

Information source preferences of small-scale fishers in the Aegean Sea coast of Turkey

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Abstract

Information source preferences of small-scale fishers can play a role in decision-making processes and affect the sustainability of small-scale fisheries. In this respect, determining useful communication tools to eliminate the information gaps and lack of information of fishers is important for sustainable and effective fisheries management. The purpose of this study was the determination of the preferred source of information and priorities of the small-scale fishers who operate along the Aegean Sea coast of Turkey. Data were collected from a random sample of 278 small-scale Turkish fishers located along the Aegean coastline via face-to-face interviews. Information source preferences of fishers were determined by Repertory Grid Technique. In the analysis, obtaining information about fisheries focused on three criteria such as marine ecology, fisheries technology, and fisheries policies. The level of importance given by fishers for each criterion was determined. Fishers prefer to get information from other fishers, followed by fishery cooperatives, and their own experiences ($\chi^2(11, n = 278) = 1305.920, P < 0.001$). Fishery cooperatives are the closest organizations to fishers. The use of cooperatives as a source of information can be interpreted as an element that can facilitate access to information when evaluated through the “availability” of behavioral economics. Fishery cooperatives, which stand out in fishers’ information source preferences, have the potential to be a valuable source of information in all aspects. The results of the research are thought to benefit researchers from non-governmental organizations, research institutes, and universities that carry out national and international projects with fishers.

Keywords

Availability, fishery cooperatives, information behavior, repertory grid technique, behavioral economics

Introduction

The correct and proper use of information sources is important for sustainable fisheries management to train, raise the awareness of fishers, or meet their information needs. Any individual needs an information (Hisyam Selamat and Choudrie 2004; Wilson 2006). The term “information” is an abstract concept used to denote any amount of data, code or text stored, sent, received, or manipulated in any medium (Capurro and Hjørland 2003).

Information is a tool used to reduce uncertainties in in-active action selection and is the necessary input in decision-making processes (Solano et al. 2003). There is a direct relation between the quality of the information used by a decision-maker and decision-making performance, and between the availability of information and the sharpness of the decision (O’Reilly 1982). The individuals’ perception of “useful” knowledge leads him/her directly to the “useful” decision-making process (Streufert 1973). Therefore, the right decision does not guarantee a good outcome; such

pragmatism has paid off (Buchanan and O'Connell 2006). The limited knowledge of the individual reveals the need for information in the decision-making process (Simon 1955).

The information gap appears in the case of semantic inconsistency or systematic deficiency in the individuals' social environment. Information, assistance, or a link is needed to eliminate this gap (Case 2002). Lack of knowledge, skills, or abilities required for adequate access, interpretation, and application of information reveals the lack of information (Britz 2004). The information gap is one of the factors affecting political participation (Cho and McLeod 2007). The success of the Ecosystem Approach to Fisheries (Anonymous 2003, 2005, 2012; Dimech et al. 2014; Ünal et al. 2018) which considers co-management approach and stakeholder participation into management process (Berkes 2009; Claudet and Guidetti 2010) for the sustainable management of natural resources, particularly the management of marine living resources is getting more important and remarkable. In this respect, the information gap may negatively affect stakeholder engagement, thus may prevent the achievement of sustainable fisheries management targets.

In the literature, information source preferences are evaluated within the framework of information behavior (Wilson 2000; Case 2002; Dawes and Sampson 2003). Information behavior is the interaction (information seeking and access to information) of several potential sources that can respond to individuals' interests and information needs (Wilson 2000). Some researchers (Julien and Michels 2004; Remenova and Jankelova 2019) have pointed out that information behavior and decision-making processes are intertwined. It is stated that information behavior is also associated with externality (Swinton and Lowenberg-DeBoer 1998; Osei et al. 2017).

On the other hand, there are few studies on the choices and preferences of information sources (Fourie 2009). There are also very few studies, especially on the information behavior of fishers (Ikoja-Odongo and Ocholla 2003; Dutta 2009; Okwu et al. 2011). There may be a relation between fishers' information source preferences and sustainable small-scale fisheries. This situation arises from the potential information gap and lack of information on fishers and thus, from the information behavior of fishers. Reviewing the literature, we haven't found any direct research which considers information source preferences of small-scale fishers neither in Turkey nor in the Mediterranean.

The purpose of this research was the determination of the preferred source of information and priorities of the small-scale fishers operating at the Aegean Sea, Turkey. Because it is important to identify the sources of information for fishers located in the coastal-rural areas, to use accurate and sufficient communication resources, knowledge generated by the research can provide insight into policymakers, non-governmental organizations, and researchers to improve acceptable, less costly, and applicable policy interventions for supporting sustainable fisheries.

Materials and methods

Study area and data collection

The primary material of the research is the data obtained from small-scale fishers operating at the Aegean Sea, Turkey. It has been determined that the number of registered small-scale fishing vessels (<12 m) in the Aegean Sea is 4355 (Anonymous 2014). Proportional sample volume formula was utilized in determining the number of small-scale fishers to be interviewed (Newbold 1995). To reach the maximum sample volume, p : 0.50 and $(1-p)$: 0.50 are accepted. The number of fishers interviewed was calcu-

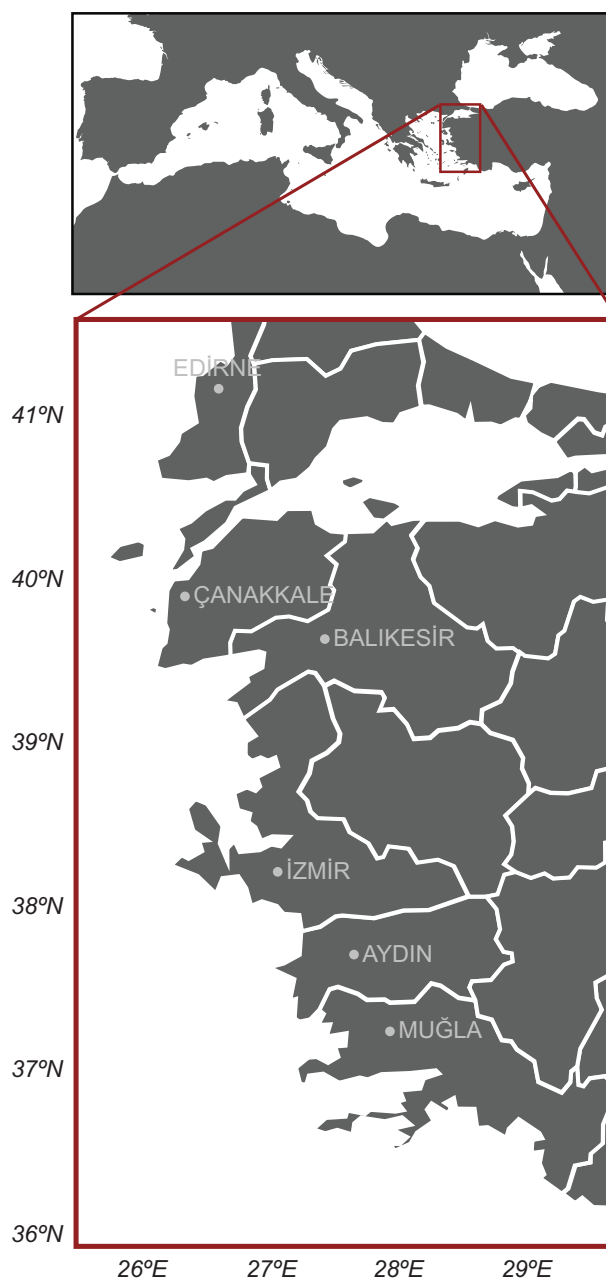


Figure 1. Study area. Ocean Data View.

lated as 278, taking into account the 99% confidence interval and a 7.5% margin of error.

The sample volume was distributed proportionally according to the provinces Edirne ($n = 9$), Çanakkale ($n = 9$), Balıkesir ($n = 8$), İzmir ($n = 143$), Aydın ($n = 13$), and Muğla ($n = 96$), respectively (Fig. 1). All interviews were carried out at the 62 fishing ports along the Aegean sea coast of Turkey in 2016, face-to-face, by an experienced interviewer. In order not to be affected by other fishers, face-to-face interviews were conducted in an isolated environment.

Information source framework

As a result of uncertainty, experienced individuals need to use personal and non-personal or internal and external sources of information (Kuhlthau 1993). Accordingly, the findings of Kuhlthau (1993) have been used to frame information source alternatives in the presently reported study. Criteria and information source alternatives are given in Table 1. Information sources (alternatives) are; Coast Guard, scientists (universities, institutes), non-governmental organizations (NGOs), television, and radio broadcasting, Other fishers (other small-scale fishers at the same port and/or colleagues), ministry, print media (newspaper, magazine), fishery cooperative, family members, fishing gear vendors, social media (Facebook, Twitter, Instagram, etc.) and fisher's own experience. The three criteria considered by fisheries experts as important components of the fisheries are; marine ecosystem, fisheries technology, and fisheries policy.

Table 1. Information sources (alternatives) and criteria for information preference.

Criteria	Information source (Alternatives)			
Marine Ecosystem	Fishery cooperative	Print media	Ministry	Coast guard
Fisheries Technology	Fishing gear vendors	Television and radio	Social media	NGOs
Fisheries Policy	Family members	Fisher's own experience	Other fishers	Scientists

The following questions were asked the fishers in the presently reported study: 1) To what extent would you prefer the information sources (alternatives) for the marine ecosystem? 2) To what extent would you prefer the information sources (alternatives) for the fisheries technology? 3) To what extent would you prefer the information sources (alternatives) for the fisheries policy? 4) Please rate the importance level for each criterion.

Fishers evaluated the importance levels (1: not important, 5: very important) that they gave to each three criterion and preference levels (1: strongly disagree, 5: strongly agree) for twelve alternatives on the five-point Likert (1932) type scale.

Data analysis

Information sources preferences of small-scale fishers were determined by the Repertory Grid Technique (RGT). In the technique, obtaining information about fisheries is discussed from three criteria. The level of importance given by fishers to 12 information sources for each criterion was determined. RGT is a useful cognitive mapping approach to assess how individuals and groups derive meaning from the people and objects around them (Walsh 1995). RGT, which is based on Kelly (1955) personal construct theory, is a method used to reveal personal fiction about his/her thoughts on a subject presented to people. Personal fiction theory is based on expectations for future events that were based on past experiences or based on similar events (Kelly 1955).

According to this theory, there is no absolute truth or objective reality (Ilbery and Hornby 1983). Each fiction has bi-polar construction (Curtis et al. 2008). The matrix used in RGT helps individuals to express themselves more quickly and better (Fransella et al. 2004). In short, RGT reveals what people think in their world (Tan and Hunter 2002). Although RGT is generally used by psychologists (Saúl et al. 2012), it is a frequently used method in agricultural economics, sociology, and marketing studies (Ilbery and Hornby 1983; Neimeyer 1993; Coakes et al. 1999; Bourne and Özbilgin 2008).

In the RGT, scores are assigned to each alternative/criterion combination. The scores obtained in the next stage were weighted according to the relative importance of the criterion. Finally, the aggregated scores were summed, and the total score for each alternative was obtained. The magnitude of the scores obtained gave the priorities of the alternatives.

In the meantime, the Friedman (1937) test was used to compare the priorities of information sources and information sources preferences in the current study.

Results

Table 2 presents the criteria for evaluating information source preferences of fishers. It is seen that the Friedman test was statistically significant. This result indicates that the importance of some information criteria is higher than others. Accordingly, it is determined that the most important information criterion for fishers is fishing technology, followed by marine ecosystem, and fisheries policies ($\chi^2(2, n = 278) = 67.329, P < 0.001$).

Table 2. Information source evaluation for criteria.

Criteria	Mean*	Std Dev
Fisheries Technology	4.14	1.16
Marine Ecosystem	3.37	1.38
Fisheries Policy	3.31	1.39

* indicates significance level is 0.05; 1: Not all-important, 5: Very important

When the priorities of information sources are evaluated according to the above criteria, the Friedman test was statistically significant ($\chi^2(11, n = 278) = 1305.920, P < 0.001$). This result indicates that some information sources are more prominent than others in terms of fisher preferences. In the light of such information, it is possible to say that fishers prefer to get information from other fishers. Other primary sources of information for fishers were fishery cooperative and their own experience (Table 3). As a source of information about fisheries, non-governmental organizations, family members, and fishing gear vendors were in the last place.

Table 3. Information source preferences.

Information source	Mean*	Std. Dev.	Ranking
Other fishers	45.71	13.60	1
Fishery cooperative	44.19	15.91	2
Fisher's own experiences	41.43	12.53	3
Television and radio	40.45	16.02	4
Scientists	38.62	16.07	5
Ministry	36.54	15.79	6
Print media	34.67	16.44	7
Social media	26.97	18.55	8
Coast Guard	26.22	13.64	9
NGOs	24.59	14.57	10
Family members	22.82	15.20	11
Fishing gear vendors	19.86	11.05	12

* indicates significance level is 0.05 according to the Friedman test.

Discussion

According to our findings, other fishers were found as the primary information source in the study area. This result supports the findings of Smith and Hanna (1993). Because, according to these researchers, face-to-face information transfer in fisheries is one of the most important reasons for the continuation of the fishing community.

Fishing technology has been determined by fishers as the most important information criterion. This may be due to the fishers' unlimited interest in increasing the Catch Per Unit Effort (CPUE) and the eagerness to receive such information. Another important finding obtained from the survey is that fishers considered the importance of knowledge criterion about marine ecosystem moderately important. However, during the fieldwork, it was observed that fishers have knowledge gaps, especially in subjects such as gonadal sex differentiation, seagrass beds, taxonomic identification. Therefore, future studies that focus on local ecological knowledge (Farr et al. 2018) in the study area should consider fishers' knowledge gaps on the marine ecology. On the other hand, the criterion of information about fisheries policies was found to be low, with no difference with the marine ecosystem criterion, in the study. Information on fisheries policies includes practices that can indirectly raise fishers' CPUE. At the same time, neglecting information about fisheries policies may prevent the development and implementation of the co-management approach. In fact, one outcome of the current fisheries management shows that fishers care about fish-

ing policies only moderately. However, in order to play a role in fisheries management, fishers are also expected to show more interest in relevant policies. Here the question arises: do current management practices hinder fishers' eagerness to learn relevant policies? Considering the results of the study, we can claim that the present fisheries management system does not support fishers in this regard in the study area.

The fishery cooperative is among the primary information choices. Cooperatives are organizations established and managed by themselves. Therefore, it can be said that fishers see cooperatives as entities that are close to them. The concept of availability in behavioral economics (Thaler and Sunstein 2008) can be seen as a phenomenon that can facilitate access to information. Using fishery cooperatives as an information source can be interpreted as a factor that can facilitate access to information. Hence, it is an expected result that cooperatives, which are a cumulative source of information, come to the fore in fishers' preferences. Differently, it is necessary to clarify that the academy and ministry were in the middle of the preferences list. Factors such as the fishers' inadequate relations with the academy and the ministry, choosing to avoid these two institutions or having problems with these institutions may have played a role in this preference. Still, at this stage, they are only assumptions and have no scientific basis. For this reason, future research should focus on the information sources of fishers as well as reasons or factors affecting these preferences.

Curtis et al. (2008) pointed out some drawbacks of the RGT such as being cognitively demanding, being limited to the specified scope, monotony. In RGT rating, ranking, and dichotomizing commonly are used to link alternative and criterion (Tan and Hunter 2002). The reason we use a rating scale in this study is that it is relatively less cognitively demanding compared to the other two methods. It would not be wrong to say that a situation that is less cognitively demand can trigger System 1 (Frankish 2010) and offer clues on the irrationality of the behavior.

Individuals consider resource preferences in the early stages of the information-seeking process. Decisions for questioning the suitability of information are made in the process of using the next stage of information (Savolainen 2008). However, the information behavior on decision making has been a controversial issue because of cognitive bias (Allen 2011). When a reasoned choice is made by a reasonable individual using relevant information about the advantages and disadvantages of all the possible courses of action, in accord with the individuals' beliefs, there is an informed decision (Bekker et al. 1999). Therefore, it is not possible to talk about a pattern that will suit every segment of society in information preferences. Hence, another issue that should be emphasized in future studies on determining fishers' information source preferences should be taking into account the cognitive biases (Thaler and Sunstein 2008) and other psychographic features such as personal values and attitudes of fishers.

Conclusion

Consequently, while developing policy interventions for fishers' information behavior, it may be advisable to do this through other fishers (leader fishers, reputable fishers) among fishing cooperatives. The peer effect among fishers is observed as a significant phenomenon (Felthoven et al. 2014). Institutional stakeholders who work in the study area can initiate information campaigns to close information gaps of fishers by focusing on those leaders and reputable fishers in cooperatives. In this way, access to accurate, correct and usable information of the fishers' community in the region can be provided. It is thought that the results obtained from the research will benefit NGOs, policymakers, and researchers to improve acceptable, less costly, and applicable policy interventions for supporting sustainable fisheries man-

agement. Besides, the Ministry of Agriculture and Forestry, which is officially responsible for fisheries management, and the Coast Guard Command, which carries out protection-control-surveillance services, are among the leading institutions that can benefit from the outputs of the presently reported study. Besides, as required by terms of references, both institutions should continuously inform fishers.

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