyen des pêcheurs est de 46.7 ans. La majorité d'entre eux (90%) sont mariés et ont des ménages d'une taille moyenne de 4.6 personnes. Le fait que seul 5 pour cent des pêcheurs ont moins de 30 ans, indique que la jeune génération montre très peu d'intérêt pour la pêche artisanale.

Les résultats économiques de cette étude montrent que 53 pour cent des embarcations de pêche artisanale, ont un profit net positif et couvrent alors complètement leurs coûts totaux, sans pertes. Mais, lorsqu'on considère qu'un ratio de performance économique supérieur à 10 pour cent, comme étant bon résultat, seuls 40 pour cent des embarcations de pêche artisanale montrent des résultats positifs.

Concernant les coopératives de pêche, il est à noter que certaines d'entre elles montrent plusieurs points forts et sont quasiment rentables. Toutefois, elles opèrent en dessous de leur potentiel, suite à plusieurs facteurs internes (manque de solidarité et d'une gestion qualifiée) et externes (insuffisant appui législatif du gouvernement, le système actuel des taxes et le manque de formation).

Vu leur contribution sociale, et leur assistance aux autorités gestionnaires, les coopératives jouent un rôle important dans le secteur de la pêche artisanale, en Turquie. Ils méritent, par conséquent, plus d'attentions et d'encouragements pour améliorer leur rendement.

Les mots clés: Socio-économie; Coopératives de pêche; Pêche artisanale; Viabilité; Aménagement de pêche; Succès de la coopérative; Mer Égée.

1. Introduction

Fishing has always been an important activity in coastal states due to economic, geographic, traditional, and cultural factors. Therefore, in Turkey, as in many other countries, the most intensive users of coastal zone have been fishermen.

Today, small-scale fisheries employ 50 million (99%) of the world's 51 million fishers, practically all of whom are from developing countries (Berkes et al., 2001; FAO, 1999; Santen, 2003), and together, they produce 40 percent of the world's annual marine and inland fish catch (FAO, 2001 estimation stated in Whitmarsh et al., 2003), supplying most of the fish consumed in the developing world. Industrial fisheries are seen to be the most productive on a world-wide scale, but FAO (1995) and Freire and Allut (2000) stated that the small-scale coastal fisheries have a much greater social significance than industrial fishery. However, yet small-scale fisheries have been systematically ignored and marginalized over the years, in both developing and developed countries (Berkes, 2001), they have not received more than scant attention during the past several decades of national and international development (Panayotou, 1982). In most societies, small-scale fishers suffer the greatest deprivations as they have low social status, low incomes, poor living conditions and little political influence (Pomeroy and Williams, 1994). Neither decision makers nor fisheries scientists show sufficient attention to small-scale fishery. Therefore, most of the small-scale fishermen are in crisis in the world. Berkes et al. (2001) reported that the majority of small-scale fisheries have not been well managed. It is now almost universally accepted, for example, that most of coastal fisheries in Southeast Asia are overfished. With excess capacity, both labour and capital, existing in most coastal small-scale fisheries, most existing fisheries management arrangements have failed to successfully coordinate and restrain fishing capacity and effort in small-scale fisheries and to manage conflict (Berkes et al., 2001).

FAO (2002) reports that 5.8 million small-scale fishers earn less than US\$ 1 a day and states that certainly, the continued levels of poverty in small-scale fishing communities, and in the world as a whole, require that all those concerned take a fresh look at the problem.

In many member countries of Organisation for Economic Co-operation and Development (OECD), marine resources are also over-exploited. This is due mainly to management policies that have failed to maintain harvests at sustainable level (OECD, 1997). Although fishing in the Mediterranean has not undergone any dramatic event, some overfishing symptoms are evident for the most important commercial species (Leonart et al., 1999). Overfishing, overcapitalization, huge amount of discarded fish damage fish stocks and give negative effect on efficient use of labour and capital in fishery. Failure of fishermen organizations especially in the form of fishery cooperatives play important role in this crisis or in other words, successfully managed fishery cooperatives have great potential to cope with the crisis which occurs in fishery. According to Baticados et al. (1998), fishery cooperatives can co-manage coastal fishery resources, help improve the living conditions of small-scale fishers, and slow down the rapid depletion of these resources. Pollnac (1988) reviewed that over the last several decades, there has been a growing awareness of the important role fishermen's organizations, especially cooperatives, can play in the development process. Many observers have noted that fishermen's organizations formed on the basis of local initiative—needs felt by the fishermen themselves—are more likely to succeed than those imposed from outside the community. Successful cooperatives generated by the fishermen themselves can be found in Belize (Gibson, 1978; FAO, 1971), Italy (Cattarinussi, 1973; Bonetti, 1976), among a Chinese minority in Malaysia (Narkswasdi, 1976), in the Philippines (Castillo, 1980), Grenada (Epple, 1979), Canada (FAO, 1971), and the United States (Poggie and Gersuny, 1974). Fishermen's cooperatives in Belize are so successful that Gibson (1978) reported

that Food and Agricultural Organization (FAO) chose Belize as a potential site for training others in the organization of fisheries cooperatives. Santen (2003) mentioned about well managed and successful small-scale fishery in several countries such as Japan, Philippines and Maldives, and also Berkes (1986) focused on small-scale fisheries practiced under five fishery cooperatives, revealed their conflicts with the large scale fisheries, their success and failure in Turkey and found out that three of the five case studies had successful small-scale fishery. Nevertheless, cooperative organizations and small-scale fisheries operated under fishery cooperatives are usually not managed successfully in many countries including Turkey, and as stated by Pollnac (1988) have been characterized more by failure than success.

Fishermen are usually organized under fishery cooperatives in Turkey and the numbers of fishery cooperatives have been increasing day by day. These cooperatives usually can not be run according to their existing objectives and are not managed professionally. In Turkey, since 1940s, fishery cooperatives have not reached desired level due to unfair competition, insufficient aids and subsidies, lack of solidarity and education, lack of leadership, wrong identification and planning, unqualified and uninspired business management. Kocel (1971) mentioned about similar concepts 35 years ago and expressed that cooperatives could be effective tool to solve problems of small-scale fishery but they have not been properly organized yet in Turkey. There are very limited numbers of cooperatives which distribute patronage refund, provide clear benefits to the members. Only few supply cooperatives exist that supplying fishing gear material and credit. As Knudsen (2001) and Ünal (2004a) stated that these are fishery cooperatives nonfunctional, only come together once in a year for general assembly and have nothing as an activity except their names.

Presently, very limited numbers of fishery cooperatives are able to meet expectations of their members. Lack of efficient fishermen organizations is still considerable problem of Turkish fishery. However, despite their limited success rate, fishermen's cooperatives seem to be the most appropriate organizational form to overcome most of the problems in fishery (but not the main problem of fishery -.According to Berkes (1986), the Bay of Izmir example further shows that the presence of cooperatives is not a sufficient condition for successful fisheries. There are many cooperatives and some of them probably quite effective as marketing cooperatives and in promoting the best interest of their members. However, the common problem in the Bay of Izmir is beyond their power). Historical background of the fishery cooperatives in Turkey are described in section 4.4.1.

T.H. Huxley addressed at the London Fisheries Exhibition in 1883 that the cod fishery, the herring fishery, pilchard fishery, the mackerel fishery, and probably all the great sea fisheries are inexhaustible and any attempt to regulate these fisheries seems consequently from the nature of the case, to be useless (King, 1995). The point that reached after one century is awful. Because fishery is dynamic, complex and multidisciplinary subject and unregulated fishery can not be sustainable. Due to its nature, fishery needs to be managed, and fisheries management, which has biological, economic, technological, political, cultural and sociological dimensions (Berkes et al., 2001), is not an easy task. However, after a few years of Huxley's explanation first signs of overfishing were appeared in 1890, through decreasing catch per unit of effort of cod fish (*Gadus morhua*) in North Sea (Crean and Symes, 1996). Following years, due to complex nature and multidisciplinary structure of fishery, wrong or incomplete fishery management policies, many countries, even developed countries, have failed to manage their fishery resources. FAO (1995) reported that 69 per cent of the world's marine fish stocks are either fully to heavily exploited, overexploited or depleted. According to Brown and Kane (1997), in Canada, where fishing industry has 1.5 million tonnes total landing and 3.1

billion US\$ landing value, huge decreasing of catch amount was observed due to collaps of cod and hake (*Merluccius merluccius*) stocks in Nova Scotia. Furthermore, unemployment rate has increased in fishery and fishery depended industry such as fish processing. In 1992, Canadian Government entirely prohibited cod fishing in Newfoundland and this decision caused to unemployment of more than 40 thousand people. Because of the crisis and employment loss of fishing industry, which is the main component of the Newfoundland economy, US\$ 400 million financial aid brought into force by Canadian government. Similarly, Northeast Atlantic herring (*Clupea harengus*), Peruvian anchovy (*Engraulis ringens*), Alaska king crab (*Paralithodes camtschaticus*), New England groundfish, bluefin tuna (*Thunnus thynnus*) and Atlantic swordfish (*Xiphias gladius*), have been other species in crisis (Brown and Kane, 1997).

Sustainable fishery is directly related to sustainable development of contributions of fishery, viability of fishing community, and especially positive economic performance of fishing activity. Therefore, rational and comprehensive fishery management should take into account not only biological but also cultural, political, and especially socio-economic dimensions of fishery. Similarly, Whitmarsh et al. (2000) expressed that to evaluate performance of fishery and fishery management, as well as biological information, economic data and information should have considered. The economic indicators may be useful as an additional tool by providing criteria for a better fisheries management (Franquesa, 2001). Author defined these indicators and explained how decision-makers can benefit from them.

Historically, the main objective of fisheries management was the conservation of the fish stocks. In modern fisheries management this limited aim has been extended to address additional economic, social, and environmental objectives such as fishers' welfare, economic efficiency, the allocation of resources, and environmental protection. The broad objectives of fisheries management may, therefore, include the conservation of fisheries resources and their environment, the maximization of economic returns from the fishery, and payment of fees to the community from profits made by the exploitation of a public resource (King, 1995). Besides, Berkes et al. (2001) defined 22 distinct objectives for fishery management. Therefore, socio-economic information, investigations and approaches are extremely important for fishery sector and planning fisheries management policies (Cunningham, 1981; Prochaska and Cato, 1983; Meany, 1987; Jayaraman et al., 1988; Franquesa, 2001; Pomeroy, 1992; Neiland, 1992; GFCM, 1992). In this respect, need for social and economic information to develop more comprehensive fisheries management is clear, because socio-economic dimension of fisheries management can not be properly carried out without this information.

Recently, FAO and fisheries administrators from many coastal countries have been well aware of the fact that the economic and social implication of fisheries management measures can not be possible without socio-economic studies and indicators. Therefore, FAO published several fisheries technical papers and guidelines regarding economic viability of marine capture fishery (Lery et al., 1998), indicators for sustainable development of marine capture fisheries (FAO, 1999), techno-economic performance of marine capture fisheries (Tietze et al., 2001), feasibility assessment for a database on socio-economic indicators for Mediterranean fisheries (Franquesa et al., 2001), and economic performance and fishing efficiency of marine capture fisheries (Tietze et al., 2005). Furthermore, in an every year, Concerted Action: Promotion of Common Methods for Economic Assessment of European Union Fisheries has been preparing annual reports on economic performance of selected European fishing fleets to monitor fishery from the economic point of view. Recently, GFCM Technical Papers (Franquesa, 2005), was published regarding estimation of economic indicators in Mediterranean fisheries.

The work of fisheries economists is already well developed in many countries and that it is widely used for policy purposes (Neiland, 1992). However, fisheries economics is a relatively new discipline in Turkey and decision makers can not benefited from fisheries economists' studies because there are currently no comprehensive studies on it (Ünal, 2004b). On the other hand, existing a few local studies (Ünal, 1996; Ünal, 2001; Ünal, 2003; Ünal, 2004b) have never been considered by neither local nor central decision makers.

This study was carried out in six selected fishing districts namely Foca, Karaburun, Mordogan, Akyaka, Akcapinar and Marmaris during the 2002-2003 fishing season. General aims of the study were to state viability of the small scale fishing activity through the estimation of the socio-economic indicators, gross cash flows, economic and financial performance. General characteristics of the fisheries in these districts as well as overall country profile are described in section 4.1.1.

This manuscript consists of six chapters: the first provides an introduction. The second describes the objectives, and the third chapter explains the material-methods of the study. The fourth chapter provides the results; the structure, characteristics of the vessels, socio-demographic characteristics of fishermen, socio-economic indicators, cost structure and economic performance of the small-scale fishing vessels, member-cooperative relationships and problems, successes-failures of fishery cooperatives for 2002-2003 fishing season while the fifth gives discussion in which findings were discussed from the point of view of their importance for decision makers and the last chapter gives the conclusion.

2. Objectives

Research on the socio-economics of fishing communities and fishery cooperatives was carried out for the purpose of clarifying local conditions, reflecting structure of fishery, discussing viability of fishing activity and helping to formulate sound policies for the development and establishing more effective management of small-scale fisheries in the selected fishing districts, namely Foca, Karaburun, Mordogan, Akyaka, Akcapinar, and Marmaris, through numerous surveys on fishery cooperatives, costs and earnings analysis for small-scale fishing vessels, evaluation of success and failure of fishery cooperatives in Turkey.

The objectives of this study are:

- to determine socio-demographic characteristics such as age structure, sex, marital status, family size, and education level,
- to estimate costs and earnings of small-scale fishing vessels in selected fishery cooperatives' fishing area and to know whether they show an important differences between fishery cooperatives,
- to describe the common problems of selected fishery cooperatives,
- to highlight socio-economic conditions of small-scale fishermen,
- to calculate economic and financial performance of small-scale fishing vessels and evaluate the viability of small scale fishing operation as a commercial activity, which has been practiced under six fishery cooperatives in selected fishing districts,
- to describe relations between the cooperatives and fishermen, which indicate the effectiveness of cooperatives from the members' and social point of view,
- to outline the present social and economic status of these six fisheries and to prepare proposal for decision makers to be used in local fishery management plans

3. Material and methods

The research on the socio-economics of the fishing communities, and success and failure of fishery cooperatives was carried out to reveal present socio-economic status of small-scale fisheries in six selected districts in Turkey. These were three from central Aegean coast (Foca, Karaburun, Mordogan) and three from southern Aegean coast (Akyaka, Akcapinar, Marmaris) (Figure 1).



Figure 1: The study area, (1) Karaburun (2) Foca, (3) Mordogan, (4) Akyaka, (5) Akcapinar, and (6) Marmaris.

The study was conducted through numerous surveys with fishermen who were cooperative members and owners of the vessels, and heads of fishery cooperatives. Three different questionnaires were prepared; two with fishermen (to estimate the socio-economic indicators and to reveal the relationship between cooperatives and their members) and one with head of the cooperatives (to outline the activities and general status of the cooperatives).

The primary information on costs and earnings of capture fisheries was not collected on a regular basis, and updated information was not provided by the relevant authorities in Turkey. Therefore, the main data presented in this study, was gathered during the personal interviews. The study aimed to interview all the active cooperative members during 2002-2003 fishing season. The records, such as member list, participation to general assembly, foundation of cooperatives etc., were used as secondary data. The total numbers of vessel licences were obtained from these records and then active fishing vessels were determined in the region by personal inquiries through the executive board of fishery cooperatives.

A total of 127 (all were active fishermen and cooperative members)– 72% of all-regional fishermen (all were vessel owners) were interviewed (32 from Foca, 14 from Karaburun, 20 from Mordogan, 19 from Akyaka, 26 from Akcapinar, and 16 from Marmaris).

The data collected under five categories were given below. Information on the first three sections is collected in one, and the 4th and 5th sections were collected in two separate questionnaires.

1. Vessel characteristics
 - Length
 - Engine power
 - Age
 - Construction material
2. Socio-demographic characteristics
 - Fishing experience
 - Age
 - Education
 - Social benefits
 - Crew size
 - Marital status
 - Residance (owner/rented)
3. Costs and earnings data
 - Costs such as running costs, vessel costs, labour costs, repair and maintenance
 - Revenue that generated from harvesting of fish
4. Fishery cooperatives
 - Activities
 - Problems
 - Status of active members
 - Foundation year
 - Registered member
 - Active member etc.
5. Relations between the cooperatives and fishermen
 - Meeting the expectations of the members
 - Participation in general assembly
 - Getting patronage refund
 - Reason to become a cooperative member

Questionnaires were designed to reflect the fishermen's attitude about cooperatives, and to find out whether cooperatives pay patronage refund to their members. It comprised

questions regarding the nature of the relations between the cooperatives and fishermen. These also covered following topics:

- Fishermen's opinion about the cooperatives
- Cooperative role in solution of fishermen problems regarding conflicts as well as protection of fishing ground
- Satisfaction from the fishermen's point of view.

There were a few open-ended survey questions targeted to individual fisherman and fisher cooperatives on:

- Problems and opinions related to the present status and management techniques,
- Success of cooperatives and satisfaction with income,

One final question was also asked to skipper owners whether they wanted to give up their profession.

In addition to questionnaires, open ended interviews with individual fishermen and management board of cooperatives, participant observation techniques and small group discussions were also performed to obtain further information. Of the 176 active vessel owners, 49 could not be interviewed: 4 had insufficient data to fully complete the survey, 5 rejected to respond, 2 had licence problems and were not active in the fishery and the remaining was not able to contact for the personal interview (table I and figure 2).

Table I: Member structure of the cooperatives and number of fishermen interviewed.

Member Structure	Foca Coop	Karabr Co-op	Mordgn Co-op	Akyaka Co-op	Akcapinr Co-op	Marmaris Co-op
Number of cooperative members*	126	34	40	28	26	35
Others**	219	11	33	47	-	350
Active members*** (covers only small scale fishermen)	51	18	27	24	26	30
Total number of cooperative members interviewed	32	14	20	19	26	16
Rate of active members interviewed	63	78	74	79	100	53
N= 176 n= 127	N=51 n=32	N=18 n=14	N=27 n=20	N=24 n=19	N=26 n=26	N=30 n=16

* Includes crews, skipper owners and other members who were not directly related to fishery

** Includes non cooperative members, unlicensed and mostly recreational fishing vessels

*** Fishermen who had vessels were cooperative members and go fishing regularly

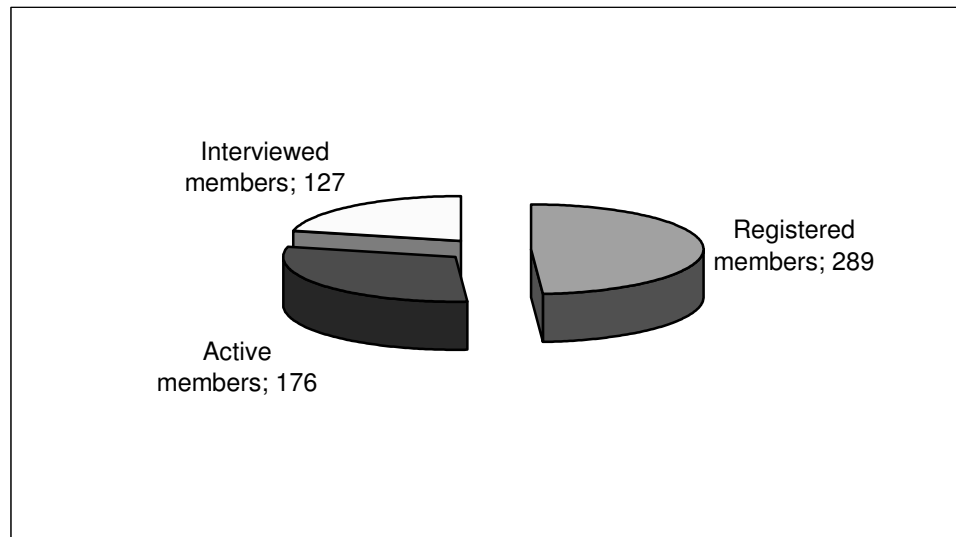


Figure 2: Total number of cooperative members, active members and interviewed members.

In this study effective exchange rate for 1 US\$ was taken as 1,571,763 Turkish Lira (TL) which was official rate used by the State Institute of Statistics Prime Ministry of Turkey for 2002 (Anon., 2004). Total and working population of Turkey were 69,626,000 and 23,206,000, respectively in 2002 (Anon., 2005).

3.1. Calculation of socio-economic indicators

It is important to use the same indicators for the all kinds of fishery in all over the world so that the economic performance of the same kind of fleets in different fishing districts or even different countries can be compared.

In the study, data permitting, maximum numbers of socioeconomic indicators were calculated. The methodology suggested by Franquesa et al. (2005) was used to calculate socio-economic indicators. To estimate economic and financial performance of fishing vessels, methodologies used by AER (2003), Tietze et al. (2001), and Davidse et al. (1993) were applied.

Because reliable information on the gross tonnage (GT) of fishing vessels was not available, instead of GT length of vessel was used for the calculation of Capacity Physical Productivity and Capacity Productivity.

Per Vessel Hour Physical Productivity was changed as Per Vessel Day Physical Productivity. The time unit was taken as 'days' instead of hours so active fishing days at sea were used for the calculation of this indicator.

3.1.1. National Indicators

- **Weight of Apparent Consumption (WAC)** shows the gross consumption weight of seafood products per inhabitant of the country.

$$\text{WAC} = (\text{Landing Weight} + \text{Import Weight} + \text{Aquaculture Production Weight} - \text{Export Weight}) / \text{Population}$$

- **Value of Apparent Consumption (VAC)** shows the gross consumption value of seafood products per inhabitant of the country.

$$\text{VAC} = (\text{Landing Value} + \text{Import Value} + \text{Aquaculture Production Value} - \text{Export Value}) / \text{Population}$$

- **Fish Commercial Balance (CB)** shows whether exports or imports of fishing products are higher in the country.

$$CB = \text{Import Value} - \text{Export Value}$$

- **Ratio Fish Employment (RFE)** indicates the ratio of employment created directly by the fishing industry in the country.

$$RFE = \text{Employment} / \text{Working Population}$$

- **Extraversion Rate (DR)** shows to what extent the fishing sector of a country depends upon foreign trade, both for imports and exports.

$$DR = (\text{Import Value} + \text{Export Value}) / (\text{Landing Value} + \text{Aquaculture Value})$$

- **Fish Contribution to the GNP (FCG)** shows the importance of fishing production in the Gross National Product.

$$FCG = \text{Landings Value} / \text{Gross National Product}$$

- **Ratio Harvesting Value (RHV)** shows the importance of fishing in comparison to aquaculture in terms of income.

$$RHV = \text{Landing Value} / \text{Aquaculture Value}$$

- **Ratio Harvesting Weight (RHW)** shows the importance of fishing in comparison to aquaculture in terms of production weight.

$$RHW = \text{Landing Weight} / \text{Aquaculture Weight}$$

- **Fish Weight Coverage Rate (CRW)** shows the rate of apparent consumption in volume terms covered by the national production (capture and aquaculture) volume.

- **Average Price Per Kilo (APK)** shows the mean price per kilo of the seafood products.

Table II: National level indicators and their formulas (Franquesa et al., 2005).

Indicators-Items	Formulas	Units
Weight of Apparent Consumption	$WAC = (LW+IMW+AQW-EXW)/P$	kg/person
Value of Apparent Consumption	$VAC = (LV+IMV+AQV-EXV)/P$	US \$/person
Fish Commercial Balance	$CB = VEX - VIM$	US \$
Ratio Fish Employment	$RFE = E / AP$	%
Extraversion Rate	$DR = (IMV+VEX)/(LV+AQV)$	%
Fish Contribution to GNP	$FCG = LV / GNP$	%
Ratio Harvesting Value	$RHV = LV / AQV$	%
Ratio Harvesting Weight	$RHW = LW / AQW$	%

3.1.2. Local Indicators

Thirteen of nineteen socio-economic indicators which were defined in Franquesa et al., (2005) were estimated in this study. These indicators are as follows:

- **Vessel Physical Productivity (VFP)** shows the average production of each vessel in terms of weight of landings.

Vessel Physical Productivity: Landing weight / Number of vessel

- **Capacity Physical Productivity (CFP)** indicates average production in terms of weight of landings for each capacity unit (Lenght) of the vessels.

Capacity Physical Productivity: Landing weight / Lenght

- **Power Physical Productivity (PFP)** shows the average production in terms of weight of landings for each power unit (HP) of the vessels.

Power Physical Productivity: Landing weight / HP

- **Per vessel Day Physical Productivity (HFP)** indicates the average production in terms of weight of landings for each day at the sea.

Per Vessel Day Physical Productivity: Landing weight / Day

- **Man Physical Productivity (MFP)** shows the average production in terms of weight of landings for each man employed.

Man Physical Productivity: Landing weight / Employment

- **Capacity Productivity (PGT)** shows average production in terms of market value in the first sale for each capacity unit (Lenght) of the vessels.

Capacity Productivity: Landing Value / Lenght

- **Vessel Productivity (PV)** shows average production in terms of market value in the first sale for each vessel.

Vessel Productivity: Landing Value / Number of Vessel

- **Power Productivity (PP)** shows the average production in terms of market value in the first sale for each power unit (HP) of the vessels.

Power Productivity: Landing Value / HP

- **Per Vessel Hour Productivity (PVH)** shows the average production in terms of market value in the first sale for each fishing day.

Per Vessel Hour Productivity: Landing Value / Day

- **Man Productivity (MP)** shows average production in terms of value in the first sale for each man used.

Man Productivity: Landing value / Employment

- **Invested Capital (IC)** shows the current value of the whole of the vessels.

- **Opportunity Cost (OP)** shows the yields that the owner could obtain should he invest his money in National Debt instead of investing in his business. This means that the owner is relinquishing that potential income. There is a profit in its economic sense when the yields of the invested capital surpass the opportunity cost.

Opportunity Cost: Invested Capital x Yearly Interest Rate*

* In this study, imputed interest rate (real interest rate) (Davidse et al., 1993; AER. 2003) was used for the calculation of the opportunity cost. This rate is the difference between the rate for Government Bonds and the inflation rate.

Imputed Interest Rate (Real Interest Rate) = Rate for Government Bonds – Inflation Rate

Opportunity Cost = Invested Capital x Real Interest Rate

- **Landing Prices** (LP) represents the average market price of landings per kilo.

Landing Prices: Landing Value / Landing Weight

Table III: Local level indicators and their formulas (Franquesa et al., 2005).

Indicators	Formulas	Items
Vessel Physical Productivity	Landing weight / Number of vessel	Kg
Capacity Physical Productivity	Landing weight / Lenght	Kg/Lenght
Power Physical Productivity	Landing weight / HP	Kg/HP
Per Vessel Hour Physical Productivity	Landing weight / Time	Kg/Day
Man Physical Productivity	Landing weight / Employment	Kg/Man
Landing Prices	Landing Value / Landing Weight	\$
Man Productivity	Landing value / Employment	\$/Man
Invested Capital	Current value of the whole of the vessels	\$
Opportunity Cost	Invested Capital x Yearly Interest Rate	\$
Capacity Productivity	Landing Value / Lenght	\$/Lenght
Vessel Productivity	Landing Value / Number of Vessel	\$
Power Productivity	Landing Value / HP	\$/HP
Per Vessel Hour Productivity	Landing Value / Time	\$/Day

3.2. Calculation of costs and economic performance

3.2.1. Calculation of costs

In this study to evaluate the viability of small-scale fishing operations as a commercial activity two kinds of cost were considered: real costs and theoretical (imputed) costs. Real costs are fixed and variable costs such as vessel costs, running costs. Theoretical costs are the costs that fishermen do not pay as cash such as opportunity cost, depreciation. In this study, imputed amount was estimated for the opportunity cost and as well as labour costs (it is actually real cost) due to majority of vessel owners work alone or with a family member.

Labour cost: Costs of all labour is included as theoretical cost to the total costs. For the skipper-owner an imputed amount is calculated in cases (mostly) a salary is not paid to him (Davidse et al., 1993). Crew(s) from skipper-owner's family members such as his son, wife are also included to the calculation. Therefore, it was used minimum wages accepted by government for the year 2002 to estimate this cost.

Total Labour Costs = Minimum daily wage x Days at the sea x Number of crew including skipperowner

Running costs: Running costs include fuel, lubricant, and the cost of selling fish, harbour dues, the cost of bait, salt, ice, and of food and supplies for the crew.

Vessel costs: Vessel costs include vessel and gear repair and maintenance expenses and vessel insurance.

Depreciation: Total amortization was calculated through the formula below
Depreciation = Replacement value of the vessel including engine and gear - Total present value of the capital / Average age of the vessel including engine and gear

Interest: Interest cost was considered zero due to none of the small-scale fishing vessels used bank credit.

Opportunity cost: Opportunity cost of capital, which explained above as a socio-economic indicator, was estimated and added to total costs to estimate net profit. However, instead of yearly bank interest rate, imputed interest rate (Rate for Government Bonds - Inflation Rate) was used for the calculation.

Opportunity Cost = Invested Capital x Real Interest Rate

3.2.2. Calculation of economic and financial performance

To assess the economic and financial performance of fishing vessels, two indicators were used. The economic performance was measured by the net cash flow (NCF), which is equal to the net profit. This was calculated as the value of landings minus all costs including the costs of depreciation and imputed interest. The NCF or net profit can be seen as the reward for entrepreneurship and expresses the absolute income of the entrepreneur or owner of the vessel. Another closely related indicator of economic performance is the NCF/total earnings (TE) ratio, which expresses the NCF or net profit as a percentage of the TE. A ratio of more than 10 percent can be considered as good (Tietze et al., 2005).

The financial performance was measured by the NCF/investment ratio, also referred to as rate of return on investment (ROI). A level of 10 percent is generally considered to be a good result. The NCF or net profit expressed as a percentage of the invested capital indicates the profitability of the investment in relation to other alternative investments (Tietze et al., 2005).

Gross cash flow: Value of landings minus all cost, except depreciation and an imputed interest amount.

Net cash flow (Net profit): Value of landings minus all cost, including depreciation and an imputed interest amount.

Economic performance: The economic performance is assessed through the ratio net profit/total earnings (NP/TE).

Financial performance: The financial performance is assessed through the ratio net profit/capital investment also called return on investment (ROI).

3.3. Success and failure of fishing cooperatives

Factors influencing the success or failure of fishery cooperatives based on some of criterias explained and advised by Pollnac (1988). Some of these factors are group size, qualified business management, availability of capital, participation to general assembly (meeting attendance), providing inputs to the members, percentage of members who sell their fish through his cooperative (selling fish outside the cooperative). In addition to these factors, years in fishing, percentage of members having conflicts with the cooperatives, percentage of members find cooperative successful, attraction of membership, combating illegal fishing in cooperative area, increases in capital, providing patronage refund, solidarity among members, education service, which were also objectives of cooperatives and involved in meeting expectation of members, were also considered in this study.

Amongst these factors quantitative values were obtained for “meeting attendance”, “selling fish outside the cooperative”, “members having conflicts with the cooperatives”, “group size”, “years in fishing”, “members find cooperative successful”, “membership is attractive enough”, and qualitative answers were obtained for “providing inputs to the members” as yes/no/fairly yes, “combating illegal fishing in cooperative area” as good/weak/bad, “founded on local initiative or imposed from outside” as yes/no, “qualified business management” as yes/no, “providing inputs to the members” as yes/no, “combating illegal fishing in cooperative area” as yes/no/fairly yes, “increases in capital” as yes/no, “providing patronage refund” as yes/no, capital availability as yes/no/fairly yes, “solidarity among members” as yes/no, “education service” as yes/no.

To avoid taxation, most of the cooperatives in Turkey tend to keep unreliable financial records. Therefore, financial performance of the cooperatives, which is also considered as one of the most important indicators for success or failure, was not evaluated in the study. Moreover, socio-economic variables, which used in the study, are more basic, more reliable, easier to provide, and play more important role in cooperative success and failure.

4. Results

4.1. Structural, technical and social characteristics

4.1.1 Country profile and fishery structure: an overview

Turkey has an unique geographical position at the crossroads between Europe and Asia. It is surrounded by the Black Sea in the north, the Mediterranean Sea in the south, and the Aegean Sea in the west. Total population was 69,626,000 in 2002 while working population was 23,206,000. A summary of basic economic data is shown in the table IV.

Table IV: A summary of economic profile of Turkey in 2002 (Anon., 2005).

Some General Indicators	Units	Results
Area	km ²	777,945
Shelf area (to 200 m)	km ²	154,080
Length of the coastline	km	8333
Rivers	km	175,714
Population (mid-year)	People	69,626,000
Working population	People	23,206,000
Agriculture Working Population	People	6,745,000
Population growth rate	%	1.57
Unemployment rate	%	10.3
Unemployment rate	Male	10.7
Yearly Interest Rate	%	50.0
Inflation Rate	%	47.2
Gross National Product (GNP)	Million \$	239,235
Gross Domestic Product (GDP)	Million \$	241,302
Exports	Million \$	36,059
Imports	Million \$	51,554
Rate of imports covered by exports	%	69
Balance of foreign trade	Million \$	- 15,495
GNP Per Capita	\$	2,598
Share of fishery in GNP	%	0.2
Share of fishery in agricultural sector	%	2.7

With 8,333 km of coastline, over 1,200 hectares of lakes, and many rivers, Turkey has extensive water resources and, is rich in fish and other marine and fresh water products (Table IV). There are some 247 known marine fish species in the Black Sea, 200 in the Sea of Marmara and 500 in the Mediterranean (Bilecenoğlu et al., 2001). Table V shows the main national fishery background data of Turkey.

Table V: National fisheries background data of Turkey in 2002 (Anon., 2004).

Background Data-Items	Units	National Results
Total Production Weight	Tonnes	627,847
Total Production Value	\$	571,714,349
Import Weight	Tonnes	22,531
Import Value	\$	18,754,783
Export Weight	Tonnes	26,860
Export Value	\$	96,728,389
Fisheries Working Population	People	57,520
Aquaculture Weight	Tonnes	61,165
Aquaculture Value	\$	143,943,304
Domestic Consumption	Tonnes	466,289
Not Processed or Consumed	Tonnes	1,230

Fisheries in Turkey is characterized as multispecies, multigears and targeted mainly demersal and pelagic fish stocks as in other Mediterranean countries. Turkey ranked as 32nd country in the world in 2002 with a total production of 627,847 tonnes (Anon., 2004). The State Institute of Statistics, Fishery Statistics states that small-scale fishery (having more than 90 percent of total number of fishing vessels) provides less than 10 percent of the total catch in terms of weight. Vessels involved in small scale fishery are 5-12 meters in length and they usually have up to 70 HP engine power. They are mostly locally built wooden vessels equipped with inboard engines and operate various gillnets and longlines. The main species caught by small-scale fishery are *Mullus surmuletus*, *Mullus barbatus*, *Boops boops*, *Spicara smaris*, *Octopus vulgaris*, *Sarpa salpa*, *Diplodus annularis*, *Sepia officinalis*, *Loligo vulgaris*, *Sparus aurata*, *Diplodus vulgaris*, *Mugil spp.*, *Dicentrarchus labrax*, *Pomatomus saltatrix*, *Oblada melanura*, *Epinephelus aeneus*, *Scomber scombrus*, *Solea vulgaris*, *Lithognathus mormyrus*, *Sarda sarda*, *Diplodus sargus*, *Dentex dentex*, *Pagellus erythrinus*, *Penaeus kerathurus*, and *Sardina pilchardus*.

Large scale fishery is characterized by trawlers and purse seiners that produce about 90 percent of the total catch. *Sardina pilchardus*, *Engraulius encrasicolus*, *Scomber scombrus*, *Mugil spp.*, *Pomatomus saltatrix* are the main species caught by purse seines and *Merluccius merluccius*, *Mullus surmuletus*, *Mullus barbatus*, *Paraparaeus longirastris*, *Lophius piscatorius*, *Solea solea* by trawlers. Among highly migratory species, the main economic species are bluefin tuna, swordfish, and albacore. Fish production consists mainly small pelagic species. Only European anchovy itself composed 60 percent of the total catch in 2002. The fishing fleet in 2002 comprised of 18,542 vessels of which only 7.7 percent were trawlers and purse seiners and the rest were inshore fishing vessels. Table VI shows some characteristics of Turkish fishery from 1999 to 2002.

Table VI: Basic data on the fisheries sector in Turkey (1999-2002) (Anon., 2004).

Years and characteristics	1999	2000	2001	2002
Total production	636,824	582,376	594,977	627,847
Marine catch	523,634	460,521	484,410	522,744
Aquaculture production	63,000	79,031	67,244	61,165
Fresh water production	50,190	42,824	43,323	43,938
Total number of fishing vessels	13,381	12,989	17,696	18,542
Number of trawler	750	538	566	566
Number of purse seiner	575	472	448	448
Trawler-Purse seiner	-	146	416	416
Others	12,056	11,833	16,266	16,266
Domestic consumption	503,249	538,764	517,832	466,289
Processed amount of fish meal and oil in factories	150,000	71,000	62,755	156,000
Not processed or consumed	7,172	2,309	8,383	1,230
Per capita consumption	7.6	7.9	7.5	6.7

Fisheries Institution and Management in Turkey

In 1960s, the Ministry of Commerce had almost all functions related to fisheries management in Turkey. After a decade, The Ministry of Agriculture and Rural Affairs (MARA) has taken the major responsibility of fisheries.

The Fisheries Code (Number 1380) was passed in 1971 replacing the old fishing code *Zabita-i Saydiye Nizamnamesi* giving the duty of fisheries conservation,

improvement, production, research, education and dissemination to the MARA (Ozesmi, 1999).

In 1972, a General Directorate was founded under MARA. However, in the following years DG Fisheries changed to Fisheries Department and finally in 1984 was entirely removed.

In 1984, reorganization was started and new units and directorates were constituted:

- The General Directorates of Protection and Control
- The General Directorates of Organisation and Support
- The General Directorates of Project and Application
- The Research Planning and Coordination Committee

All activities in fisheries are based on the Fisheries Code No. 1380, enacted in 1971. The Fisheries Code No. 1380 of 1971 as amended by code 3288 of 1986 and in 1987, three Fishery Research Institutes were founded.

Following duties were given to MARA in both codes are:

- to assign fishing licence for fishing vessels,
- to perform the duties specified in the both laws,
- to develop and implement fisheries policy,
- to take measures to prevent water pollution,
- to assist the services such as credits and other inputs,
- to implement training programme for fishermen,
- to promote and support fishery cooperatives,
- to collaborate with universities, research institutes etc. to sustain fishery and to increase productivity,
- to describe and determine the required characteristics of fishing gears,
- to determine rules and requirements regarding hiring fishing ports, fish production areas,
- to take measures regarding fishery resources,
- to gather and evaluate fishery information,
- to examine aquaculture projects and to evaluate if they are environmentally and economically reasonable,
- to perform investigations and research,

Today, MARA is the main state organisation responsible for fisheries administration, regulation, protection, promotion and technical assistance through four General Directorates. Based on this law (1380), regulations and circulars are prepared to regulate fisheries. According to Laws 1380 and 3288 and Continental Waters Law No. 2674 of 1982, foreign vessels are not allowed to take part in commercial fishing activities. In accordance with the Laws, every second year commercial fisheries and sport fishing circulars are published and announced in the Official Gazette-*Resmi*

Gazete. MARA undertakes its duties in fisheries management through four General Directorates, as well as the District and 81 Provincial Directorates. The general institutional structure of the fisheries sector in Turkey is shown in Figure 3 (OECD, 2005).

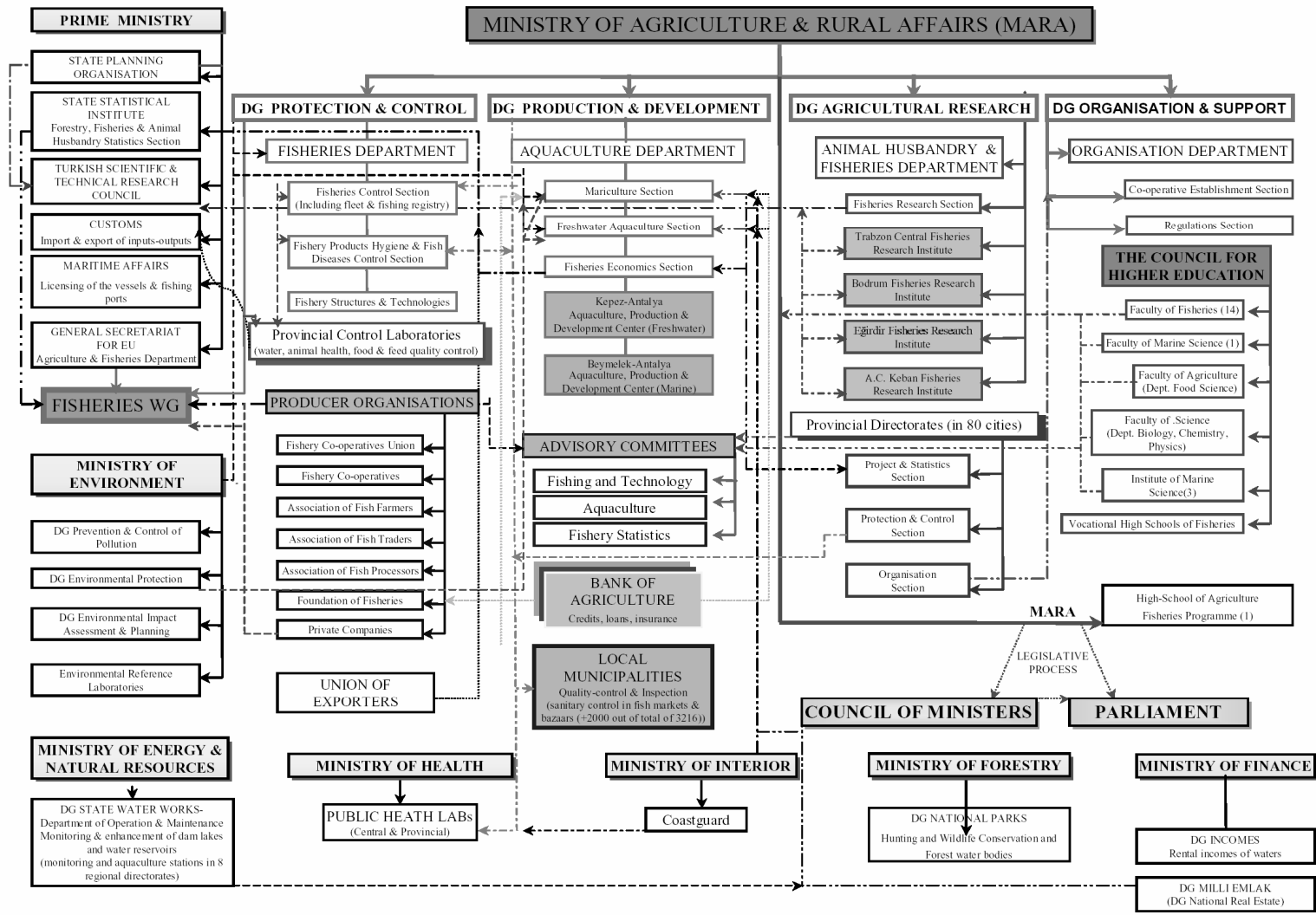


Figure 3: Institutional structure of the fisheries sector in Turkey (OECD, 2005).

Fisheries Regulations

MARA is the responsible for formulation of fisheries management plan, implementation of fishing regulation, and control of the fishing activities through the Control Sections of 81 Provincial Directorates which are organized under General Directorate of Control and Protection (GDCP). MARA publishes a circular every alternate year in order to regulate marine and inland fishery. These regulations are based on several criterias such as minimum mesh size (trawl cod-end restrictions 40 mm and 44 mm in the Black Sea and other seas, respectively), minimum landing size (such as 30 cm for white grouper, 13 cm for red mullet or 70 cm for sword fish or 1 kg for the octopus), closed areas, closed season (such as four months for purse seiners and 2.5 to 4 months depending on the fishing ground for trawlers), gear or fishing methods restrictions and bans, and catching prohibition for some species (dolphin, sea turtles etc.). The Fishery Circular (MARA., 2004) that covers detailed and clear rules to regulate fishery consist of five main parts which are as follows:

1. Bans related to seas

Section 1: Trawl bans

Section 2: Species and size bans

Section 3: Gear prohibition

Section 4: Measures for lagoon areas

Section 5: Region and area prohibition

Section 6: Other bans

2. Bans related to inland waters

1. Closed season

2. Species and size bans

3. Inland waters for which fishing is partly or totally prohibited

4. Other bans

3. Precautions regarding marine and inland waters

4. Rules related to water pollution

Organisations Playing Role in Fisheries Management

1. The Ministry of Agriculture and Rural Affairs and related units

- The General Directorates of Protection and Control

- The General Directorates of Production and Development

- The General Directorate of Agricultural Research

- The General Directorates of Organisation and Support

2. The Under Secretariat of the Foreign Trade

3. The Ministry of Environment and Forestry

4. The Ministry of Interior

5. The Ministry of Health

6. The Ministry of Energy and Natural Resources

7. Municipalities

8. Non Governmental Organisations (NGOs) and Civil Society

- The Underwater Research Society - Mediterranean Monk Seal Research Group (SAD/AFAG),
- Turkish Marine Environment Protection Association (Deniz Temiz/TURMEPA),
- Turkish Marine Research Foundation (TUDAV),
- Turkish Aquaculture Associations,
- Turkish Aegean Aquaculture Associations etc.

9. Fishery Research Institutes

- Trabzon Central Institute of Fisheries Research
- Egirdir Fisheries Research Institute
- Elazig Keban Fisheries Research Institute
- Beymelek Fisheries Research Institute

10. Universities

- Faculties of Fisheries
- Faculty of Marine Sciences

11. Fishery Cooperatives and Associations

- 413 Fishery Cooperatives (21,719 members)
- 8 Fishery Cooperative Associations
- 1 Central Associations of Fishery Cooperatives (SUR-KOOP)

12. Advisory Committees

- Central Fishery Advisory Committee
- Regional Fishery Advisory Councils

4.1.2. Fishery structure in the study area

Fishery plays a relatively important role such as sea food supply to local market, generating income and employment in the local economies of the selected fishing districts; Foca, Karaburun, Mordogan, Akyaka, Akcapinar, and Marmaris.

The fisheries in the study area have multispecies and multigear nature in common to the Mediterranean Sea. The fishery statistics of Turkey (Anon., 2002a) reported that the Mediterranean (including the Aegean) region contribute about 8.7 percent of the total fish catch in Turkey while the Black Sea region contributes about 77 percent. Mediterranean waters are biologically poorer than the other seas of Turkey. On the other hand, species have a higher market value in the Mediterranean. In the study areas, fisheries targets of a variety of species such as *Mullus surmuletus*, *Mullus barbatus*, *Epinephelus aeneus*, *Epinephelus guaza*, *Pagellus erythrinus*, *Merluccius merluccius*, *Boops boops*, *Dentex dentex*, *Sparus aurata*, *Diplodus vulgaris*, *Trachurus spp.*, *Mugil spp.*, *Octopus vulgaris*, *Sepia spp.* and *Loligo vulgaris*. Some of the targeted commercial species such as *Epinephelus aeneus*, *Epinephelus guaza* have long life span and therefore the require extra attention interms of recourse management.

Small-scale fishing vessels that use gill nets, trammel nets, long-lines and lift nets dominate the fishing fleet in all the six cases but a higher number of trawlers existed in Foca and Karaburun compared to Mordogan, Akyaka, Akcapinar, and Marmaris. Licensed

and unlicensed part-time fishermen are quite common in small-scale fishery. In addition, except for Karaburun, small-scale fishery offers more employments than large-scale fishery in all the fishing districts.

The vessels used in small-scale fisheries are 5 - 12 meters length, locally built and wooden. Each vessel is operated by one or two, rarely three fishermen, but fishermen usually go fishing alone. Fishermen using long line and gill nets go to the fishing ground in the evening, set the gears and return home. In the morning, they retrieve the gear and return to the port with their catch. The mean catch usually ranges from 2.0 to 7.2 kg per day. Fishermen usually have to sell their whole catch, to maximize the income. They also wish to bring some of the catch home (but usually low-value species) for household consumption.

Although small scale vessels dominate the fishing activity in majority of the study areas, locally registered large scale vessels also exists. Purse seiners amongst these are rather few. However, one of the study districts, Foca, is the main base of the demersal trawl fleet in the Aegean Sea, with more than fourty registered trawls. Nevertheless, the actual number of operating trawlers in this district was about twenty in 2002-2003 fishing season. In other words, almost half of the locally registered vessels were inactive. However, in common to the general characteristics of Turkish fishery, many large scale vessels registered in other areas (especially in the Black Sea harbours) operate in the fishing grounds of the study districts. Most of the trawl vessels registered in the study districts were between 15 and 27 meters length with 145-600 HP engines. The vessels are constructed by using both wooden and steel material, and are usually run by 3-5 fishermen including skippers who are also usually owners. Some of the trawlers, also fish in international waters. Even though there is no subsidy for electronic marine equipment, these vessels are well equipped with radars, echo sounders, computers, soft ware programmes, satellites etc.

There have always been conflicts between large-scale fishery (trawlers and purse seiners) and small-scale fishery. In the study area, management boards of fishery cooperatives from each district claimed that serious conflicts between the trawl, purse seine and inshore fishery have always existed. Inshore fishermen blamed trawlers for giving damage to their fishing ground, fish stocks and fishing gears. In addition to this, they also blamed purse seiners for the harmful effects on pelagic fish stocks. In spite of such blames, 24 trawl fishermen (17 skipper owner and 7 crews) were members of Foca Fishery Cooperative. The other five cooperatives had no members from large scale fishery. One local purse seiner wanted to join to Fishery Cooperative in Akyaka but the management board of cooperative was insisted to remain only small-scale fishermen based cooperative and not to accept any member from large scale fishery.

Limited fishing areas of small scale fishery are also used by trawlers and purse seiners that are equipped with modern technology. Purse seiners can operate their fishing gear very close to the shore (fishing is allowed for deeper than 11 m for small and deeper than 18 m for large purse seines) and trawlers can operate in the waters 1.5 or 3 miles distance away from the coast. Furthermore, large scale fishing vessels from other regions, especially from the Black Sea, often fish in the same areas. To use the same area by both groups creates unequal competition between the local small scale fishery and large scale fishery practiced by both local and outsiders. Besides the problems of sharing fishing areas between small and large scale fishery, there are also several problems among small scale fishermen themselves. These are as follows:

- a. Fishing in a forbidden area
- b. Fishing with unlicensed vessels

- c. Damaging gears or catch of each others
- d. Conflicts between the members and non cooperative members
- e. Not to sell fish through the cooperatives
- f. Fishing with forbidden gears
- g. For not having special fishing rights despite renting the fishing area.
- h. Difficulties in establishing autocontrol systems

Amongst the basic fisheries management tools and regulations fixed by the Fishery Circular published by MARA, minimum landing size of commercial species, mesh size regulations, closed seasons, and closed areas are in practice in the study area.

4.1.2.1. Vessel characteristics in the study areas

During the personal interviews carried out in this study, average overall length for the vessels were 6.7 meter in Foca, 5.7 meter in Karaburun, 7.5 meter in Mordogan, 7.6 meter in Akyaka, 8.1 meter in Akcapinar, and 7.9 meter in Marmaris. Range was from 5 meter to 12 meter. Average engine power of these vessels are 19.9 in Foca, 9.4 in Karaburun, 27.7 in Mordogan 11.9 in Akyaka, 16.2 in Akcapinar, and 14.8 in Marmaris. As shown figure 4 below, Mordogan has the most powerful fishing vessels on the middle Aegean costs and while Kraburun has the least. On the south coast of the Aegean lengths of the vessels are close to each others but Akcapinar has more powerful engines compared to the others (table VII).

As regards to the age structure of the small-scale fishing fleet, it appears that the fishing vessels and engines are aging. Only age structure of fishing fleet in Akcapinar was healthy. In that 73 percent of the vessels were less than ten years old and 27 percent were between 10 and 13 years old. The average ages of the fishing vessels, were found to be 14.4 years in Foca, and 23.4 years in Karaburun, 14.3 years in Mordogan, 14.1 years in Akyaka, 6.4 years in Akcapinar, and 19.2 years in Marmaris. Over 45 percent of all vessels were equal to or more than 15 years old (tabel VII and figure 5). In terms of construction, all of the vessels were of wood construction.

Table VII: Length, power and age of the vessels in the study area.

Vessel characteristics	Foca Co-op	Karabr n Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Age of vessel (Min-Max) Mean \pm SD	(1-45) 14.4 \pm 11.2	(10-33) 23.4 \pm 6.9	(1-29) 14.3 \pm 6.8	(1-30) 14.1 \pm 8.6	(1-13) 6.4 \pm 3.4	(7-31) 19.2 \pm 8.1
Length of vessel (Min-Max) Mean \pm SD	(5-11) 6.7 \pm 1.2	(5-6) 5.7 \pm 0.3	(6.1-12) 7.5 \pm 1.6	(5.7-8.5) 7.6 \pm 0.6	(6.6-9) 8.1 \pm 0.5	(6.4-10) 7.9 \pm 0.9
Age of engine (Min-Max) Mean \pm SD	(3-34) 15.8 \pm 9.8	(1-27) 14.1 \pm 6.5	(6-20) 14.8 \pm 4.5	(4-28) 14.3 \pm 7.4	(2-29) 15.8 \pm 8.2	(5-30) 16.9 \pm 7.6
Power of engine (HP) (Min-Max) Mean \pm SD	(5-85) 19.9 \pm 21.4	(6-13) 9.4 \pm 1.7	(9-140) 27.7 \pm 38.4	(9-28) 11.9 \pm 5.0	(9-32) 16.2 \pm 6.3	(9-32) 14.8 \pm 8.5
N=176 n=127	N=51 n=32	N=18 n=14	N=27 n=20	N=24 n=19	N=26 n=26	N=30 n=16

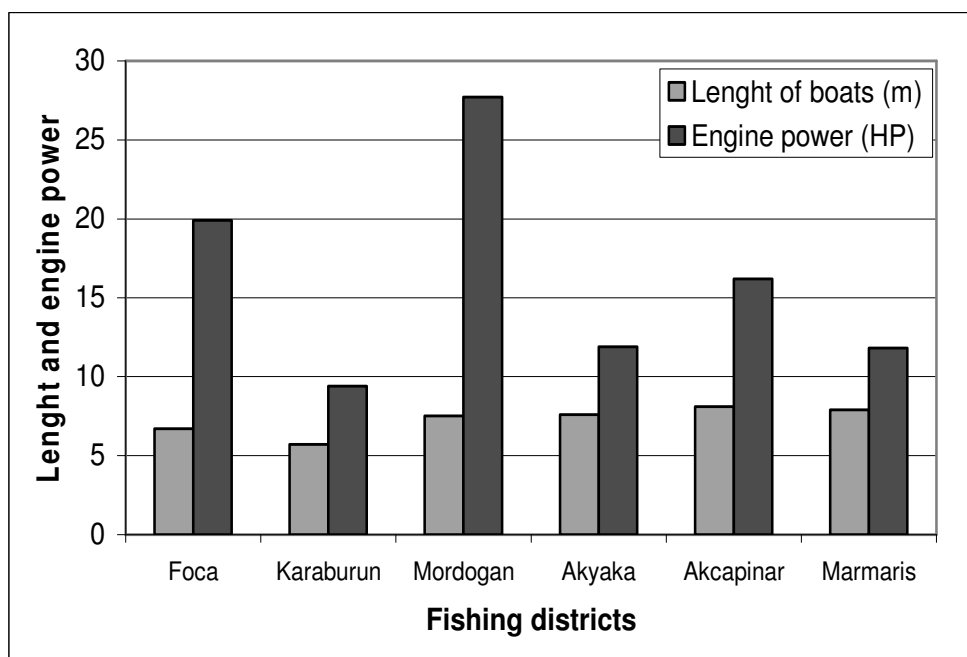


Figure 4: Comparison of mean length and engine power of small-scale fishing vessels in the study area.

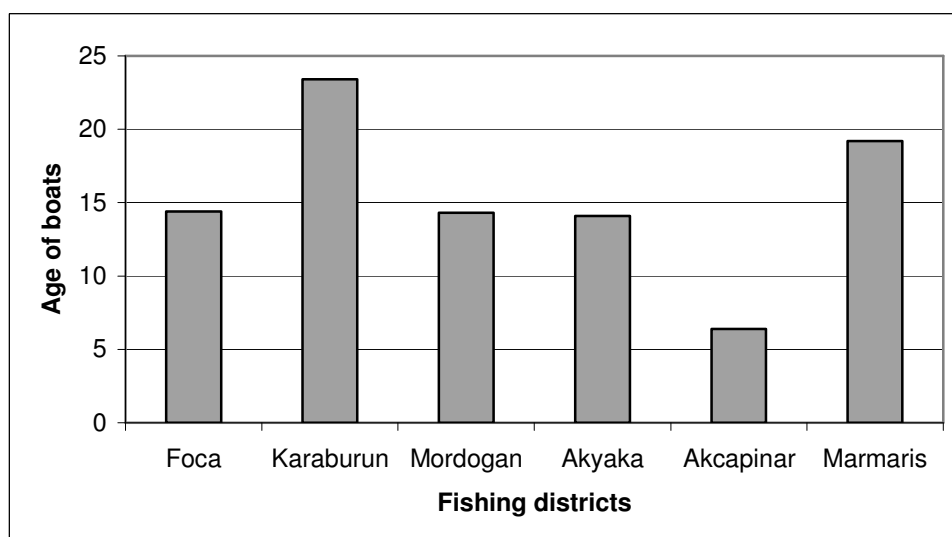


Figure 5: Comparison of mean age of small-scale fishing vessels in the study area.

4.1.2.2. Socio-demographic characteristics of fishermen in the study areas

The average age of fishermen found to be more than 40 years for all the regions (oldest in Karaburun, 56.5 years old and youngest in Akyaka, 43.2 years old) and more than 95 percent of fishermen at the central coast and more than 80 percent at the southern Aegean coast were married. They were at least responsible for livelihoods of 2 family members. Percentage of enquired fishermen defined and accepted fishery as his main occupation are 53 percent (Foca), 13 percent (Karaburun), 67 percent (Mordogan), 95 percent (Akyaka). All of the fishers in Akcapinar and Marmaris find fishery as their main job. But percentages of those who accepted fishery as their only source of income were determined as follows: 34 percent (Foca), 57 percent (Mordogan), 63 percent (Akyaka), 46 percent (Akcapinar), and 56 percent (Marmaris). However, there was no cooperative member who declared fishery as his only income source in Karaburun (figure 8). All of the cooperative member fishermen were retired people or they have another work. Therefore, part time fishers dominated small scale fishery in Karaburun. In contrast

to Karaburun, more than half of the fishermen defined fishery as their main occupation in Mordogan and Foca (table VIII).

Table VIII: Socio-demographic characteristics of small-scale fishermen.

Socio-demographic characteristics	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Age of fishermen (Min-Max) Mean \pm SD	(24-71) 47.9 \pm 12.6	(38-74) 56.5 \pm 10.6	(23-64) 44.5 \pm 11	(20-64) 43.2 \pm 10.1	(23-62) 45 \pm 9.3)	(29-70) 45.9 \pm 12.8
Experience of fishermen (year) (Min-Max) Mean \pm SD	(6-55) 26.2 \pm 13.3	(6-60) 31.7 \pm 13.7	(10-50) 26.5 \pm 11	(8-42) 23.4 \pm 9.1	(5-40) 23.5 \pm 9.2	(6-45) 28.1 \pm 11.8
Household population (Min-Max) Mean \pm SD	(1-9) 4.1 \pm 1.6	(2-9) 4.3 \pm 1.6	(2-6) 3.8 \pm 1.1	(2-11) 4.4 \pm 1.9	(2-7) 4.3 \pm 1.3	(2-7) 4.4 \pm 1.4
Dependent family members (Min-Max) Mean \pm SD	(0-5) 2.5 \pm 1.2	(1-3) 1.9 \pm 0.8	(1-5) 2.6 \pm 1.1	(0-9) 2.4 \pm 2	(0-6) 2.6 \pm 1.7	(0-4) 2.2 \pm 1.3
Defining fishery as a main occupation(%)	53	13	67	95	100	100
Fishermen declared fishery as his only income source (%)	34	none	57	63	46	56
Having social Security (%)	37	93	24	58	77	75.5
House Owner (%)	40	100	73	62	8	21
Married (%)	95	100	96	77	89	82
N=176 n=127	N=51 n=32	N=18 n=14	N=27 n=20	N=24 n=19	N=26 n=26	N=30 n=16

The education levels of survey respondents' ranged from primary school to high school, and mean education level was middle school. At the central Aegean coast, education level of fishermen, having social security and house owners were the highest in Karaburun where the part time fishery and retired persons among fishermen were dominant, and relatively low in Foca and Mordogan. Average fishing experiences were 26.2 years in Foca and 26.5 in Mordogan, and 31.7 years in Karaburun while it was very similar in southern

Aegean with an average of 23.4 in Akyaka, 23.5 in Akcapinar, and 28.1 in Marmaris (table VIII). Comparison of fishermen age and experience can be seen well in figure 6 below.

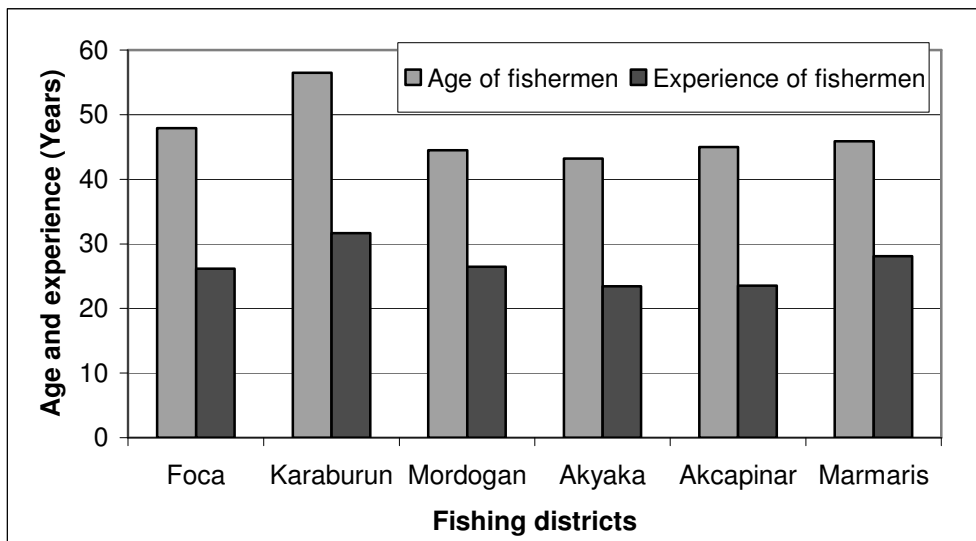


Figure 6: Comparison of mean age and experience of fishermen in the study area.

Mean household population is higher in Marmaris and Akyaka on the south coast of Aegean and in Karaburun on the central coast of Aegean (figure 7). On contrast to percentage of fishermen declared as his only income source (figure 8), highest percentage of fishermen who have social benefits are also in Karaburun (figure 9).

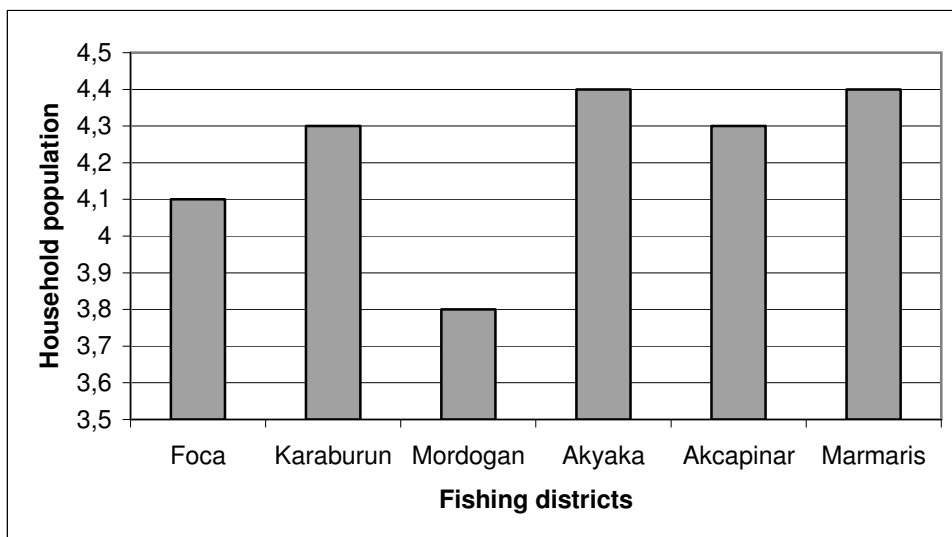


Figure 7: Comparison of mean household population of fishermen in the study area.

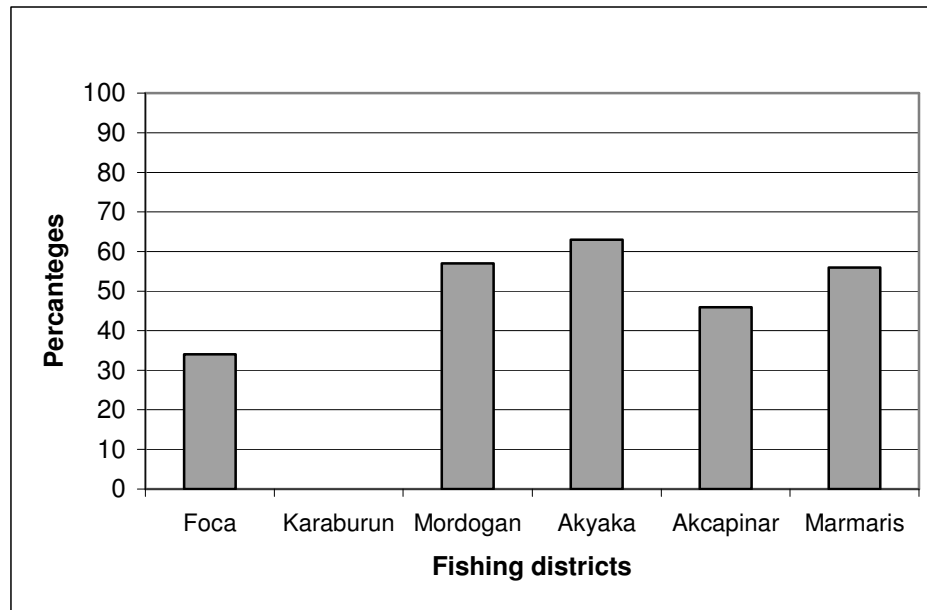


Figure 8: Comparison of percentages of fishermen who declared fishery as his only income source.

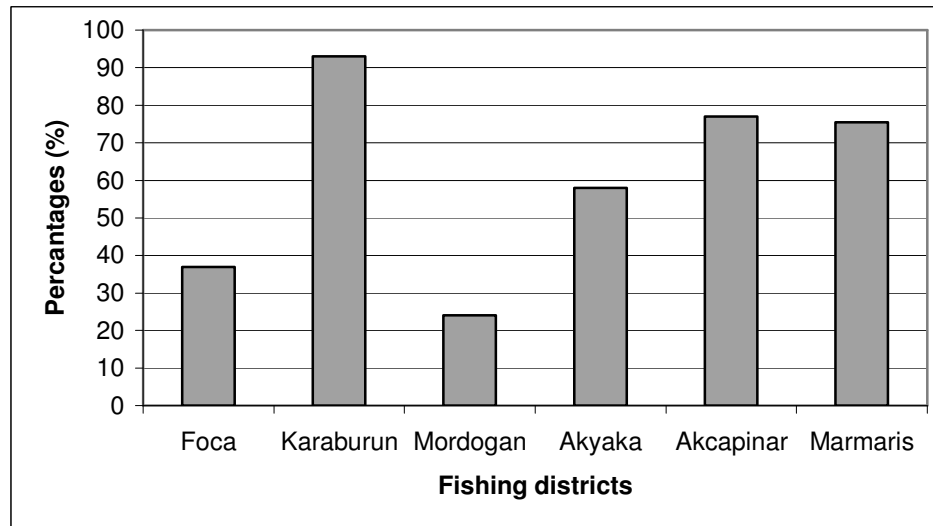


Figure 9: Comparison of percentages of fishermen having social security.

4.2. Socio-economic indicators

4.2.1. National level indicators

Although, the country has rich aquatic water resources and surrounded by seas from its three sides, national level indicators of Turkey related to fisheries pointed out that fishery sector has not got important place in the national economy. The weight of apparent consumption is 6.7 kg/person, which is rather low, compared with many other coastal countries. Ratio fish employment and fish contribution to GNP is 0.002 percent. Table IX provides outcomes of national level indicators.

Table IX: National Indicators of Turkey, 2002.

Indicators-Items	Units	Results
Weight of Apparent Consumption	kg/person	6.7
Value of Apparent Consumption	\$/person	9.2
Fish Commercial Balance	\$	-77,973,606
Ratio Fish Employment	%	0.002
Extraversion Rate	%	0.2
Fish Contribution to GNP	%	0.002
Ratio Harvesting Value	%	96.0
Ratio Harvesting Weight	%	89.7

4.2.2. Local level indicators

Regarding Vessel Physical Productivity (Kg), which shows the average production of each vessel in terms of weight of landing, each cooperative has different quantity as table X and figure 10 shows. The highest values are found in Mordogan (1583.1) followed by Akyaka (1199.3), Foca (725.9), Marmaris (492.1), Akcapinar (416.4), and Karaburun (388.4).

In terms of Capacity Physical Productivity (Kg/Length), the rank is almost the same as it is in Vessel Physical Productivity. Instead of Karaburun, the lowest result belongs to Akcapinar. Mordogan (212.2) has the highest Capacity Physical Productivity followed by Akyaka (156.9), Foca (108.6), and Marmaris (73.9) as shown in table X and figure 11.

Compared to Akyaka, average horse power of small-scale fishing vessels in Mordogan is 27.7 which are more than double of average horse power in Akyaka. Therefore, Power Physical Productivity (Kg/HP) is higher in Akyaka (101) than it is in Akcapinar (57.1). Though, the result of Karaburun (41.2), where part-time fishery dominate fishery and which has the worst results in terms of Per Vessel Day Physical Productivity, are close to Mordogan. Results are similar in Foca (36.4) and Marmaris (39.5) while the lowest in Akcapinar (25.7). Table X and figure 12 show comparison of results for the six cases.

In terms of Per Vessel Day Physical Productivity (Kg/Day), which indicates the average production in terms of weight of landing for each active fishing day at the sea, results are as follows: the highest in Mordogan (7.2) followed by Akyaka (5.3), Marmaris (4.0), Foca (3.9), and Akcapinar (2.2). It is the lowest in Karaburun (2.0) as shown in table X and figure 13.

Man Physical Productivity (Kg/Man), which shows the average productivity in terms of weight of landings per employed man, is the highest in Akyaka because of low level crew size of fishing vessels and the lowest in Karaburun (2.0) due to little catch amount and relatively larger crew size. In terms of Man Productivity (\$/Man), the results are very similar due to the same reasons mentioned for Man Physical Productivity. Overall

results of both Man Physical Productivity and Man Productivity are as shown in table X and figures 14-16.

Landing Prices (\$) in each study area is remarkably high. Average price of fish in Akcapinar where results usually show fishery is rather weak and fishers catch very little amount of fish, is the highest (\$7.0). Akyaka follows Akcapinar with \$6.4 average catch price. The rest show similarities between 5.1 and 5.7 as shown in table X and figure 15.

In terms of Invested Capital (\$), which indicates the current average values of vessels, there is a great difference between the fishing vessels of six cooperatives. However, the differences may be resulted from age of the vessels and structure of the fishery in each cooperative. Table X and figures 17-18 show total current values of fishing vessels, and opportunity cost of capital in each cooperative.

Table X: Socio-economic indicators of small-scale fishery in six selected fishing cooperatives in Turkey.

Indicators and Items	Foca Co-op	Karabn Co-op	Mordog Co-op	Akyaka Co-op	Akcapinr Co-op	Marmaris Co-op
Vessel Physical Productivity (Kg)	725.9	388.4	1583.1	1199.3	416.4	492.1
Capacity Physical Productivity (Kg/Length)	108.6	68.6	212.2	156.9	51.2	73.9
Power Physical Productivity (Kg/HP)	36.4	41.2	57.1	101	25.7	39.5
Per Vessel Day Physical Productivity (Kg/Day)	3.9	2.0	7.2	5.3	2.2	4.0
Man Physical Productivity (Kg/Man)	483.9	286.2	855.7	1139.3	257.8	445.2
Landing Prices (\$)	5.7	5.1	5.1	6.4	7.0	5.7
Man Productivity (\$/Man)	2,770.9	1,456.6	4,355.6	7,248.7	1,804.2	2,549.5
Invested Capital (\$)	88,817.5	20,518.4	94,289	40,241.4	75,234.0	25,099.2
Opportunity Cost (\$)	2,486.9	574.5	2,640.1	1,126.8	2,106.6	702.8
Capacity Productivity (\$/Lenght)	622.1	349	1,080.1	998.4	358.5	422.9
Vessel Productivity (\$)	4,156.4	1,976.9	8,057.8	7,630.2	2,914.4	3,346.2
Power Productivity (\$/HP)	208.6	209.7	290.6	642.9	179.8	226.4
Per Vessel Day Productivity (\$/Day)	22.5	10.3	36.8	34	15.7	22.6

Regarding vessel productivity and per vessel day productivity of small-scale fishing boats in fishery cooperatives covered in the study, Mordogan and Akyaka have relatively high values with a slight difference from each others. Marmaris and Foca follow them with almost the same results. Akcapinar and Karaburun have relatively lower values (table X, figures 19 and 21).

Power Productivity (\$/HP), is more than twice in Akyaka (642.9) compared to Akcapinar (290.6) and around triple compared to Marmaris (226.4), Karaburun (209.7), Foca (208.6), and Akcapinar (179.8). Table X provides overall results of socio-economic indicators in small-scale fishery.

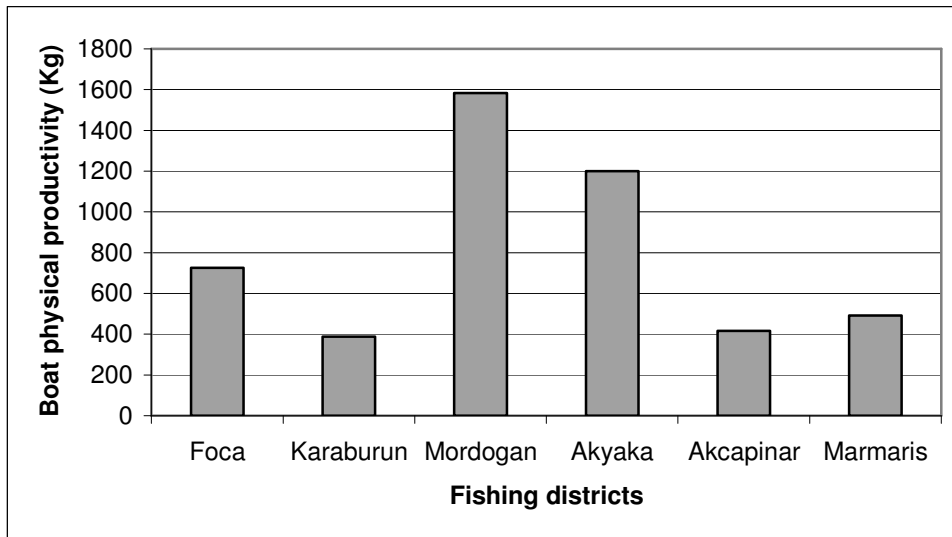


Figure 10: Comparison of vessel physical productivity of fishing districts.

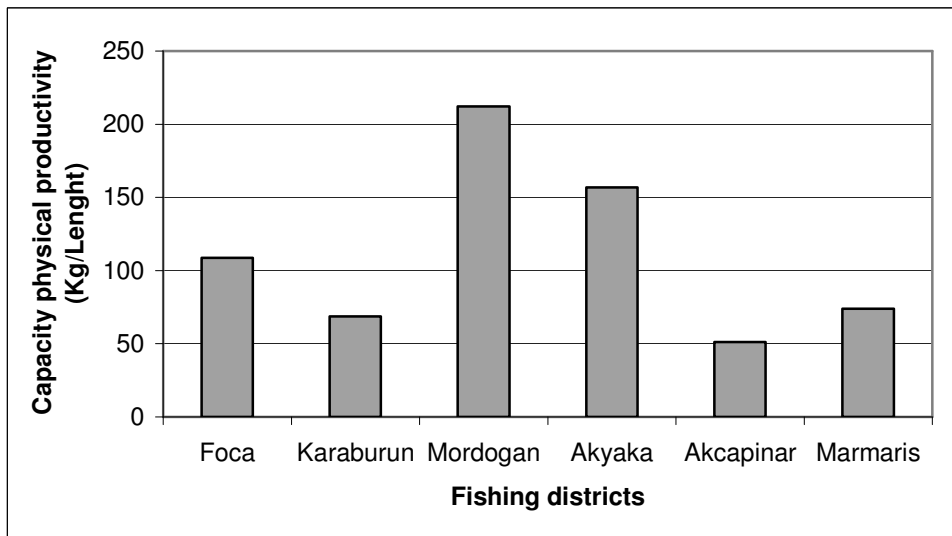


Figure 11: Comparison of capacity physical productivity of fishing districts.

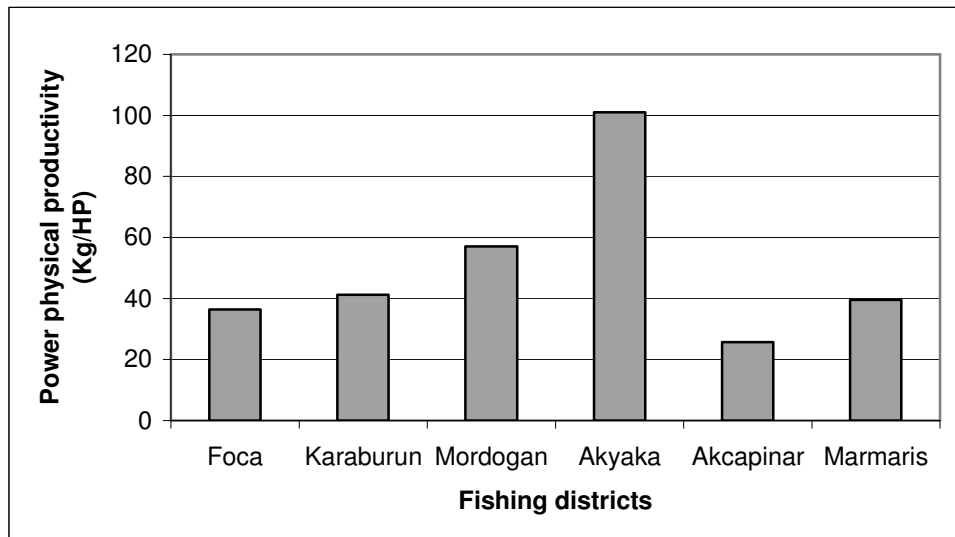


Figure 12: Comparison of power physical productivity of fishing districts.

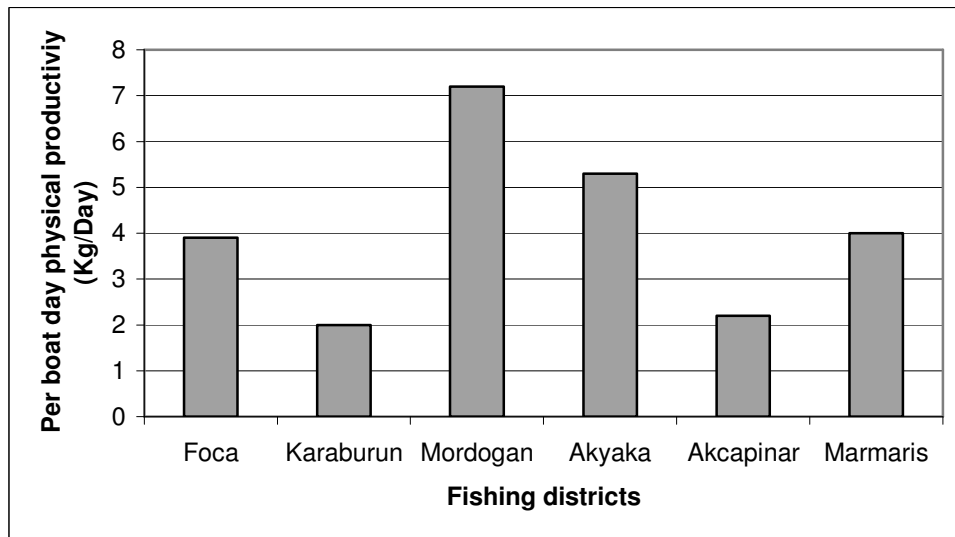


Figure 13: Comparison of per vessel day physical productivity of fishing districts.

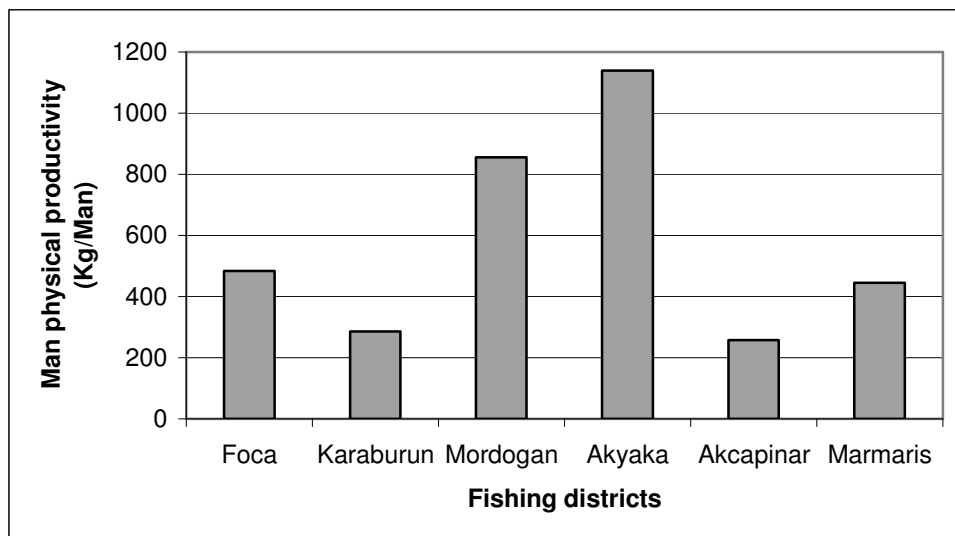


Figure 14: Comparison of man physical productivity of fishing districts.

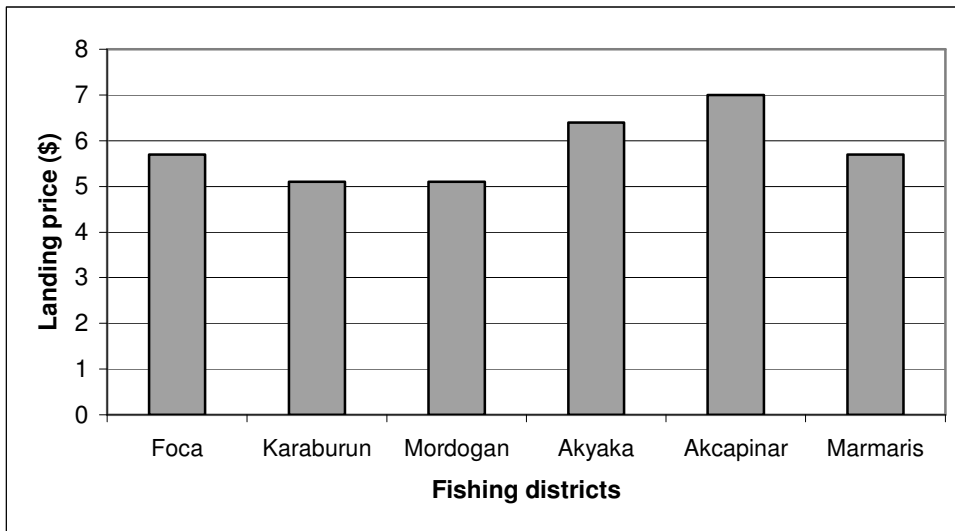


Figure 15: Comparison of landing price of fishing districts.

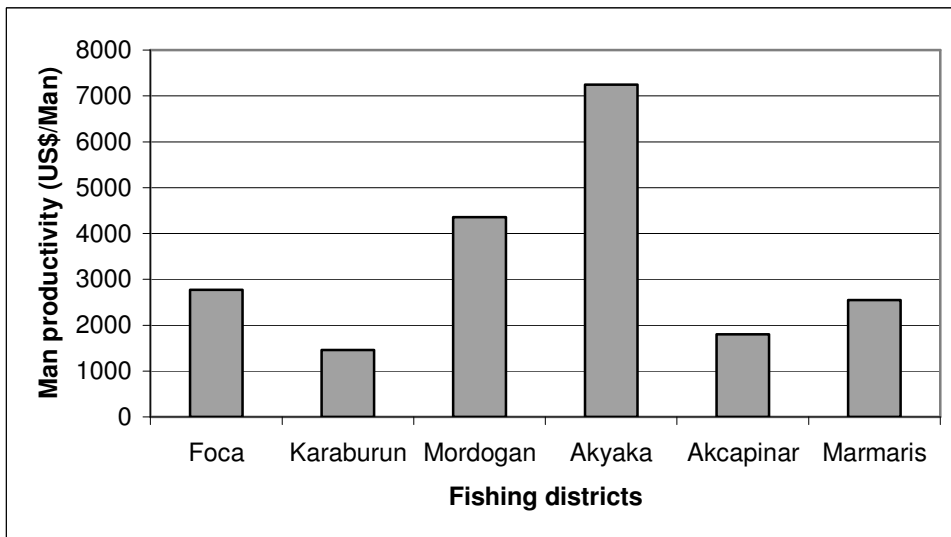


Figure 16: Comparison of man productivity of fishing districts.

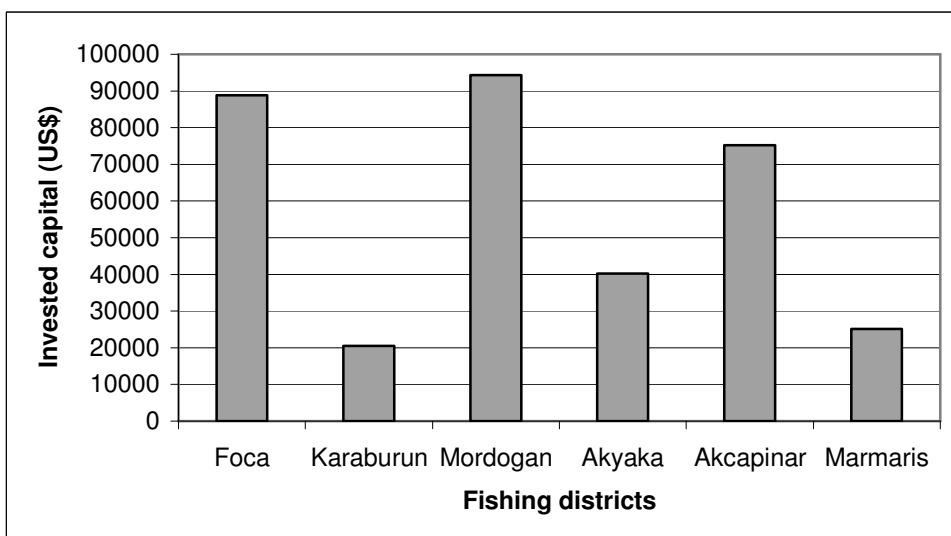


Figure 17: Comparison of invested capital of fishing districts.

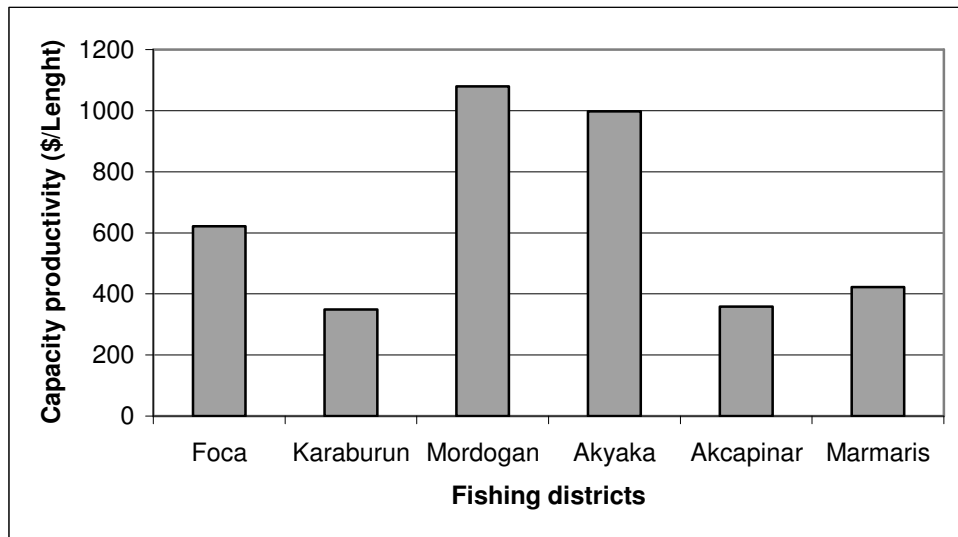


Figure 18: Comparison of capacity productivity of fishing districts.

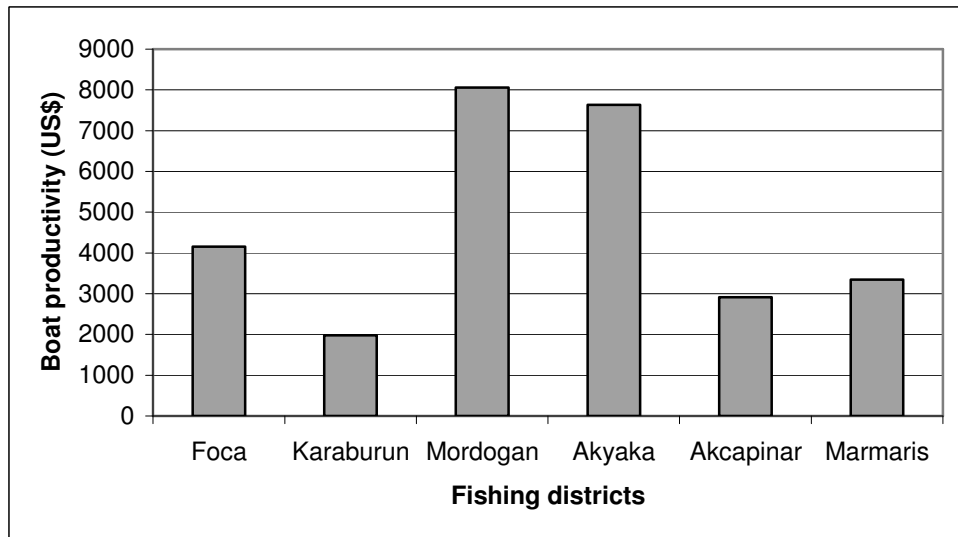


Figure 19: Comparison of vessel productivity of fishing districts.

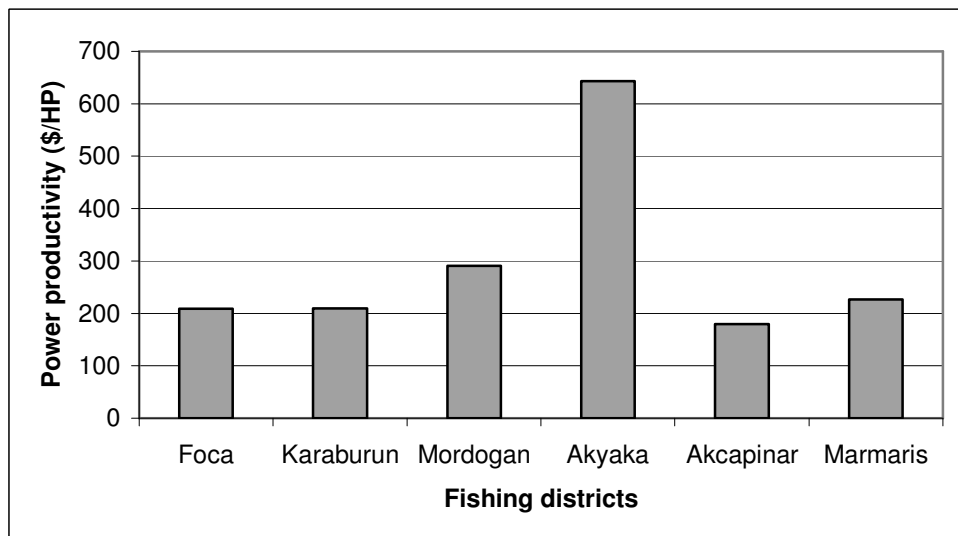


Figure 20: Comparison of power productivity of fishing districts.

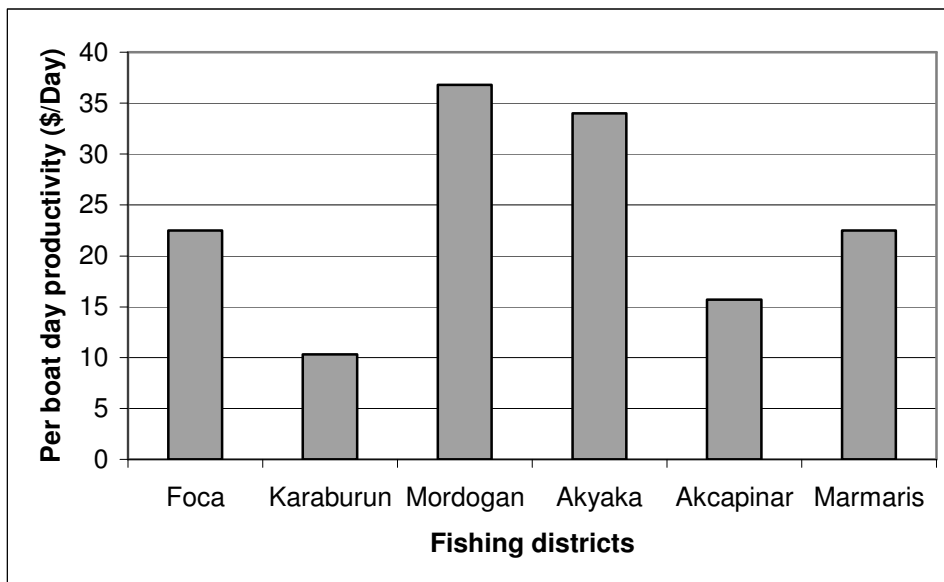


Figure 21: Comparison of per vessel day productivity of fishing districts.

4.3. Economic characteristics and viability of small-scale fishing vessels

4.3.1. Cost structure, daily share income and fishing efforts

In this section the cost structure of small scale fishing vessels in each cooperative was compared from the data collected during field studies. The different cost components of total costs, which include also cost of capital investment, are shown as percentages in table XI, and distribution of main cost components are shown in figure 22.

Table XI: Total costs components of small scale fishing vessels.

Distribution of total costs %	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Running cost	33.6	22.2	31.6	47.1	38.9	45.6
Labour cost	38.1	59.4	43.6	27.1	39.8	33.3
Vessel cost	19.7	11.9	15.4	19.3	12.3	14.3
Depreciation	6.0	4.7	6.5	5.1	6.6	5.2
Other cost	0.5	-	-	-	-	-
Opportunity cost	2.3	1.9	2.9	1.4	2.1	1.6

On the basis of interviews with skipper owners, running cost was the most important element followed by vessel costs. But after calculating labour costs even for vessel owners and family members, mean labour costs were found to be higher than running costs in Foca, Karaburun, Mordogan and Akcapinar. It should be considered that presently most of the skipper owners in small scale fishery do not prefer to work with crew(s) on their vessels. They usually use longline, gill net and lift net or both gill net and longline for the fishing operation. Because of decreasing catch per unit effort and income level in small scale fishery, skipper owners prefer to go fishing alone. Moreover, some of them have developed practical tools such as using longer tillers to ease fishing operation and some of them have bought a hauler to manage fishing operation alone. With this respect, recently, 72 percent of the small scale fishing vessels in Foca, 79 percent in Karaburun, 50 percent in Mordogan, 91 percent in Marmaris, and all in Akayaka and Akcapinar either had no crew or went fishing with one of the family members.

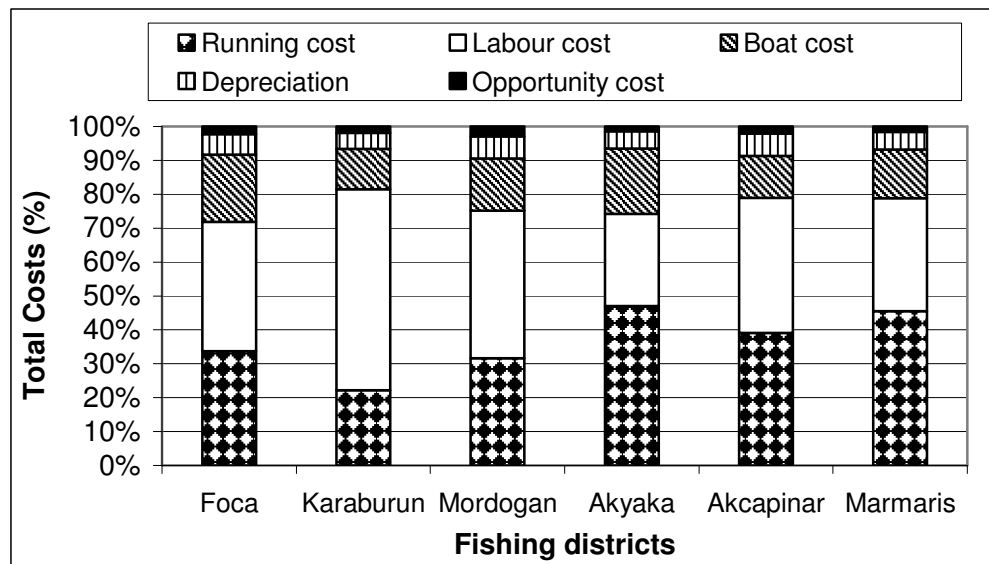


Figure 22: Total costs of small-scale fishing vessels in the study areas.

Regarding differences in their cost structure, it can be noted that small-scale fishing vessels operating on the south of Aegean coast have relatively higher running costs than fishing vessels operating in the central of Aegean coast. However small-scale fishery is more labour intensive in the central Aegean fishery cooperatives (figure 22).

When adding the costs of investment to vessel costs, vessel costs gain considerable importance. Although running costs are the most important cost elements of the total costs in southern small-scale fishing vessels, while labour costs are the most important element of small-scale fishing vessels in the central Aegean coast.

Table XII summarizes some operating characteristics such as the crew size, days at the sea, fishing days with no catch, and average running costs per day in each region. The number of household population and employed family members varied considerably among the vessels in the six fishery cooperatives. Running costs per vessel/fishing day was too low in Karaburun (2.5 US\$/fishing day), where fishing grounds were close to the fishing ports, and much higher in Akyaka (8.9 US\$/fishing day), Marmaris (8.5 US\$/fishing day) and Akcapinar (7.7 US\$/fishing day), where longline fishery is dominated fishery and bait costs were main component of the running costs.

Table XII: Some operational characteristics of small-scale fishing vessels.

Operational indicators	Foca Co-op	Karabun Co-op	Mordan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Crew Size (Min-Max) Mean±SD	(1-3) 1.5±0.6	(1-2) 1.4±0.5	(1-3) 1.9±0.7	(1-2) 1.1±0.2	(1-2) 1.6±0.5	(1-3) 1.3±0.6
Days at the sea (Min-Max) Mean±SD	(60-300) 184.7±7 5	(70-330) 192.1±8 4	(30-330) 219±73	(100-330) 224.2±5 8	(100-270) 185.6±46. 3	(50-250) 147.8±63. 7
Fishing days without catch (Min-Max) Mean±SD	(0-200) 29±38.6	(10-150) 57±40	(5-100) 40.4±27.5	(0-50) 11.4±15. 4	(2-50) 18.5±13.7	(2-50) 15.4±16.5
Running costs per fishing day (US\$) (Min-Max) Mean±SD	(2.1-27.8) 6.3±4.8	0.7-4.2 2.5±0.9	2.1-17.6 6.6±4.5	3.3-18.9 8.9±4.2	3.0-13.4 7.7±2.3	2.5-18.6 8.5±4.2
Per Vessel Day Share Income (\$/Day)	16.2	7.8	30.2	25.1	8.0	14.1

The crew size including skipper owner ranged from 1 to 3 persons per vessel and average days at the sea were about 192 day/year per vessel. Eventhough there were considerable days those fishermen caught no fish (it means those days there was loss-even operating income was negative), as an average there was still a difference between the running costs and gross income. This difference (share income) was maximum with 30.2 US\$ in Mordogan and 25.1 US\$ vessel/day in Akyaka but the least with 7.8 US\$ vessel/day in Karaburun. Fishing vessels in Akcapinar with 8 US\$ mean daily operating income are similar to Karaburun and Foca with 16.2 US\$ show similarity to Marmaris which has 14.1 US\$ per vessel day operational income (figure 23).

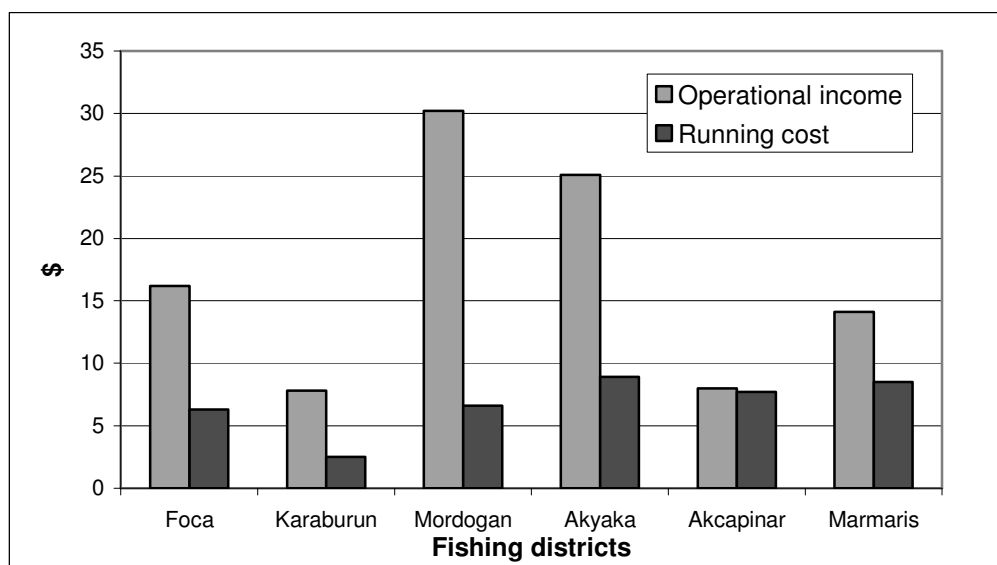


Figure 23: Comparison of running cost and share income in the study areas.

Concerning payments instead of wage or salary, sharing system is common amongst fishermen. Another method is partnership. This is quite common in Foca and Gokova Bay, where Akyaka and Akcapinar are located, and seems to be expanding but partnership does not regularly happen. Skipper owners face some difficulties in finding crew who accepts to work with share system. Because of high running costs and low share, crews do not want to work in sharing system. However, skipper owners do not desire to pay wage because of uncertainty in fishery. Therefore, they go fishing alone or together with a family member or rarely with another vessel owner.

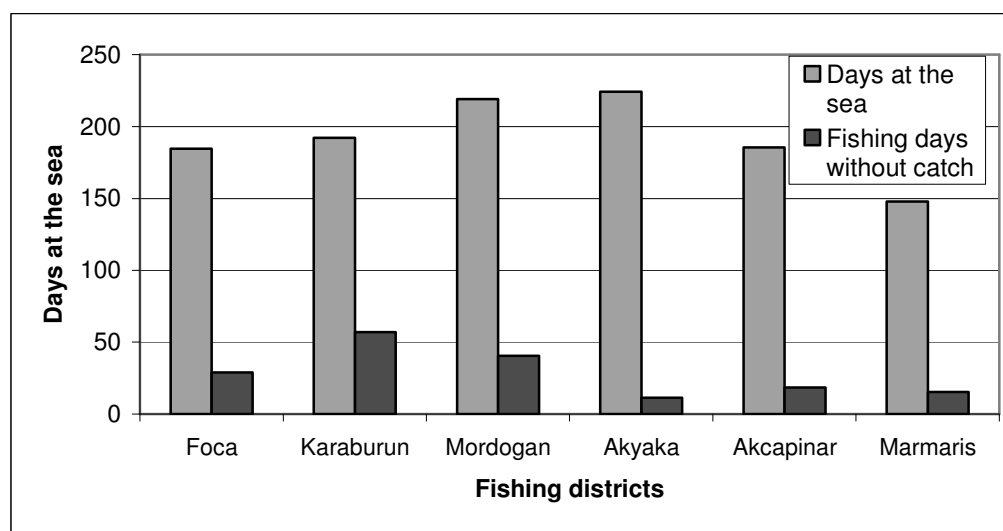


Figure 24: Comparison of number of days at the sea and fishing days with no catch.

4.3.2. Market structure

Small-scale fishermen sell their catch mostly at the local market, where there is always a strong demand for fresh fish. Direct consumption is common among households and restaurants. Therefore, most of the fish are sold directly to households and restaurants in small scale fishery. On the other hand, almost all of the catches taken by trawl and purse seine fishery are sent to the central fish markets such as “Izmir Central Fish Market”, and usually sold for relatively cheaper price. Small-scale fishermen are usually pleased that their catches do not have to compete with these relatively higher amounts of low priced fish captured by trawlers and purse seiners. In addition, due to preciousness of the species in the region and extra demand created by tourism sector, the prices of fish are quite high and the marketing channel is very short since products are directly sold from producer to consumer in inshore fishery.

In Foca, most fishermen sell their catch through auction, run by Foca Municipality and where the price is set. Fishmongers join the auction as well as households and restaurants’ owners. Since the auction is directed by not the fishery cooperative, the prices are usually set to the advantage of the consumers, mainly restaurant owners. Fish market is controlled by a group of local restaurants owners who have monopolized the market and prevent the cooperative auction.

In contrast to Foca, there is no auction in Karaburun and Mordogan. Fishermen usually sell their catch to restaurants, fishmongers or consumers. If they have enough catch and prices are relatively low, a few of them come together and send their catch to Guzelbahce or Izmir fish market. There is no fish auction in Akyaka, Akcapinar and Marmaris, but each of the cooperative has marketing facility inside the cooperative building and one person is employed and responsible for selling fish. Comparing with

Foca, Akyaka, Akcapinar and Marmaris, fish demand in local market is not at satisfactory level in Karaburun and Mordogan.

Gokova Bay, where Akayaka and Akcapinar Fishery Cooperatives are located, and Marmaris Bay, where the Marmaris Fishery Cooperative is located, are well known districts for both national and international tourists. Therefore, fish price of these three cooperatives are relatively higher, especially during the summer time. Marketing channel is very short and consumers can reach daily fresh fish directly through cooperatives.

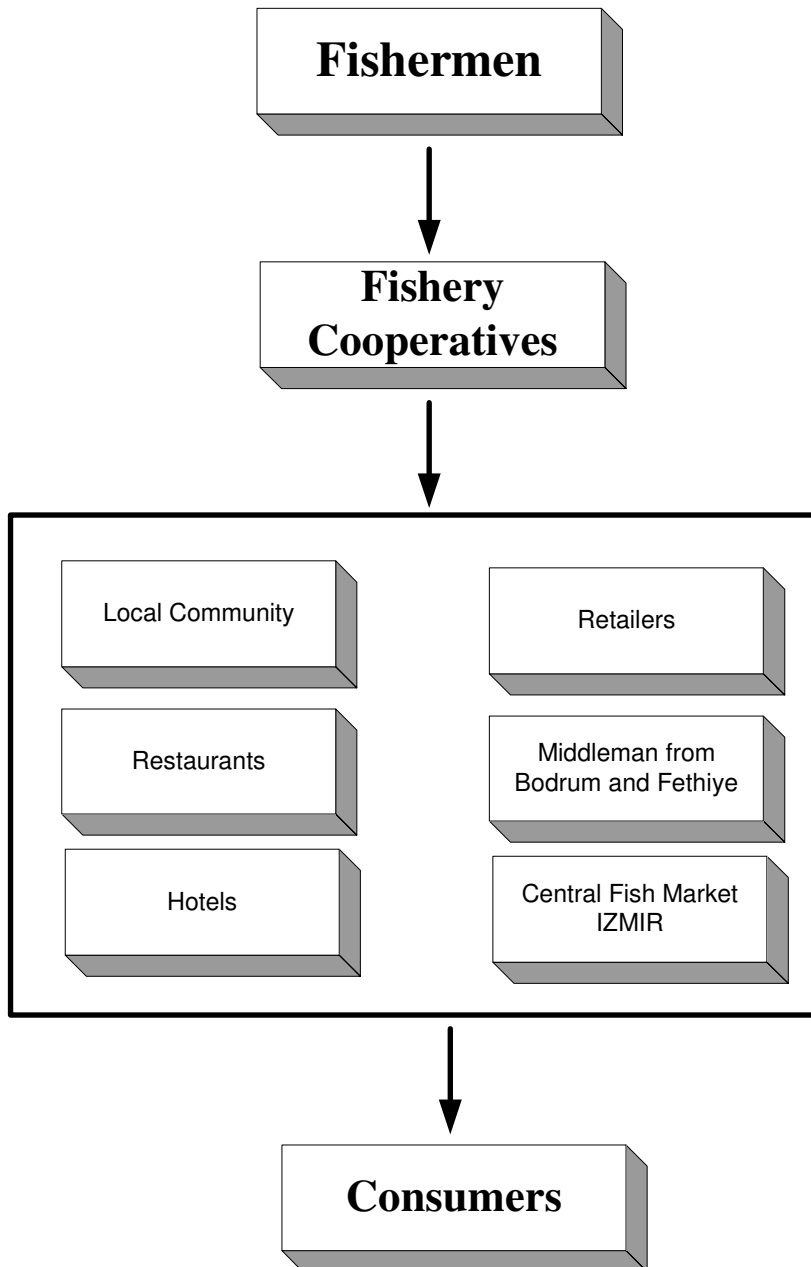


Figure 25: Marketing channel of small-scale fishery in the south Aegean coast.

In the region, cooperatives market almost 70 percent of total fish catch. Use of cooperatives is greatest (all fishermen) in Akcapinar Fishery Cooperative and 80 percent in Akayaka Fishery Cooperative, while it is the least in Marmaris Fishery Cooperative with 20 percent.

In the six fishing districts, catch is not only sold by fishery cooperatives, but also by fishermen, especially non cooperative members sell their catch to middleman, restaurant owners or directly from vessel to local community due to better price, providing help (such as loans, fishing gear etc), guarantee to sell fish, and friendship. Some of them

also mention that it is better to sell their catch to whomever they wish rather than only to the fishery cooperative.

4.3.3. Economic and financial performance of fishing fleet

Among the small-scale fishing vessels in the six cooperatives, only 68 of them achieve satisfactory financial and economic results. Remaining 59 vessels, out of 127 covered in this study show negative economic results after deducting costs related to depreciation and interest. Amongst the vessels with negative economic results, however, 3 still have positive gross cash flow (GCF) and only 4 vessels (3 percent) suffer operational losses. Table XII shows all fishing districts generate positive share income for the small-scale fishery. However, in terms of average GCF and net profit (NP) or in other words net cash flow (NCF), small scale fishery in Foca, Mordogan, Akyaka, and Marmaris have positive economic results but Karaburun and Akcapinar have losses. Table XIII shows annual earnings, costs, gross cash flows and profits/losses of small scale fishing vessels in study areas.

Table XIII: Gross and net cash flow of small-scale fishing vessels (in US\$).

Economic Performance	Foca Co-op	Karaburn Co-op	Mordogn Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Total landing value	133,011	27,677.5	161,165.8	144,982.4	75,779.1	53,541.6
Running costs	36,941.9	6,691.2	28,763.7	37,918.2	37,357.0	20,074.8
Labour costs	41,900.6	17,940.1	39,700.4	21,808.6	38,201.3	14,671.2
Vessel costs	21,636.2	3,582.2	14,061.4	15,512.1	11,796.3	6,286.3
Other costs	559.9	0	0	0	0	0
Gross cash flow	31,9731	-536.0	78,640.3	69,743.5	-11,575.5	12,509.3
Depreciation	6,558.0	1,417.3	5,899.1	4,116.8	6,401.6	2,267.8
Imputed Oportunity Cost	2,487.0	574,5	2,640.2	1,126.8	2,106.7	702.8
Net Cash Flow	22,928.1	-2,527.8	70,101.0	64,499.9	-20,083.8	9,538.7

Percentages of negative NCF for each of the cooperative are 56 percent in Foca, 57 percent in Karaburun, 15 percent in Mordogan, 16 percent in Akyaka, 73 percent in Akcapinar, and 50 percent in Marmaris. Results are almost the same for the vessels show negative GCF. There are slight changes in Akcapinar and Marmaris where percentages of small-scale fishing vessels are 65 percent and 44 percent, respectively. Four of the six cooperatives show positive NCF (Mordogan and Akyaka show very clear NCF) and other two, Karaburun and Akcapinar show negative NCF as shown in figure 26.

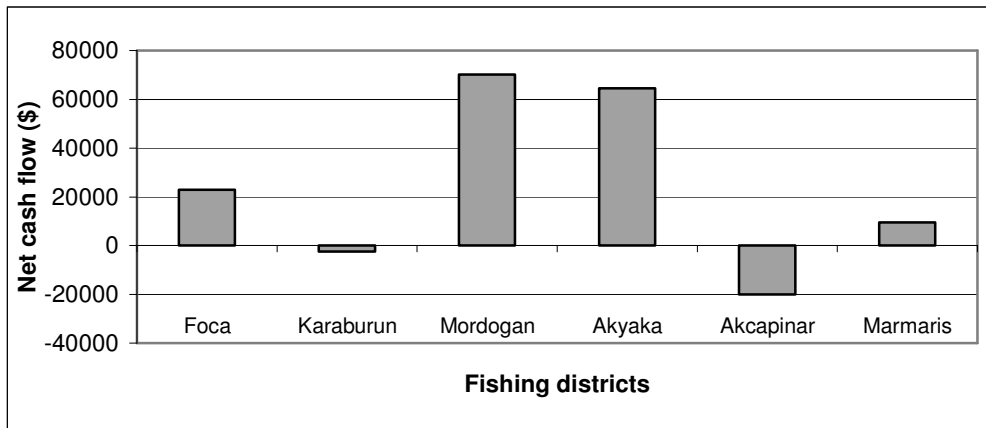


Figure 26: Comparison of net cash flow of small-scale fishing vessels.

In terms of economic and financial performance, which is also called return on investment (ROI), fishing vessels from two fishing cooperatives, Karaburun and Akcapinar, show negative results. Economic performance in Karaburun is -9 percent while it is -26 percent in Akcapinar and ROIs are -12 percent in Karaburun and -27 percent in Akcapinar. However, fishing vessels from Mordogan and Akyaka have very good and close economic performance but fishing vessels in Akyaka have rather distinctive financial performance, because of their low investment and labour costs. These vessels use gillnets and traditional longlines and catch high-value species such as *Mullus surmuletus*, *Mullus barbatus*, *Epinephelus aeneus*, *Pagellus erythrinus*, *Sparus aurata*, and *Diplodus vulgaris*. Figure 27 shows comparison of these two performance characteristics of small-scale fishing vessels in selected fishing cooperatives. Furthermore, economic performance and ROI, and ratio of total costs in total earnings, are shown in Table XIV.

Table XIV: Economic/financial results of small-scale fishing vessels.

Small-scale fishing vessels in selected fishery cooperatives	NP / TE (%)	ROI (%)	TC / TE (%)
Foca	17.2	25.8	82.8
Karaburun	-9	-12	109
Mordogan	43.5	74.3	56.5
Akyaka	44.5	160	55.5
Akcapinar	-26	-27	127
Marmaris	17.8	38	82.2

When comparing TC/TE ratios in different fishing districts, it is observed that small-scale fishing vessels in Akcapinar have the highest ratio followed by those in Karaburun. Fishing vessels in Foca and Marmaris have almost the same TC/TE ratios; 82.8 and 82.2 as well as NP/TE ratios; 17.2 and 17.8, respectively.

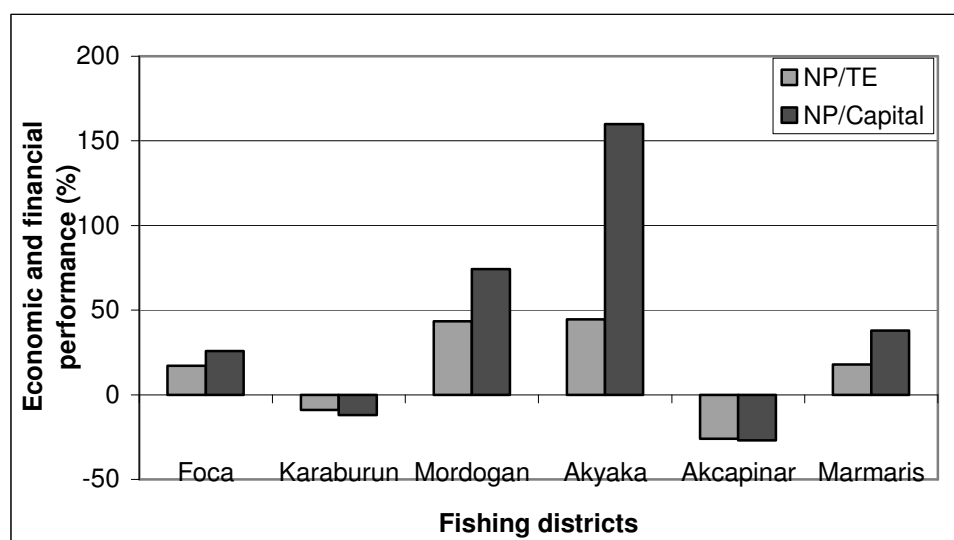


Figure 27: Comparison of economic/financial performance of small-scale fishing vessels in selected fishing districts.

4.4. Fisherman organizations: Co-operatives

4.4.1. History and present status of fishery cooperatives

Co-operatives started out as small grassroots organizations in Western Europe, North America and Japan in the middle of the last century. However, it is the Rochdale Pioneers that is regarded as the prototype of the modern co-operative society and the founders of the Co-operative Movement. In 1844, a group of 28 artisans working in the cotton mills in the town of Rochdale, in the north of England established the first modern co-operative business, the Rochdale Equitable Pioneers Society. The weavers faced miserable working conditions and low wages, and they could not afford the high prices of food and household goods. They decided that by pooling their scarce resources and working together they could access basic goods at a lower price. Initially, there were only four items for sale: flour, oatmeal, sugar and butter. The Pioneers decided it was time shoppers were treated with honesty, openness and respect, that they should be able to share in the profits that their custom contributed to and that they should have a democratic right to have a say in the business. Every customer of the shop became a member and so had a true stake in the business. At first the co-op was open for only two nights a week, but within three months, business had grown so much that it was open five days a week. The principles that underpinned their way of doing business are still accepted today as the foundations upon which all co-operatives operate. These principles have been revised and updated, but remain essentially the same as those practiced in 1844 (ICA, 2005). In addition, fishermen have been using similar organizations for a long time to regulate fishing rights. Franquesa (2004) reported that fishermen guilds in Spain have long history (around one thousand years) and they played a central role in the control of fishing rights especially in the context of coastal fisheries.

First fishery cooperative was established in 1913 in India namely “Karla Machhimar Cooperativa Society” followed by second cooperative founded in 1918 in West Bengal and another in Tamil Nadu. Women play important role in fishery cooperatives in India and cooperatives seem to be an effective tool for improvement of poor people’ conditions. However, present law is far from supporting development of fishery cooperatives (Mishra, 1997). International Cooperative Alliance (ICA) (1995) reported that in India in 1995 exist over 9,300 fishery cooperatives with a membership of 956,100 individuals regrouped in the National Federation of Fishermen’s Cooperatives. It is estimated that 11 percent of all fishermen in India are organized into cooperatives.

Fishery Cooperatives in Japan have highly developed network and the cooperatives support their members regarding price, various inputs, and education. The Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF) (MAFF, 2003) reported that there are 238,000 fishermen and 3,382 fishery cooperatives in Japan. These cooperatives are organized under the National Federation of Fishery Cooperative Associations (ZENGYOREN). Fishery cooperatives dominate 70 percent of the fish market in Japan. They have special fishing rights and play important role on fisheries management. Japanese Government delivers financial aids to the fishery cooperatives. Therefore, almost all fishermen are member of these cooperatives in Japan.

In Nicaragua, artisanal fishery cooperatives regrouped in a federation with 65 cooperatives were responsible for 60 percent of fishery exports for a value of nearly 40 million US\$ (ICA, 1995).

In Canada, fishery cooperatives regrouped nearly 10,000 individuals in over 55 fishery cooperatives. These accounted for 8 percent of the market share of fisheries products in 1992. Fish marketing by fishery cooperatives reached nearly 190 million Canadian dollars (ICA, 1995).

About 30.000 cooperative enterprises, almost 9.000.000 farmer and fishermen were organized under the General Confederation of Agricultural Co-operatives in the European Union (COGECA). COGECA, which was established in 1959 in the Netherlands, reached to over 600,000 persons employed, about 210 billion Euro turnovers, over 50 percent of shares in the supply of agricultural inputs, and over 60 percent shares in the collection, processing and marketing in the agricultural products (COGECA, 2005).

In Turkey, Mithat Pasha started the first cooperative movement with agricultural credit in 1863, during the time of Ottoman Empire. Kocabas (2003) reported that the first movement started by Mithat Pasha developed intellectually as well as practically during the Constitutional Period (1908-1918), and early period of the Republic of Turkey (1923-1960). In addition to this, after foundation of the Republic of Turkey cooperation was supported by Turkish Government. According to Mulayim (2000), the first president of the Republic of Turkey, Mustafa Kemal ATATÜRK was the pioneer of cooperation in Turkey. He was also the first member and founder of a consumption cooperative in Ankara in 1925 and an agriculture credit cooperative in Icel.

When looking at the historical development of the Turkish fisheries cooperatives, it can be seen that it is not very old and strong. In Turkish fisheries, the first cooperative movement was started in 1942 with leadership of Halk Bank (Kocel, 1971; Arisoy, 1974). The Ministry of Trade and the Halk Bank prepared a work plan to develop fisheries in Turkey in 1942.

With this programme, responsibilities regarding organization of credits, production, marketing, construction of cold storages, construction of fish industry and fish oil factories were given to the Halk Bank. Therefore, provisions of fisheries credits were firstly carried out by the Halk Bank. Nevertheless, the Halk Bank could not cope with the Istanbul Fishers Organization, which was managed by 5-6 fish mongers, and this mission was transferred to Ziraat Bank. Thus, fisheries cooperatives working in the areas of fisheries, aquaculture and sponge capture and established according to Law No 1163 could benefit from the bank credits (Hazar, 1990).

Different authors give different information about the first fishery cooperative in Turkey (Knudsen, 1998). While some sources claim that the first fisheries cooperative was "Istanbul Fish Producers Association" established in 1949, Hazar (1990) reports that the first cooperative regarding to fisheries was founded in Istanbul on 11.02.1943 and its name was "Fishers Production, Credit, Operation and Marketing Cooperative". In any case, it

needs to be stressed that the first fisheries cooperative appeared approximately 70-80 years after the establishment of the first cooperative movement in Turkey.

Cakiroglu (1969, as cited in Knudsen (1998)) reports that cooperative movements were concentrated in 1950s, and technical and economic assistance promises of the Marshall Plan to fishers organized under cooperatives are believed to be influential in that movement.

In addition, Knudsen (2001) reports that Evliya Celebi mentioned in his travel book (*Seyehatname*) that fishers guilds existed in Istanbul in the 17th century and these guilds were expert in operating fishing gears such as set nets, seines, harpoons, pots, and drop nets and some of them were expert in oyster capture.

Although there were a great deal of development in agricultural cooperatives, relatively less progress were made in fisheries cooperatives and there has been considerable development on agricultural cooperatives but fisheries cooperatives have witnessed very limited development. There is insufficient information available to the interested public. The academic and technical literature on the subject is limited, and they provide little knowledge and evidence about fishery cooperatives.

Although fisheries cooperatives in Turkey were classified under agricultural cooperatives (Cikin ve Kızıldağ, 1997; MARA, 1997), studies on agricultural cooperatives either do not mention fisheries or give only brief information about them.

Arisoy (1974a) presented the negative results of the Turkish fisheries cooperatives in their first 31 years of practice between 1942 and 1973, and reported an urgent need for reformation in Turkish Fishery Cooperatives.

Cakiroglu (1969, as cited in Knudsen (1998)) reported that the attempts to establish fishery cooperatives in 1950 were not successful, and first serious step to develop fisheries cooperatives were taken by the authorities of the Ministry of Commerce who activated 15 inactive cooperatives on the eastern Black Sea coast and convinced them to establish the Associations of the Black Sea Fisheries Cooperatives in 1968.

Berkes (1986), who examined five fishery cooperatives in Turkey, mentioned that these cooperatives were selected on the basis of whether they were clearly “successful” or “unsuccessful” in fisheries. The success or lack thereof is defined in terms of evidence for overfishing and overcapitalization which are indicators of the sustainability and the efficiency of the fishery. He found that the Ayvalik-Haylazli Fishery Cooperative and the Tasucu Fishery Cooperative were successful, but in contrast with these two case studies, the Bodrum Fishery Cooperative, the Alanya Fishery Cooperative and the Izmir Fishery Cooperative neither have the legal authority nor the economic power to gather all of the fishermen under their umbrellas.

Cikin and Elbek (1991) evaluated the agricultural and fisheries cooperatives both in scales of European Union and Turkey, and stressed the need for a management body that can establish the policies which would accept cooperative management as a tool in the solution of the problems of fisheries sector.

Knudsen (1998), examined that how fishery cooperatives play role in Turkish Black Sea fishery sector and mentioned these cooperatives as “an insistent ideal”, however, pointed out that establishment of the fisheries cooperatives was not born out of cooperation desire of people, but product of a conscious organization effort of state bureaucracy from top to bottom.

It is very important that MARA published a report on development strategies of Turkish fisheries sector, and in this report, MARA (2000), states the need for change in Turkish Cooperatives Law (No. 1163) and need for an increase in the efficiency of the

cooperatives, however absence of any changes in last five years period reflects the importance of the fisheries cooperatives and official look towards cooperatives.

Kocabas (2002; 2003) investigated the evolution of the idea of cooperatives and agricultural cooperatives in Turkey, nevertheless, did not mention the fisheries cooperatives as many others.

Ünal (2004a) stressed the importance of the fisheries cooperatives for fishers, fish resources and fisheries managers.

In 1980, there were 229 fishery cooperatives with 14,750 members in Turkey, and 96 of these cooperatives were on the sea coast (Hazar, 1990). In 1992, while there were 8,020 agricultural cooperatives, only 262 fishery cooperatives existed in Turkey (Cikin and Kızıldağ, 1997). Both number of cooperatives and members have increased in 2003. According to MARA (2005), there are 413 fishery cooperatives with a total of 21,719 members and 8 fishery cooperatives associations with 78 member cooperatives and 1 central union of fishery cooperatives associations.

International Cooperative Alliance (ICA) (1995) defined fishery cooperatives as institutions that bring people involved in the fishery sector together, whether they are involved in actual capture, processing, and marketing. Fishery cooperatives generally have three main objectives all focusing on the development of the industry and well-being of fisher folk communities. They aim increasing income, improving the standard of living and increasing the supply of food to their communities and nations. Fisherfolk and persons involved in the fishery sector can increase capture, improve processing and marketing of fish products when they unite in a cooperative. Individuals, who alone would find it difficult to maintain their livelihoods, pool their human and financial resources to enable them to make their operations viable. Equipment and fishery inputs can be purchased, loans can be sought, insurance cover can be obtained, operating expenses can be rationalized, fish capture efficiency can be increased by education and training especially as regard to fishery resource management, exploitative situations can be countered, all enabling more secure captures. Cooperatives in this way contribute to food security by allowing fisherfolk not only to provide food for them, but also make high quality protein available to their communities.

Importance of fishery cooperatives in fishery sector and improvement of socio economic conditions of fishermen are very clear in ICA's definition but in Turkey even though functions and objectives of fishery cooperatives are well defined by MARA and Cooperative Law no 1163, there is still no particular unit for the fishery cooperatives under the MARA. The General Directorate for Organization and Support provides service for the fishery cooperatives within the framework of Law no 1163 on cooperatives. Nevertheless, these efforts are quite far to meet expectation from MARA.

4.4.2. Characteristics and problems of selected fishery cooperatives

The six fishing districts and fishery cooperatives in this study were selected on the basis of geographical location; three from central Aegean coast (Foca, Karaburun, Mordogan) and three from south Aegean coast (Akyaka, Akcapinar and Marmaris).

Foca, where fishery cooperative exists, is a region with a population of approximately 14,000 inhabitants located at the Central Turkish Aegean. Domestic tourism, farming and fishing are the main sources of livelihood. The town is also well known as the first Mediterranean monk seal (*Monachus monachus*) protection area in Turkey, and SAD-AFAG has been carrying out projects for conservation of this critically endangered species since 1993 (Güclüsoy and Savas, 2003). The fishery in Foca which targets various economic species uses a variety of gears such as trawls, gillnets, lift nets,

longlines. In terms of volume of catch, number of vessels, and fishing grounds, Foca is one of the leading fishing districts in the region (figure 28).

Foca Fishery Cooperative was founded in 1992. All fishermen in the region are not cooperative members, and also all cooperative members are not active fishermen. The number of registered fishermen (vessel owner) in Foca is 336 and 37 percent of the registered fishermen are cooperative members (table XVI).

Karaburun is a region with a population of approximately 9,000 (including all villages) inhabitants and is located in Central Turkish Aegean (figure 28). The main source of income is agriculture. Small-scale fisheries using multi-gears such as gillnets, lift nets, longlines, exist in Karaburun but play very minor role in the local economy. The Karaburun Fishery Cooperative was founded in 1999. Presently, it has 31 registered members (table XVI).

Mordogan is located at 80 km away from Izmir metropolitan (figure 28) and the main source of income derives from farming, domestic tourism and fishery. Fishery is characterized a multi-gear such as trawls, gillnets, lift nets, longlines and multi-species fishery. The Mordogan Fishery Cooperative was founded in 1993. It has 40 members (table XVI).

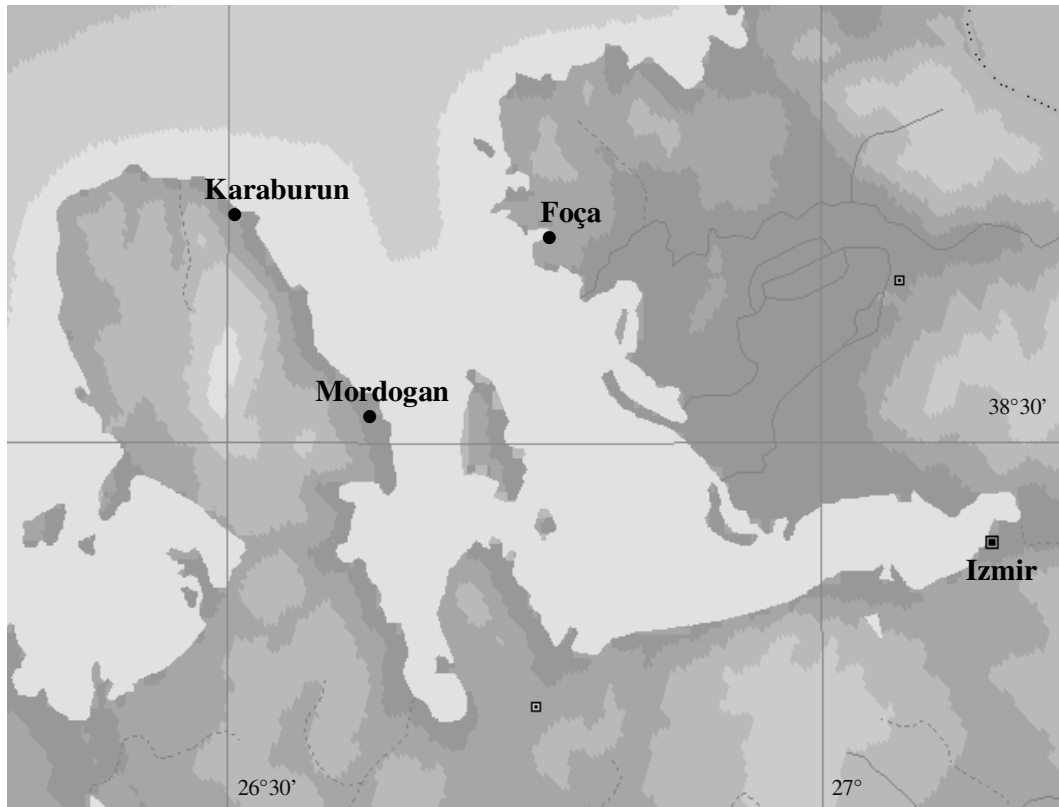


Figure 28: Location of central Aegean coast cooperatives and fishing areas.

Akyaka is a district with a population of approximately 2,193 inhabitants located at southern Turkish Aegean (figure 29), at the eastern end of the Gokova Gulf. Population considerably increases during the summer time.

Being a settlement even in antique times the village of Akyaka lead an existence as fishing village. It is known that the area is inhabited for about 2600 years. Akyaka is situated in the northwest of the Gokova gulf, 28 km away from Mugla and 32 km away from Marmaris. In the year 1988, the region was declared as the first “Nature Protected Area (SPA-Special Protected Area) of Turkey (Bildirici 2005).

Due to legal reasons, The Akyaka Fishery Cooperative was founded in 1992 almost 20 years after establishment of the Akcapinar Fishery Cooperative. It is an active fishery cooperative in the region and has 26 members, but all fishermen in the willage are not cooperative members (Table XVI). Gillnet and longline fisheries are dominated small-scale fishery. *Epinephelus aeneus* is the most important and target species of the region.

Akcapinar is a region with a population of approximately 516 inhabitants. It is located on southern Turkish Aegean coast where the Gokova Gulf meets the land, 42 km away from province of Mugla. Fishing is the main economic activity together agriculture and tourism in the village. They share fishing grounds with the Akayaka Fishery Cooperative and hire the fishing ground together since 1992 (figure 29). This Fishery Cooperative was founded in 1973. All fishermen in the region are cooperative members. Registered fishermen (vessel owners) in Akcapinar are 26, and all of them are also active fishermen (table XVI).

Marmaris is situated at the meeting point of Aegean and Mediterranean Seas (figure 29). Tourism dominating the local economy but fishery still keeps its importance for both local fishers and tourism sector as well. The Marmaris Fishery Cooperative was founded in 1974. Registered fishermen in Marmaris are about 350 and only 35 of them are cooperative members (table XVI). They operate 30 small-scale fishing vessels. Membership rate of the cooperative is the lowest (9 percent) compared to other five cooperatives due to price policy and relatively high deduction of the cooperative. There are too many unlicensed part-time and sport fishermen, in the region. Besides, there is always an increasing demand to fish because of the highly developed tourism sector, numbers of hotels, restaurants, and blue voyage charter vessels. In other words, fishermen do not need cooperative to sell their fish. Cooperative is rather active on bureaucratic topics and also has one fish marketing shop in the central fish market of the town.

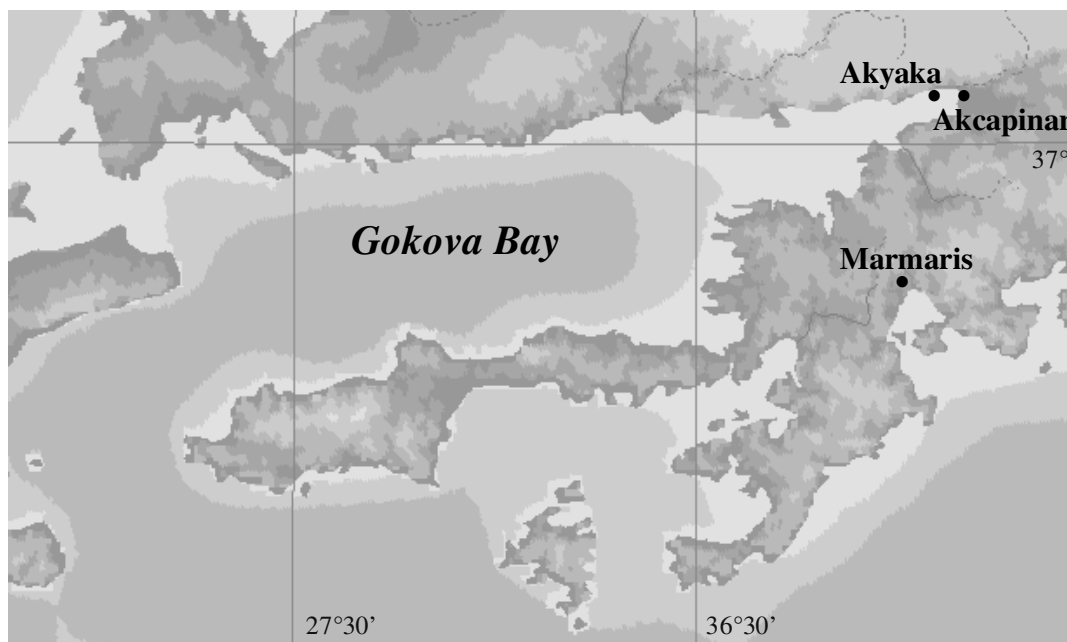


Figure 29: Location of south Aegean cooperatives and fishing areas.

In the study area, while several characteristics of the fishery cooperatives surveyed were common, several characteristics distinguish cooperatives from each others. Some of these features are their function and concentration, membership rate, rate of active members, group size, and years in fishery.

The oldest cooperative surveyed was founded in 1973 (The Akcapinar Fishery Cooperative) and the most recent in 1999 (The Karaburun Fishery Cooperative). The remaining cooperatives were established after 1990. All cooperatives follow the one-member-one-vote principle. Membership is not strictly restricted to fishers. Almost all cooperatives have a few members who are actually not fishermen, but all directors are member-fishers except the director of the Karaburun Fishery Cooperative. On the other hand, none of the cooperatives hired professional manager.

Foca, Karaburun and Mordogan Fishery Cooperatives do not have marketing facilities. The other cooperatives, located at the southern Aegean Sea coast, market fishers' products and provide few supplies and services to fishers. None of the cooperatives specialize in only one of these functions. Cooperatives which have marketing facility have one employee but none of them has an hired professional manager. Membership rate and rate of active fishers are highest in Akcapinar. In Foca, rate of active member is the least with 40 percent, and in Marmaris membership rate is the least with 9 percent. Karaburun and Mordogan Fishery Cooperatives do not have any employees while the others have one or two employees.

Whole fish are marketed in fresh form, primarily to local habitants and local restaurant/hotel owners. Marketing generated 99 percent (the rest is membership fee which is symbolic) of cooperative revenue and was the only business activity for 3 cooperatives examined in this study. Mordogan and Karaburun Fishery Cooperatives do not have any income source to carry on their activities except annual membership fees. However, Foca Fishery Cooperative hired fishing port and provides some facilities in port to its members as well as non-members and all fishermen who keep his vessels in the port pay annual rent to the cooperative. None of the cooperatives in the study area returned patronage refund to its members.

Foca Fishery Cooperative is one of the most active cooperative in the region, espically on combating with illegal fishery, but it is neither marketing nor supplies and service cooperative. It hires and runs the fishing port, establishes collaboration with non governmental fishing organizations such as SAD-AFAG to develop sustainable fishery and to improve fishermen conditions. The cooperative, Foca Agenda 21, Foca Municipality, and SAD-AFAG together organise a Fishing Festival named *Rastgele* every year in Foca to develop public relation, to establish a discussion platform among stakeholders, encourage fishers and support sustainable fishery in the region.

Mordogan is the least effective one amongst the six studied cooperatives. The head of the cooperative is also active local fishermen but not adequately active for the topics related to cooperatives. Compared to those in other five cases, the Mordogan Cooperative has the most powerful fleet and the second largest registered members after Foca. About half of the fishermen in Mordogan are member of the cooperative. However, the cooperative neither has marketing nor supply service for its members.

Major activities of the selected fishery cooperatives are marketing fish, providing supplies and service, hiring fishing port, lobbying services, and informing members about the latest regulations on fishing.

Table XV summarizes several descriptive characteristics such as foundation years, number of registered members, non-cooperative members, and rate of membership of the studied fishery cooperatives.

Table XV: Characteristics of fishery cooperatives in the study area.

General characteristics of cooperatives	Foca Co-op	Karabur Co-op	Mordog Co-op	Akyaka Co-op*	Akcapinar Co-op*	Marms Co-op
Foundation	1992	1999	1993	1992	1973	1974
Coast Line (approx. km)	35	15	35	85	85	210
Major activities	Runing port, Lobbying service	Lobbying service	Lobbying service	Marketing Supply and service	Marketing Supply and service	Marketing
Number of registered member	126	34	40	28	26	35
Active Members	51	18	27	24	26	30
Rate of active members (%)	40	53	67	86	100	86
Membership rate (%)**	51	75	55	37	100	9
Number of employees	1	0	0	2	2	2

*Both cooperative use the same fishing ground and the coastline

**It is calculated by rate of registered member in all fishermen in the region

Directors of all the cooperatives complain about government policies on fishery cooperatives and conservation and control service. Limited financial source and lack of solidarity are also main problems that fishery cooperatives agree. The southern Aegean cooperatives, which market fish, also declared that present tax system encourages the non-cooperative members, and under reporting.

Looking at general problems of cooperative members, 57 percent of fishermen complain about lack of subsidy, difficulties with having credits and high interest rates. 53 percent of fishermen declared problems regarding fishing grounds, and 50 percent with other fishermen. 20 percent of them stated problems with coast guard, 18 percent with local administration, 10 percent with crews and 9 percent with cooperative (this is 30 percent among the Mordogan Fishery Cooperative).

According to leaders of six selected fishery cooperatives, main problems of the cooperatives are shown in table XVI.

Table XVI: Main problems of the selected fishery cooperatives in Turkey.

Problems of cooperatives	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Tax system				X	X	X
Illegal fishing				X	X	
Conflicts among fishermen				X		
Lack of marketing facilities	X	X	X			
Marketing problems				X		X
Limited fishing ground	X		X	X	X	
Difficulties on collecting membership fee			X			X
Lack of interest among fishermen	X		X			X
Limited financial source	X	X	X		X	
Fishery circular	X		X			
Conservation and control services	X	X	X	X	X	X
Government policies on fishery cooperatives	X	X	X	X	X	X

4.4.3. Success/failure of fishery cooperatives

Regarding success and failure of fishery cooperatives covered in the study, there is not any cooperative that reflects all the characteristics of successful fishery cooperative. The cooperatives, especially the Akyaka Fishery Cooperative and the Akcapinar Fishery Cooperative, located in the south Aegean coast seem to be more successful than others. In the central Aegean coast, the Foca Fishery Cooperative appears more successful than other two.

The Akcapinar Fishery Cooperative is particularly successful except economic results of cooperative members. In this cooperative, all fishermen were cooperative members and all cooperative members were active fishermen. This was also the oldest cooperative among the six, and has comparatively good results in terms of selected success and failure indicators (tables XVII - XVIII).

The Akyaka Fishery Cooperative is also successful cooperative like Akcapinar. Most of the success/failure indicators show similarity in these two cooperatives (table XVII - XVIII). However, capital availability (maximum up to \$130) is possible for the members in this cooperative and also percentage of members, those find their cooperative successful, is the highest (81 percent). Besides, socio-economic indicators (table X), economic and financial performance (table XIV) of the cooperative members indicate success and viability of small-scale fishery in Akyaka.

Both cooperatives as well as Foca are quite successful on combating with illegal fishing. Meeting attendance is quite good. Participation to general assembly is 80 and 100 percent in Akyaka and Akcapinar, respectively.

Akyaka, Akcapinar, and Marmaris Fishery Cooperatives receive and market fish and perform also other functions such as supply and service (provide bait, fuel, ice), defending members' rights, lobbying services, informing members about new regulations,

rules, collaborating with MARA and universities, which are not common among the fishery cooperatives in Turkey. Non-fishermen are not allowed to join these three cooperatives. Additionally, no evidence of corruption, larceny or dishonest activities was observed in any of the six cooperatives.

Beside all these success characteristics of fishery cooperatives in the study area, there are many difficulties, problems (as shown in table XVI), and failure characteristics as follows:

- There is lack of solidarity among members. Lack of solidarity, which is one of the most important factors involved in success/failure of fishery cooperatives, has declared by the leaders of all cooperatives except Akcapinar.
- Some of the fishery cooperatives have difficulties in collecting membership fee from their members and can hardly afford even costs of general assembly.
- Lack of financial source and government aids are common problems of all, especially those located in the central Aegean coast.
- General educational level is low among the members and even leaders of fishery cooperatives.
- Selling fish outside the cooperatives that inhibits cooperative development is rather common among the members of Marmaris (80 percent) and Akyaka Fishery Cooperatives (20 percent).
- There are non-fishermen among members in the some of cooperatives.
- None of the cooperatives seemed to represent interest of qualified business management, education service, and patronage refund to their members.
- In addition to all those above, legislative support provided by government is also not sufficient.

Tables XVII and XVIII show some of key indicators of success/failure of fishery cooperatives in the study areas.

Table XVII: Success/failure indicators (quantitative) of cooperatives.

Key indicators of success-failure (%)	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Participation to general assembly	60	59	52	92	100	90
Members having conflicts with the cooperatives	3	0	30	8	8	12
Years in fishing	10	3	9	10	29	28
Members find cooperative successful	78	64	10	81	62	71
Membership is attractive enough	51	75	55	37	100	9
Members who sell their fish through his cooperative	-	-	-	80	100	20

Table XVIII: Success/failure indicators (qualitative) of cooperatives.

Key indicators of success-failure	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Providing inputs to the members	No	No	No	Partly Yes	Partly Yes	Partly Yes
Availability of capital	No	No	No	Yes	No	No
Combating illegal fishing in cooperative area	Good	Weak	Weak	Good	Good	No
Qualified business management	No	No	No	No	No	No
Increases in capital	Yes	No	No	No	No	No
Providing patronage refund	No	No	No	No	No	No
Solidarity among members	No	No	No	No	Yes	No
Education service	No	No	No	No	No	No

The relationship between cooperative members and the cooperatives gives an apparent signal to understand presence of members' satisfaction. Compare to Foca (6 percent), greater proportion of the survey respondents in Mordogan (90 percent) think that Fishery Cooperative is a failure. Furthermore, 30 percent of the Mordogan Cooperative members mention that they have problem with the cooperative. Table XIX shows the effectiveness of the cooperatives from members' point of view.

Table XIX: The effectiveness of cooperatives from members' point of view.

Percentage of members (Yes-%)	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Members find cooperative successful	78	64	10	81	62	71
Members find cooperative failure	6	-	90	9	0	0
Members find cooperative fairly successful	16	36	-	0	38	29

Compared to those in Mordogan, fishermen from Akayaka and Foca seem to be more satisfied and pleased with the performances of cooperative. Most of the fishers, 78 percent in Foca and 81 percent in Akyaka, declared that their cooperatives work successfully. In addition, 97 percent of the Foca Cooperative members express that they have no problems with the cooperative. The Karaburun Fishery Cooperative is similar to the case of Foca in that fishermen have no problem with the cooperative and they (64 percent) find their cooperative successful. But in contrast to Foca, the Karaburun Fishery Cooperative provides very little benefits to the members and its group size is relatively small and activities are rather limited.

None of the cooperative members in the study area are really satisfied with fishery. Furthermore, 25 percent of them seriously consider giving up fishing as profession (table XX).

Table XX: Cooperatives members' opinion about fishery.

%	Foca Co-op	Karaburun Co-op	Mordogan Co-op	Akyaka Co-op	Akcapinar Co-op	Marmaris Co-op
Satisfaction with fishery	50	64	55	58	77	44
Consider giving up fishery	19	14	35	68	8	12
Want children become fishermen	12	14	3	10	23	12

5. Discussion

This study aimed to investigate profile of selected fishery cooperatives, socio-economics of small-scale fishermen, and economic performance of fishing activity in an integrated way as first of its kind in Turkish small scale fishery. This does not mean to be representative of all Turkish small-scale fisheries. However, as Brawn and Garland (1988) mentioned in their similar study for U.S. Fishery, this study also provides a unique description that can assist the cooperatives, lenders, universities, and government to better understand the profile of fishery cooperatives and their socio-economic conditions and the problems fishers experience.

Despite various difficulties and uncertainties, resulting mainly from absent and/or unreliable basic information, all the objectives of the study were fairly reached. Although main problems, solutions, and strategies concerning fishery cooperatives in Turkey were stated (Kocel 1971; Arisoy 1974a; Arisoy 1974b; Ozcelik 1998), and certain advices were published in as early as 1970s, it was experienced during the course of this study that even regular and reliable record keeping, which is a legal obligation, was not practiced correctly by many cooperatives. Requirements for successful fishery cooperatives have not been fulfilled neither by government nor by fishermen side.

Primary information on costs and earnings in small scale fisheries is not gathered on a regular basis, update information is not provided by relevant authorities in Turkey. Therefore, main data presented in this study, was collected during the personal interviews. Although the aim of the study was to reach all the active cooperative members (176 fishers) only 72 percent of them (127 fishers) could be interviewed due to several reasons. This percentage is assumed to represent the general characteristics of the small-scale fishery in the study area.

Although in terms of export (with a share of 0.26%) and Gross National Product (with a share of 0.23%), the fishing industry had a minor impact in the agriculture (with a share of 2.7%) and national economy of Turkey, it was important for the livelihood of about approximately 57,520 (OECD, 2004) fishermen and approximately 100,000 with other people employed full time in related activities. In 2002, exports of fish products were valued at approximately US\$ 96.7 million and imports were occurred US\$ 18.7 million. The National level indicators such as ratio fish employment (0.002), fish contribution to GNP (0.002), and weight of apparent consumption (6.7 kg /person) express the importance level of fishery sector in the national economy. Probably because of this reason, literature on fisheries economic studies is rather scarce in Turkish fisheries. However, Franquesa et al. (2005) stated that ratio fish employment as 0.5 percent, fish contribution to GNP as 0.4 percent, and weight of apparent consumption as 48.9 kg/person for Spain. In terms of the recorded numbers employed on a regional basis, Spain has the largest fishery sector, with a total of 132,631 people employed in fisheries (25.2 % of the EU total), followed by Italy with 106,984 (20.3%), France with 66,804 (12.7%) and Greece with 49,525 (9.4%) (EC, 2000).

As a result of 127 interviews, average age of fishers was found to be 46.7 years old, average experience in fisheries was 26.1 years. Most of them (90 percent) were married, and 71 percent of them accepted fishing as main occupation. Unfortunately, such results are not available for average Turkish fishery to make comparison. However, there are few national studies and several international studies on small scale fisheries to make comparisons with these results. Ünal (2001) reported that during 1999-2000 fishing season the average age of the small scale fisherman in Foca, Turkey, was 45.3, their average experience in fisheries were 25.7 years, and 77 percent of them found to be married. When these values are compared with the results obtained for Foca in the present study (table VIII), the difference might be resulted from three years time interval and/or inclusion of

part time fishers in the previous study or the most probably dynamic nature of fishery. In another work carried out by Librero et al (1985) in Philippines mean age and experience in occupation of the small scale fishers were reported as 40 and 20 years, respectively. These values indicate that Turkish small scale fishers are relatively older and more experienced than the small scale fishers of the Philippines. On the other hand, results show surprising similarity to a case study performed by Idrissi et al. (2003) in Nador Lagoon (Morocco), in which mean age of fishermen also found as 45 and mean experience of fishermen found as 26 years.

The low percentage of Turkish fishermen below 30 years old (5 percent of all) appears to suggest that youths are not attracted to small scale fishery. In the study area, 55 years or older fishermen found to be 23 percent and 60 years old (retirement age) or older fishermen are 14 percent. However, regional studies (EC, 2000) show that percentages of 25 years or younger fishermen in marine capture fisheries in Spain, France, and Italy are between 11 to 14 percent while 55 years or older fishermen are about 12 percent in marine capture fisheries of Spain, and 42 percent in Italy.

Turkish fishers are mostly male. Although gender was not one of the indicators evaluated in this study, few female family members were observed to work as crew. Formal female employment in fishing is almost nonexistent. Only one female fisher was interviewed as skipper owner. However, female percentage is 2.7 according to findings of (Panayotu et al., 1985) on socio-demographic profile of heads of small-scale fishing households in Thailand. It should be noted here that officially, it is reported that about 250,000 people depend on fishing for a living. It is also known that high proportion of woman employed in parts of the fishery sector in some regions of European Union (EC, 2000). Regional economic studies show that 6.6 percent of marine fishing employees are women (EC, 2000).

Regarding local level socio-economic indicators (table X), most of the results of socioeconomic indicators estimated for small-scale fishery in selected fishing districts are comparable only to each others due to the lack of similar local studies in Turkey. If it was possible it would be discussed with the results of other segments such as trawlers or purse seiners too but this may be possible in future studies.

In the study area, local level socio-economic indicators such as vessel physical productivity, capacity physical productivity, per vessel day physical productivity, invested capital, capacity productivity, vessel productivity, and per vessel day productivity are the highest in Mordogan while power physical productivity, man physical productivity, man productivity, and power productivity are highest in Akyaka. Usually, Foca and Marmaris follow these two cooperatives. Karaburun and Akcapinar have the worst results of all. However, in some indicators (such as power physical productivity, man physical productivity, man productivity, and power productivity), Akyaka has clearly better results because of less mean engine power or in other words, more efficient use of power, less fuel costs, and crew size. Franquesa (2001) also reported high productivity results among some Spanish segments such as small trawlers, longliners and dredgers.

In his comparative study of Turkish coastal fisheries Berkes (1986) reported that the small-scale inshore fishery harvests a minimum of 1 ton/boat/year and maximum of 5 tons/boat/year. According to the author the overall average yield is about 3 tons per two-man boat (20 kg/day x 150 days/year). Although per vessel day physical productivities were found rather low (table X) in this study compared to that (Berkes, 1986) reported 20 kg/day, small-scale fishermen in the study area also concentrate on high-value species but by using comparatively low level of capital than that (Berkes, 1986) mentioned. The difference may also be resulted from different average landing prices and different time. It

is very likely that increasing fishing effort by time caused decreasing on catch per unit efforts of fishing vessels.

The Landing Prices are relatively high in the study area (table X). This is an expected result for small-scale fishery in the Mediterranean region due to high value species, high demand of fish, tourism that encourages demand. Berkes (1986) and Franquesa (2001) also stressed remarkably high average fish price of small-scale fishery in the Mediterranean. Average price of landing in Catalan *Cofradias* (Fishermen Guilds) Market is 3.6 Euro per kg, in some cases the price is higher (Franquesa, 2004) which is similar to average fish price in the fishing districts covered in this study. According to Charbonnier (1977 as cited in Berkes 1986), fish price in the Mediterranean are five times higher than the average world price, and this figure rises upto seven times when the demersal species are concerned.

In terms of capitalization, the average investment of a small-scale operation (including vessel, engine and gear) was US\$ 2,705 (minimum in Karaburun US\$ 1,466 and maximum in Mordogan US\$ 4,715). Berkes (1986) stated the average investment of two-man small-scale fishing vessels as US\$ 4,000 for the five different fishing cooperatives in Turkey. The difference might be related to different exchange rate of Turkish Lira against to US\$ or different structure of fishery, location etc. For example, average investment used by Mordogan fishermen is almost equal that Berkes (1986) mentioned, on the other hand average investment used by Karaburun fishermen (all are part-time) is less than half that Berkes (1986) reported. Meanwhile, it does not mean that fishers had this amount of money at the past to invest fishery; this is present value of capital.

Results related to per vessel day productivity of small-scale fishing boats in Mordogan (\$36.8) and Akyaka (\$34) are quite similar to results that Berkes (1986) reported (\$40 boat day) for small-scale inshore fishery in Turkey. On the other hand, some results are almost half of it in Marmaris and Foca and less in Akcapinar and Karaburun. Idrissi et al. (2003) estimated €36.7 per vessel day productivity of small-scale fishing boats in Nador Lagoon (Morocco) but according to Franquesa et al (2001), this is extremely positive result compared to other small-scale fisheries in Mediterranean costs of Morocco. Ünal (2001) estimated \$22.2 per vessel day productivity for the full-time small-scale fishing vessels in Foca but it should be noted that respondents were both cooperative members and non-members in (Ünal, 2001). However, it is very interesting to reach the same result in Foca compared to (Ünal, 2001). Another interesting result was reached in Karaburun where part-time fishery dominate small-scale fishery. \$10.3 per vessel day productivity in Karaburun is almost equal the per vessel day productivity of part-time small-scale fishery reported by Ünal (2003) for Foca.

Labour costs are the most important cost component of the four cases followed by the running costs. These results show similarity to the results reported by Tietze et al., (2005) in small-scale fisheries in France, Germany and Norway, where labour costs accounted for the major part of operating costs. However, in Akyaka and Marmaris, the situation is reverse that running costs are the most important cost components following by labour costs due to mostly not to use crew.

In terms of fish marketing, use of cooperatives was 100 percent in the Akcapinar Fishery Cooperative, 80 percent in the Akayaka Fishery Cooperative while it was the least in Marmaris Fishery Cooperative with 20 percent. However, Brown and Garland (1988) reported that only 5 percent of U.S. fishers use a cooperative to market their fish. On the other hand, Foca, Karaburun and Mordogan Cooperatives did not have any marketing facility. Relatively low percentage of using cooperative for marketing fish in Marmaris and also nonexistence of marketing facilities in three cooperatives may be clarified by explanation of Pollnac (1988). The author reported that, most fisheries have a great deal of

day-to-day variability in the amount of fish caught. This results in a highly variable and unpredictable income among fishermen. Middlemen in most fishing communities have had a long relationship with fishermen and understand the problems they face with irregular incomes. The middlemen frequently loan money to the fishermen in times of need such as when catches are light or productive equipment has been damaged or lost at sea. Knowing the fishermen's incomes are unpredictable, they permit a great deal of flexibility in repayment of loans. If fishermen's organizations are to succeed, they must also provide the same type of flexible services.

Average age of small-scale fishing vessels is 14.3 in the study areas. In another study by Idrissi et al. (2003), average age of artisanal fishing vessels in Nador Lagoon (Morocco) was reported as 14.4. However, Colloca et al. (2003) showed that an average age of artisanal fishing vessels in Cilento (Italy) is 23.9 years and AER (2000) reported that small-scale fishing vessels in Italy were older than other segments with an average age of 26 years.

In terms of economic results of the study, in four case studies (Foca, Mordogan, Akyaka, and Marmaris) small scale fishery seemed to perform reasonably well, but these are averages of overall economic results of fishing districts. Regarding individual analysis of fishing vessels, it was observed that among the small scale fishing vessels of the six cooperatives only 53 percent of the vessels showed positive economic results, 47 percent out of 127 fishing vessels covered by the study showed negative economic results after deducting costs related to depreciation and imputed opportunity cost. For example, in Foca 44 percent of fishing vessels have positive NCF. However, Ünal (2001) found that 57 percent of small-scale fishing vessels show positive NCF in Foca. Compared to previous results in the same fishing district (Ünal, 2001), number of small-scale fishing vessels showing positive NCF decreased in Foca. This is not a surprising result for the Foca because Ünal (2001) reported that unless increasing fishing effort is controlled, fishery will not be profitable in the region.

When comparing the regional economic results, small-scale fishery in Foca, Mordogan, Akyaka, and Marmaris have positive economic results but Karaburun and Akcapinar have losses. The net cash flow, economic and financial performance of most of the vessels in Mordogan and Akyaka was very satisfactory (table XIII, XIV, figure 28, 29). When Mordogan and Akyaka are compared to other four cases, there are many similarity on physical and economic productivities (table X), fishing efforts (maximum days at the sea), high percentage of fishermen who accept fishery as his only income source, age of fishermen, age and length of the fishing vessels etc. Looking at the other four cases, more than 50 percent of small-scale fishing vessels show negative results in Foca, Karaburun, Akcapinar, and Marmaris. Only 15 percent and 16 percent of fishing vessels from Mordogan and Akyaka show negative results respectively.

In this context, it is interesting to observe that small-scale fishing vessels of two cooperatives (Akyaka and Akcapinar) which operate in the same fishing ground, with almost the same fishing gears, showed entirely different economic results as well as different socio-economic indicators. Regarding differences in their economic results and socio-economic indicators, it should be noted that Akcapinar Fishery Cooperative is supposed to show economic results as good as Akyaka. It has younger and more powerful fishing fleet. Besides, average fish price is higher than that of Akyaka in this cooperative. Furthermore, in terms of socio-demographic characteristics, there are almost no differences between them. Age of fishermen, experience of fishermen, household population, numbers of economically dependent family members are almost the same. Characteristics of cooperatives and members such as foundation year (Akcapinar is the oldest), major activities, active members, rate of active members, membership rate, meeting attendance, using cooperatives for marketing (all fishermen in Akcapinar, sell their fish through the

cooperative), solidarity among members, even number of employees reflect that the Akcapinar Cooperative is rather stable, strong enough and well run. Overall findings of the study also confirm that the variations in economic results in two fishing cooperatives are not normal. The differences might be explained by different structure of two cooperatives or fishing experience, fishing fleet, fishing ground, catch composition, gears and so on. However, these characteristics are all the same or very similar in two cooperatives or even some of them are better in Akcapinar. Additionally, percentage of fishermen considering giving up fishing as a profession is the minimum (8 percent) in Akcapinar. Because of all the reasons mentioned above, it can be claimed that the differences between two cooperatives resulted from misreporting of respondents from the Akcapinar Cooperatives.

Though, average results show small-scale fishery is economically and financially viable in four cases out of six, individual analysing indicates that more than half of the small-scale fishing vessels from Foca, Karaburun, Akcapinar, and Marmaris have negative economic results. Meanwhile, it should be noted here that all kinds of cost components such as depreciation, interest, and labour costs were included in this calculation. Though, regarding labour costs, imputed amount is calculated for the skipper owner and crews from his family. The percentage of small-scale fishing vessels that show positive economic results (53 percent) is relatively low in the study area. When considering Tietze et al. (2005), a ratio of more than 10 percent can be accepted as good, only 41 percent of small-scale fishing vessels show good results in the study area. Additionally, it should be noted that 25 percent of small-scale fishermen declared that they want to give up fishery as a profession.

With this respect, an important point should be clarified that how fishermen can continue fishing operations if the economic conditions were too bad. The reasons are that fishermen especially part time fishermen consider only running costs, they do not take into account total costs of fishery. As long as the running costs are less than share income they never think to give up fishing. Additionally, fishermen always hope to catch more fish. And of course, lack of non fishing income generating alternatives is the most important factor to continue fishing. Most of the small-scale fishing vessels, which show net losses, have entirely positive operational income. For instance, only 3 percent of vessels show operational losses in the study area.

It also needs to be stressed that the fishery survives, although a considerable amount of negative economic performance. The most apparent reason for this is that the skipper owners, despite their negative income as owner, secures a job for themselves as crews. It is a difficult equilibrium that if they quit the business as owner, they loose their jobs as worker. In other words their self employment salary is their profit. However, if there is any other activity they can have the option of leaving fishery.

Economic results of small-scale fishing vessels from Karaburun, where part time fishery dominates small scale fishery and only 14 percent of small scale fishermen accept fishery as their main occupation are not amazing but the results should be taken into account for the Akcapinar Fishery Cooperative in which the results are the worst among six selected cooperatives. In the Akcapinar Fishery Cooperative all of fishermen defined fishery as their main occupation. Additionally, 46 percent of fishermen in Akcapinar have no alternative income source except fishery. It means their livelihood strictly depends on fishery. These two fishing districts, Karaburun and Akcapinar, are also similar to each others in that fishing labour costs are the highest in Karaburun and the third highest in Akcapinar compare to others.

When considering the economic viability of the small-scale fishing vessels in the study area, percentages of negative GCF for each of the cooperative were 56 percent in Foca, 57 percent in Karaburun, 15 percent in Mordogan, 16 percent in Akyaka, 65 percent

in Akcapinar, and 44 percent in Marmaris. Other fishing vessels studied (56 percent) can be accepted economically viable. Comparatively higher catch amount (because of higher fishing effort), less crew size and labour costs (especially in the case of Akyaka), structure of fishery (in the case of Karaburun) or misreporting might have played role on their results. On the other hand, regarding share income, almost all of the vessels showed positive economic results except one vessel from Foca, two vessels from Akcapinar, and one vessel from Marmaris. These vessels were similar to each others in that, running costs are relatively as high as others while total catch value were lower than others.

Most (but not all) artisanal fisheries in The Gulf of Castellammare, North West Sicily was found financially viable (Whitmarsh et al., 2003). The case studies of fishing units in Latin America, Africa, Europe and Asia suggest that – in most cases and in spite of heavily and sometimes overexploited fisheries resources – marine capture fisheries are still an economically and financially viable undertaking generating sufficient revenue to cover the cost of depreciation as well as the opportunity cost of capital and thus generating sufficient funds for reinvestment as well as employment, income and foreign exchange earnings (Lery et al., 1999). However, Lery et al. (1999) also reported that small-scale fishery show negative net results in many countries such as Indonesia (small-scale gillnetters), Senegal (small-scale encircling gillnetting), and China (stow netters).

In France the most profitable types of fishing vessels are small-scale coastal fishing units and also in Spain inshore fisheries have better results (Lery et al., 1999). According to authors, these good performances depend on low running costs and depreciation allowances. AER (2000) reported that Italian small-scale fishing vessels also show rather good economic results. In Turkey, Ünal (2004) studied viability of trawlers in Foca and declared that 60 percent of trawlers show losses or less than 10 percent economic performance (NP/TE). In this study, small-scale fishing vessels were studied in six selected fishing district including Foca showed very similar (59 percent of fishing vessels show negative or less than 10 percent economic performance) average economic results. However, only in Foca 69 percent of small-scale fishing vessels show negative or less than 10 percent economic performance.

In France, 8-10 meters length handliners have 26 percent ROI and 10-12 meters length gillnetters have 8 percent ROI. In Norway, 10 meters length gillnet handline vessels show 31 percent ROI, while in India, 5.5 meters length, non-motorized small-scale fisheries show 163 percent ROI, motorized 8.3 meters, and 9-12 meters length dolnetter show 61 percent ROI (Tietze et al., 2005). In this study, as a result of analyzing 127 small-scale fishing vessels from six selected fishing cooperatives in Turkey, ROI was estimated as 43 percent, meanwhile, high ROI estimated in Akyaka (160 percent) shows similarity to ROI (163 percent) of non-motorized small-scale fisheries in India. However, it should be noted that ROI (43 percent) for the small-scale fishery in the study area is the average result and there are 59 vessels which show negative ROI among the 127.

Regarding fishery cooperatives, existence of rather limited studies on fishery cooperatives in Turkey (section 4.4.1.) makes the findings of the study more valuable. On the other hand, it makes also difficult to discuss them. Existing studies on fishery cooperatives do not include similar results to discuss or some of them include lack or sometimes wrong information. For example, Timur and Dogan, (2003) expressed that there are 71 fishery cooperatives and 6,724 members of these cooperatives in Turkey but this is quite far from the reality. Because, Hazar, (1990) reported 229 fishery cooperatives with 14,750 members in 1980, in Turkey, and Cikin and Kızıldag, (1997) reported 262 fishery cooperatives in 1992. Looking at present statistics, there are 413 fishery cooperatives with a total of 21,719 members and 8 fishery cooperatives associations with 78 member cooperatives, and one central union of fishery cooperatives associations in Turkey (MARA, 2005).

Brown and Garland (1988) reported that information on structure and financial performance will help fishers plan new cooperatives and be useful to managers and boards in planning changes for their own cooperatives. The same basic information is also useful for private management firms, lending institutions, universities, and government agencies in their work with fishers and fishery cooperatives. Due to lack of reliable data, financial performance of the cooperatives could not be evaluated in this study. However, existing results can be useful to fishermen and decision makers.

In the study areas, some cooperatives display particular strengths and some of them displays weaknesses. Foca and Mordogan Fishery Cooperatives in the central Aegean coasts do not have cooperative building, vehicle, and marketing facility. By contrast, the south Aegean cooperatives have employees, vehicle, cooperative building or meeting place and market fish in the cooperative. Marketing cooperatives are prominent on the south of Aegean coast. These cooperatives have a high percent of active members but on the contrary membership rate is low. The reason may be related to the willing to be free regarding selling fish, not to pay cooperative deduction or economic relation with the middleman who lend him.

Cooperative organizations and small-scale fisheries operated under fishery cooperatives are usually not managed successfully in many countries including Turkey, and as stated by Pollnac (1988) they have been characterized more by failure than success.

There are many reasons for failures of the fishery cooperatives that some of them also observed in this study but what Sato (1999) mentioned as the most obvious and persistent are very suitable not only cooperatives in study area but also almost all fishery cooperatives in Turkey. They appear to be:

- Wrong identification and planning and hence no apparent benefits to fishermen and lack of interest on the side of the membership,
- Unqualified and uninspired business management and leadership,

In addition to those reasons above, financial, organizational, educational and legislative problems can be counted as fundamental problems and reasons for failures of fishery cooperatives.

6. Conclusion

There are three dimensions of the study; fishermen, fishing activity, and fishery cooperatives. These are evaluated from the socio-economic point of view and general conclusions of the study are reached as follows:

Fishermen, who are responsible for livelihoods of average 2.4 family members, feel that their livelihoods and viability are generally threatened by irregular and relatively low level of income. Although 25 percent of them desire to quit the profession, they have to continue fishing due to lack of other employment opportunities. As they also provide self employment activity the small scale fisheries are viable. When other employment opportunities do not exist, more attention needs to be paid to fishery management. Because life of some local people entirely depend on fishery.

Fishery as a commercial activity seems to be viable for only 56 percent of boat owners in the study area. But regarding good economic performance, only 41 percent of small-scale fishing vessels show good results. Theoretical analysis of the study indicates that majority of small-scale fishing activity show negative or insufficient economic performance. This might have caused by recreational form of professionally registered fishing boats and misreporting. In both cases more attention needs to be paid on management.

Regarding fishery cooperatives covered in the study, even though most of the members surprisingly find their cooperative successful, some of the cooperatives are rather insufficient in providing services to their members. Some cooperatives show particular strengths and are partly successful on marketing fish but perform less than their potential, due to many internal (lack of solidarity, lack of qualified business management), and external success factors (weak legislative support by government, present tax system, lack of training). Nevertheless, contribution of cooperatives to the society such as providing fresh fish at a reasonable price, and their function in assisting management bodies are important and usually unseen factors. Therefore survival of cooperatives is very important for the society and management bodies as well as fishermen.

In this respect, considering results on fishing, fishermen, and fishery cooperatives, the state of small scale fishery reflects clear signals for management boards of fishery cooperatives as well as both for local and central management authorities.

To help to development successful fishery cooperatives and small-scale fishery in Turkey the following measures are suggested:

- Fishermen should be materially benefited from becoming members of fishery cooperatives like in Japan and Spain,
- Fishermen and management bodies of cooperatives should be educated regarding cooperation, sustainable fishery, and successful cooperatives through the MARA, Universities or NGOs,
- New legal regulations related to tax system, access to fishery or marketing fish through cooperatives should encourage membership or make membership compulsory,
- The cooperative Law no. 1163, which arranges the establishment and the working procedure of cooperatives, needs to be reformed in order to improve the efficiency of the existing cooperatives,
- Subsidies in the form of tax reduction (in marketing) should be taken into consideration for encouragement of cooperative membership as well as viability of the cooperatives,

- There is a need to describe professional and recreational fishermen and implement new regulations to preserve the livelihood of professional fishermen, whose life entirely depend on fishing.

7. References

- AER. 2000. Concerted Action: Co-ordination of Research in Fishery Economics and Promotion of Common Methods for Economic Assessment in EU Fisheries, 2000. Economic performance of selected European fishing fleets. Promotion of common methods for economic assessment of EU fisheries. Annual Report 2000. pp 213.
- AER. 2003. Concerted Action: Co-ordination of Research in Fishery Economics and Promotion of Common Methods for Economic Assessment in EU Fisheries, 2003. Economic performance of selected European fishing fleets. Promotion of common methods for economic assessment of EU fisheries. Annual Report 2003. pp 289.
- ANON. 2002. State Institute of Statistics, Fishery Statistics, pp 45p.
- ANON. 2004. State Institute of Statistics, Fishery Statistics, pp 62.
- ANON. 2005. Republic of Turkey, Prime Ministry State Institute of Statistics. Turkey: Economic and Financial Data. <<http://www.die.gov.tr>> (2005, August 11).
- ARISOY, S. 1974a. What should be the strategy of Turkish fishery cooperative's movement? (I), (in Turkish). *Balik ve Balıkçılık*. 22 (3), 19-22.
- ARISOY, S. 1974b. What should be the strategy of Turkish fishery cooperative's movement? (II), (in Turkish). *Balik ve Balıkçılık*. 22 (3), 23-25.
- BATICADOS, D.B., AGBAYANI, R.F., GENTORAL, F.E. 1998. Fishing cooperatives in Capiz, central Philippines: their importance in managing fishery resources. *Fisheries Research*. 34, 137-149.
- BERKES, F. 1986. Local-Level Management and the Commons Problem. A Comparative Study of Turkish Coastal Fisheries, *Marine Policy*. 10, 215-229.
- BERKES, F., R. MAHON, P. MCCONNEY, R.C. POLLNAC and POMEROY, R.S. 2001. *Managing Small-Scale Fisheries: Alternative Directions and Methods*. International Development Research Centre, Ottawa. pp 308.
- BILDIRICI, M. 2005. Akyaka'nin tarihi. Akyakayı Sevenler Derneği. <<http://www.akyaka.org/>> (2005, December 2).
- BILECENOGLU, M., TASKAVAK, E., MATER, S., and KAYA, M. 2001. Checklist of Marine Fishes of Turkey. *Zootaxa* 113, 1-194.
- BONETTI, M. 1976. Cooperation action in the fishing industry. In *Forms of Cooperation in the Fishery Industry*. Commission of the European Communities Information on Agriculture No.9.
- BROWN, F.P and GARLAND, W.R. 1988. *Fishery Cooperatives*. ACS Research Report Number 44. United States Department of Agriculture. pp 15.
- BROWN, L.R and KANE, HAL. 1997. Yarını Düşünmek/Dünyanın Nüfus Taşıma Kapasitesinin Yeniden Değerlendirilmesi. TUBITAK-TEMA Vakfı Yayınları 6.
- CASTILLO OBISBO, R. 1980. Madridejos Fishermen's Cooperative Marketing Association, Inc. Paper delivered at the Symposium on Development and Management of Small-scale Fisheries, Kyoto, Japan.
- CATTARINUSSI, B. 1973. *A sociological study of an Italian community: Towards a Social Understanding of Seafaring*. London.
- COGECA. 2005. General Confederation of Agricultural Co-operatives in the European Union <http://www.cogeca.be/en/cogeca_objectifs.asp> (2005, July 28).

- COLLOCA, F., CRESPI, V., CERASI, S. and COPPOLA, S.R. 2003. Evolution of the artisanal fishery in Cilento, Italy. *Informes y Estudios COPEMED*. No. 10. p 1-60.
- CIKIN, A and KIZILDAG, N. 1997. Agricultural cooperative movement in Turkey and European Union, (in Turkish). *Bulten. Kooperatifcilik Özel Sayisi. TMMOB Ziraat Muhendisleri Odasi Izmir Subesi*.
- CIKIN, A. and ELBEK, A.G. 1991. Fishery Co-operatives in Turkey and EU (in Turkish). *Egitiminin 10. yılında Su Urunleri Sempozyumu*. 12-14 Kasim, Izmir. pp 751.
- CREAN, K., SYMES, D. 1996. Fisheries management in crisis. Fishing News Book, Oxford.
- CUNNINGHAM, S. 1981. The increasing importance of economics in fisheries regulation. Centre for the Economics and Management of Aquatic Resources-CEMARE, Research paper 13. p 14.
- DAVIDSE, W.P., CORMACK, E., OAKESHOTT, E., FROST, H., JENSEN, C., REY, H.S., FOUCAULT, F., TAAL, C. 1993. Costs and earnings of fishing fleets in four EC countries. Agricultural Economics Research Institute (LEI-DLO) Department Fishery, The Hague, pp 202.
- EPPLE, G. 1979. The anatomy of successful small-scale fishermen's cooperative. Grenada, W.I. unpublished manuscript.
- EUROPEAN COMMISSION. 2000. Regional Socio-economic studies on employment and the level of dependency on fishing. European Commission, Directorate-General for Fisheries. Lot No.23: Coordination and Consolidation Study, Final Report. pp 113.
- FOOD AND AGRICULTURE ORGANISATION. 1971. Manual on Fishermen's Cooperatives. Rome.
- FOOD AND AGRICULTURE ORGANISATION. 1995. The state of world fisheries and aquaculture. FAO Fisheries Department, Rome.
- FOOD AND AGRICULTURE ORGANISATION. 1999. Indicators for sustainable development of marine capture fisheries. FAO, Rome. Fisheries Technical Guidelines for Responsible Fisheries. No: 8.
- FOOD AND AGRICULTURE ORGANISATION. 2001. World fisheries, Aquaculture Atlas CD-ROM. FAO, Rome.
- FOOD AND AGRICULTURE ORGANISATION. 2002. The state of world fisheries and aquaculture, FAO Fisheries Department, Rome.
- FRANQUESA, R. 2001. Methodology and use of socio-economical indicators for managing fisheries. 87th Session of OECD Fisheries Committee, Spanish contribution to Study on Economic and Social fisheries sustainability indicators, OECD Fisheries Committee.
- FRANQUESA, R., MALOULI, I.M., ALARCÓN, J.A. 2001. Feasibility assessment for a database on socio-economic indicators for Mediterranean fisheries. Studies and Reviews. General Fisheries Commission for the Mediterranean. No. 71. Rome, FAO. pp 55.
- FRANQUESA, R. 2004. Fishermen guilds in Spain (Cofradías): economic role and structural changes. IIFET 2004 Japan Proceedings.
- FRANQUESA, R. 2005. La estimación de indicadores económicos en las pesquerías mediterráneas. Ramón Franquesa, (Ed.), Amor El Abed, Ahmed Aboukhader, Scander Ben Salem, Djamila Ferhane, Jordi Guillén, José Antonio Alarcón,

- Malouli Idrissi Mohammed, Mouloud Hachemane, Mohammed Zergani. 2005. FAO. GFCM Technical Papers.
- FREIRE, J. and ALLUT, G.A. 2000. Socioeconomic and biological causes of management failures in European artisanal fisheries: the case of Galicia (NW Spain). *Marine Policy*. 24, 375-384.
- GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN. 1992. Report of the First Session of the Working Party on Fisheries Economics and Statistics. Fisheries Report, Rome, FAO. No. 468, pp 151.
- GIBSON, J. 1978. The successes and failures of the fishing cooperatives of Belize. In J.B. Higman, F. Williams, and P. Roedel, eds. *Proceedings of the 30th Annual Gulf and Caribbean Fisheries Institute and the Conference on Development of Small-scale Fisheries in the Caribbean*. Miami: University of Miami.
- GÜCLÜSOY, H and SAVAS, Y., 2003. Status of Mediterranean monk seal (*Monachus monachus*) in the Foca Pilot Monk Seal Conservation Area, Turkey. *Zoology in the Middle East*, 28, 5-16.
- HAZAR, N. 1990. Kooperatifcilik tarihi, Türk Kooperatifcilik Eğitim Vakfı yay., Ankara.
- INTERNATIONAL CO-OPERATIVE ALLIANCE. 1995. ICA Report: Cooperatives, Sustainable Fisheries and Food Security. International Conference on Sustainable Contribution of Fisheries to Food Security, Kyoto, Japan.
- INTERNATIONAL CO-OPERATIVE ALLIANCE. 2005. International Co-operative Information Centre <<http://www.wisc.edu/uwcc/icic/>> (2005, June 7).
- IDRISSI, M., ZAHRI, M.Y., HOUSSA, R., ABDELAOUI, B., EL OUAMARI, N. 2003. Peche artisanale dans la Lagune de Nador: exploitation et aspects socio-economiques. *Informes y Estudios COPEMED*. No. 10. p 61-122.
- JAYARAMAN, R., SELVERAJ, P., SENTHILATHIBAN, R., SURESH, R. 1988. Fisheries Economics Research in India, a Review. Central Marine Fisheries Research Institute, Spec. Publication. No.40, pp 22.
- KING, M. 1995. Fisheries biology: assessment and management. *Fishing News Book*, pp 341.
- KNUDSEN, S. 1998. What role can fishermen's co-operatives play in the Turkish fishery? (in Turkish). *E.U. Journal of Fisheries and Aquatic Sciences*, 15 (3-4), 315-329.
- KNUDSEN, S. 2001. Entangled knowledges of the Black Sea. Confrontation and Convergence between Turkish fishermen and marine scientists. Ph. D. thesis. Department of Social Anthropology, University of Bergen, Norway. pp 406.
- KOCABAS, O.Y. 2002. Evolution of cooperative idea and agricultural cooperatives in Turkey, (in Turkish). Dokuz Eylül Üniversitesi, Atatürk İlkeleri ve İnkılap Tarihi Enstitüsü, Doktora tezi, İzmir. pp 292.
- KOCABAS, O.Y. 2003. The developments in the idea of cooperatives in Turkey, (in Turkish). *Turkish Journal of Agricultural Economics*. 8, 15-24.
- KOCEL, T. 1971. Fisheries and cooperations, (in Turkish). *Balık ve Balıkçılık*. 19 (3), 23-27.
- LERY, M.J., PRADO, J and TIETZE, U. 1999. Economic viability of marine capture fisheries. Findings of a global study and an interregional workshop. FAO Fisheries Technical Paper. No. 377. Rome. pp 130.

- LIBRERO, R.A., CATALLA, R.F., FABRO, R.M. 1985. Socioeconomic conditions of small-scale fishermen and fish farmers in the Philippines. In: T. Panayotou (Eds.). Small-scale fisheries in Asia: socioeconomic analysis and policy. International Development Research Center, Ottawa, p 36-45.
- LLEONART, J., SALAT, J and FRANQUESA, R. 1999. The problems of fisheries management in the Mediterranean. Catalonia as a case study. The 1st International Congress on Maritime Technological Innovations and Research, Barcelona.
- THE MINISTRY OF AGRICULTURE, FORESTRY and FISHERIES OF JAPAN. 2003. MAFF, Fisheries Working Dynamic Statistics Annual Report.
- MINISTRY OF AGRICULTURE AND RURAL AFFAIRS. 1997. Existing structure, problems and solutions of Ministry of Agriculture from the agricultural cooperatives point of view (in Turkish). Bulten. Kooperatifcilik Özel Sayısı. TMMOB Ziraat Muhendisleri Odası İzmir Subesi.
- MINISTRY OF AGRICULTURE AND RURAL AFFAIRS. 2000. Development strategies of Turkish fisheries sector, (in Turkish). Koruma Kontrol Genel Müdürlüğü, Ankara, pp 54.
- MINISTRY OF AGRICULTURE AND RURAL AFFAIRS. 2004. The commercial fish catching regulations in seas and inland waters in 2004-2006 fishing period (in Turkish). Republic of Turkey, Minister of Agriculture and Rural Affairs, General Directorate of Conservation and Inspection, Circular No. 36/1 Ankara.
- MINISTRY OF AGRICULTURE AND RURAL AFFAIRS. 2005. Teskilatlanma ve Destekleme Genel Mudurlugu. <<http://www.tedgem.gov.tr/>> (19/08/2005).
- MEANY, T.F. 1987. Resource rent, common property and fisheries management: an economic perspective. IPCF Symp. on the exploitation and management of marine fishery resources in southeast Asia, Darwin, Australia. pp 10.
- MISHRA, B.K. 1997. Fisheries Co-operatives in India. Co-op Dialogue, 7 (2) 28 p.
- MULAYIM, Z.G. 2000. Turkish cooperative movement towards 21. century: why classical problems were not able to remove? How could be removed?, (in Turkish). ESKOMB, Turkiye Esnaf ve Sanatkarlar Kredi ve Kefalet Kooperatifleri Birlikleri Merkez Birliği yayin organi. Ocak/Subat 2000. 224, 21-28.
- NARKSWASDI, U. 1976. An Evaluation of the Kuala Linggi Fishermen's Cooperative Credit and Marketing Society. Ministry of Agriculture and Cooperatives, Kuala Lumpur.
- NEILAND, A. 1992. Economic approach to fisheries management. CEMARE Misc. pap. no. 28, p 1-5.
- OECD. 1997. Towards Sustainable Fisheries-Economic Aspects of the Management of Living Marine Resources. OECD, Paris, France, pp 176.
- OECD. 2004. Review of Fisheries in OECD Countries. Country Statistics 2000-2002. Paris, France, pp 217.
- OECD. 2005. Organisation for Economic Co-operation and Development. <<http://www.oecd.org/>> (2005, February 11).
- OZCELIK, A. 1998. Su ürünleri üretimi, kredileri ve kooperatifcilik. Karınca. 64: (743), p 6-11.
- OZESMI, U. 1999. Conservation Strategies for Sustainable Resource use in the Kizilirmak Delta, Turkey. University of Minesota, Ph.D. Dissertation.

- PANAYOTOU, T. 1982. Management Concepts for Small Scale Fisheries: Economic and Social Aspects. FAO Fisheries Technical Paper, No. 228 FAO, Rome, 53 p.
- PANAYOTOU, T., ADULAVIDHAYA, K., ARTACHINDA, S., ISVILANONDA, S. and JITSANGUAN, T. 1985. Socioeconomic conditions of coastal fishermen in Thailand: A cross-sectional profile In: T. Panayotou (Eds.). Small-scale fisheries in Asia: socioeconomic analysis and policy. International Development Research Center, Ottawa, p 55-72.
- POGGIE, J.J. and GERSUNY, C. 1974. Fishermen og Galilee. University of Rhode Island Marine Bulletin Series. No. 17.
- POLLNAC, R.B. 1988. Evaluating the potential of Fishermen's Organizations in developing countries. International Center for Marine Research and Development, University of Rhode Island, Kingston, RI, pp 79.
- POMEROY, R.S. 1992. Economic studies of small-scale fisheries: a comparision of methodologies. Asian Fisheries Science. Manila, Philippines. 5, 63-72.
- POMEROY, R.S. and WILLIAMS, M.J. 1994. Fisheries Co-management and Small-scale Fisheries: A Policy Brief. Fisheries. Co-management project, International Center for Living Aquatic Resources Management, Manila. pp 15.
- PROCHASKA, F and CATO, J. 1983. The economic consideration for fisheries management. Nielsen, L.A. and Johnson, D.L. (Ed.), 1983. Fisheries techniques, AFS, Bedhasta, Maryland.
- SANTEN, VAN G. 2003. Successful small-scale fisheries, some global lessons of experience, past and present. Change Island Workshop, Vulnerability in Coastal Communities: Adaptations to Change and Planning for the Future, Newfoundland.
- SATO, M., 1999. How Should We Develop Fishery Cooperatives in Developing Countries? Some Points for Cosiderations in due reference to Japanese Experinces. National Lecture Text. Federation of Fisheries Cooperative Associations, Tokyo.
- TIETZE, U., PRADO, J., LE RY, J-M., LASCH, R. 2001. Techno-economic performance of marine capture fisheries. FAO Fisheries Technical Paper. No. 421. Rome, pp 79.
- TIETZE, U., LASH, R., THOMSEN, B., RIHAN, D. 2005. Economic performance and fishing efficiency of marine capture fisheries. FAO Fisheries Technical Paper. No. 482. Rome.
- TIMUR, M and DOGAN, K. 2003. The role of Istanbul fish co-operatives in Turkish fisheries. Biljeske-Notes. No.87, Institute of Oceanography and Fisheries, Split, Croatia.
- ÜNAL, V. and HOSSUCU, H. 1996. Economic analysis of Foca trawls (in Turkish). E.U. Journal of Fisheries and Aquatic Sciences. 13(1-2), 149-161.
- ÜNAL, V. 2001. An investigation on socio-economic analysis of Foca fishery and its evaluation from the sustainability point of view (in Turkish). Ph.D. Thesis, Ege University, FBE, Bornova, pp 239.
- ÜNAL, V. 2003. Socio-economic analysis of part time small-scale fishery, Foca (Aegean Sea). E.U. Journal of Fisheries and Aquatic Sciences 20, 165-172.
- ÜNAL, V. 2004a. Regarding fishery cooperatives. Balıkcılık Mesleki Egitim Programi Ders Notlari (in Turkish).12 Mayıs 2004, Mordogan Belediyesi Mesleki Egitim Merkezi, Izmir.

- ÜNAL, V. 2004b. Viability of trawl fishing fleet in Foca (the Aegean Sea), Turkey and some advices to central management authority. *Turkish Journal of Fisheries and Aquatic Sciences*. 4, 91-95.
- WHITMARSH, D., JAMES, C., PICKERING, H., NEILAND, A. 2000. The Profitability of Marine Commercial Fisheries: a review of economic information needs with particular reference to the UK. *Marine Policy*. 24, 257-263.
- WITHMARSH, D., PIPITONE, C., BADALAMENTI, F., D'ANNA, G. 2003. The economic sustainability of artisanal fisheries: the case of trawl ban in the Gulf of Castellammare, NW Sicily. *Marine Policy* 27, 489-497.

Appendix

Questionnaires for Small-Scale Fishery

Characteristics	
1. Name of the vessel	
2. Name of the fishery cooperative in the fishing district	
3. Member of the fishery cooperative	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Age of the vessel (years)	
4. Length of the vessel (meters)	

Engine

5. Age (years)
6. Power (HP)

Crew

7. Number of crew- including captain (crew from owner family will be written separately)
8. Share system (percentage of the share for crew, vessel and owner) or Labour costs (detailed information)

Costs

9. Required fuel amount (lt) (per active fishing day)
10. Oil cost (per active fishing day)
11. Ice cost (per active fishing day)
12. Food cost (per active fishing day)
13. Bait cost (per active fishing day)
14. Insurance payment (annual)
15. Repair and maintenance costs of the vessel (annual)
16. Repair and maintenance costs of the engine (annual)
17. Repair and maintenance costs of fishing gear (annual)
18. Other costs such as cooperative's member fees (annual)

Capital-Depreciation-Interest

Vessel

19. Age and value
20. Value of new one

Engine

21. Age and value
22. Value of new one

Fishing gear

23. Amount
24. Economic life period
25. Value of new one
26. Age and value

Main problems		
53. Problems regarding fishing ground?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
54. Problems regarding bank credits?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
55. Problems regarding fishing port?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
56. Conflicts with other fishers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
57. Problems regarding cooperative?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
58. Conflicts with tourism?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
59. Problems regarding local administration?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
60. Problems regarding coastguard?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
61. Problems on using bank credit?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
62. Problems with local administration?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
63. Problems on finding crew?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
64. Others		

Members-Cooperative Relationship		
65. When did you become a cooperative member?		
66. Have you ever had duty in management board of cooperative?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
67. If yes;	<input type="checkbox"/> Management board	<input type="checkbox"/> Auditing
68. Why did you become a cooperative member?		
1. <input type="checkbox"/> to market fish on better price		
2. <input type="checkbox"/> to provide cheaper inputs		
3. <input type="checkbox"/> to cope with bureaucratic problems		
4. <input type="checkbox"/> social reasons		
5. <input type="checkbox"/> others		
69. Have you met your expectations? If yes which one or ones?		
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
70. Have you ever got patronage refund?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
71. When was the last time you got patronage refund?		
72. How much did you get?		
73. Do you join general assembly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Sometimes

74. Did you participate last year?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
75. If you didn't, why?		
1 <input type="checkbox"/> I don't believe cooperative' utility		
2 <input type="checkbox"/> I had more important work to do		
3 <input type="checkbox"/> I had problems with management boards of cooperative		
4 <input type="checkbox"/> I was not aware		
5 <input type="checkbox"/> Other		
76. What are the activities of the cooperative?		
1 <input type="checkbox"/> Marketing		
2 <input type="checkbox"/> Supply inputs		
3 <input type="checkbox"/> Education		
4 <input type="checkbox"/> Other		
77. Do you believe that the cooperative is successful?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
78. Is there a price advantage of marketing fish through the cooperative	<input type="checkbox"/> Yes	<input type="checkbox"/> No
79. What type of project should be applied to become more successful?		
1 <input type="checkbox"/> Establishing cold storage		
2 <input type="checkbox"/> Supplying some inputs		
3 <input type="checkbox"/> Supplying fuel-oil		
4 <input type="checkbox"/> Marketing also aquaculture products		
5 <input type="checkbox"/> Other		
80. Do you think cooperative has always the same management board?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
81. Does the cooperative perform any activity to protect fish stocks?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
82. What type of activities they are?		
1.		
2.		
3.		
83. Do you think cooperative is successful?		

Questionnaire for Fishery Cooperative

1. Name of the cooperative
2. Foundation year
3. Number of registered member
4. Number of active member
5. Number of non-members fishermen using the same fishing area
6. Number of unlicensed fishing vessels
7. Total number of fishermen in the cooperative area
8. Cooperative fishing area (km²) or coast line (km)
9. How many members joined the last general assembly?
10. What are the main activities of cooperative?
11. Rate of cooperative deduction from fishermen?
12. Annual membership fee?
13. Total annual fish amount and value marketed through cooperative (ton)

	1998	1999	2000	2001	2002
Members					
Non-members					

14. If cooperative supply service to its members, their amounts and types?

	1998	1999	2000	2001	2002
Bait					
Ice					
Others					

15. Is there any project for future? What type of?
16. Does cooperative combat with illegal fishery?
17. Is there a qualified business management in cooperative?
18. Does cooperative pay patronage refund to members?
19. Is there solidarity among members?
20. Is there education service of cooperative?
21. Does cooperative inform members on new regulations?
22. Cooperative provides credit to members?
23. Has cooperative ever increased in capital? If yes, when?
24. Main problems of the cooperatives?