http://www.egejfas.org
Ege Journal of Fisheries and Aquatic Sciences, 42(3), 191-200 (2025)

Su Ürünleri Dergisi (2025)
DOI: 10.12714/egejfas.42.3.01

RESEARCH ARTICLE ARAŞTIRMA MAKALESİ

An assessment of target markets for Türkiye's sea bass (*Dicentrarchus labrax*) exports: The CAPMA technique approach

Türkiye'nin levrek (*Dicentrarchus labrax*) ihracatı için hedef pazarların değerlendirilmesi: CAPMA tekniği yaklaşımı

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Received date: 08.04.2025 *Accepted date: 16.06.2025*

How to cite this paper:
Aydemir, M.F. (2025). An assessment of target markets for Türkiye's sea bass (*Dicentrarchus labrax*) exports: The CAPMA technique approach. *Ege Journal of Fisheries and Aquatic Sciences, 42*(3), 191-200. https://doi.org/10.12714/egejfas.42.3.01

Abstract: Türkiye is the global leader in sea bass (*Dicentrarchus labrax)* production and ranks second in exports. While sea bass is Türkiye's most exported fish, it is crucial to enhance this export to provide greater economic value and ensure the sustainability of production and exports. Therefore, exploring alternative markets is essential. This study aims to evaluate, compare, and classify alternative markets with the potential to boost Türkiye's sea bass exports. For this purpose, a relatively new multi-criteria decision-making (MCDM) method, the Classification Approach of Potential Market Alternatives (CAPMA) technique, was used in the study. The study encompassed a comprehensive analysis of 30 alternative markets, evaluated against five criteria, and categorized into four groups based on their capacity to enhance export volumes. The analysis identified nine countries (Sweden, France, Poland, Hong Kong, Japan, China, Thailand, the United States (US), and Malaysia) with the highest potential to increase Turkish sea bass exports. Six countries (Germany, Denmark, Finland, Singapore, Brazil and Canada) were identified as other countries where export potential is important to ensure country diversification, which is important for Türkiye's sustainable sea bass production and exports.

Keywords: Sea bass, *Dicentrarchus labrax,* potential market, CAPMA, export analysis

Öz: Türkiye, levrek (*Dicentrarchus labrax)* üretiminde dünyada lider, ihracatında ise ikinci sırada yer almaktadır. Levrek, Türkiye'nin en çok ihracat ettiği balık olmakla birlikte, bu ihracatın artması, ekonomik açıdan daha fazla değer sağlaması ve üretimin ve ihracatın sürdürülebilir olması büyük önem arz etmektedir. Bu nedenle farklı alternatif pazarlara ihtiyaç duyulmaktadır. Bu doğrultuda çalışmanın amacı, Türkiye'nin levrek ihracatının ihracat hacmini artırma potansiyeline sahip alternatif pazarları değerlendirmek, karşılaştırmak ve sınıflandırmaktır. Bunun için çalışmada oldukça yeni çok kriterli karar verme (ÇKKV) yöntemi olan potansiyel pazar alternatiflerinin sınıflandırma yaklaşımı (CAPMA) tekniği kullanılmıştır. Mevcut çalışmada, 30 alternatif pazar ve beş kritere göre analiz edilmiş ve ihracat hacmini artırma potansiyellerine göre dört grupta kategorize edilmiştir. Sonuç olarak, dokuz ülke (İsveç, Fransa, Polonya, Hong Kong, Japonya, Çin, Tayland, ABD ve Malezya) Türkiye'nin levrek ihracatında, ihracatını arttırmada en yüksek potansiyele sahip olan pazarlar olarak belirlenmiştir. Altı ülke (Almanya, Danimarka, Finlandiya, Singapur, Brezilya ve Kanada) ise Türkiye'nin sürdürülebilir levrek üretimi ve ihracatında önemli olan ülke çeşitliliğini sağlamak için ihracat potansiyelinin önemli olduğu diğer ülkeler olarak tespit edilmiştir.

Anahtar Kelimeler: Levrek, *Dicentrarchus labrax*, potansiyel pazar, CAPMA, ihracat analizi

INTRODUCTION

The global trade of aquaculture products is experiencing a marked increase. Indeed, seafood has emerged as the fastest-growing food commodity trade (Aanesen et al., 2023). Seafood's growing prominence as a substitute for red meat is becoming increasingly evident, underscoring its role in promoting healthier lifestyles (Kam et al., 2024; Xia et al., 2024). Aquaculture products have been identified as a catalyst for economic growth in numerous countries, playing a pivotal role in ensuring global food security (Balcı Akova and Kahraman, 2021; Demirci et al., 2024). The trade in fisheries and aquaculture products has been shown to contribute substantially to the economic growth of numerous developing countries, providing economic opportunities and export income (Can et al., 2020; FAO, 2023; Eminçe Saygı, 2024). Aquaculture products and those derived from fishing form the foundation of the aquaculture trade. In Türkiye, aquaculture products in aquaculture production surpassed the products obtained from fishing in 2020 (Aydemir, 2024). In 2023, Türkiye's aquaculture production exhibited a substantial increase of 18.6% compared to the previous year, reaching over 1 million tons. Conversely, the production obtained from fishing exhibited a more pronounced increase of 39.4%, while aquaculture production increased by a comparatively modest 7.6%. The total yield from fishing activities amounted to 454 thousand tons, with 387 thousand tons being derived from marine fisheries and 67 thousand tons from inland waters. Consequently, aquaculture production accounted for 55% of Türkiye's total aquaculture production, with a value of 554 tons. Notably, 72.1% of aquaculture production was derived from marine sources, while 27.9% originated from inland waters. In terms of aquaculture production, sea bass (*Dicentrarchus labrax*) production reached 161 thousand tons in 2023, while sea bream (*Sparus aurata*) and trout (*Oncorhynchus mykiss*) production was 154 thousand tons (TurkStat, 2024). Türkiye has allocated significant attention to the aquaculture of these fish species, thereby attaining the distinction of becoming the second-largest aquaculture country in Europe (Aydın et al., 2025). While aquaculture-based fish production is prominent in Türkiye's exports, aquaculture products obtained from fishing have mostly gone to domestic consumption. In 2023, Türkiye exported aquaculture products to 103 countries worldwide (Demirci et al., 2024) and became the ninth-largest exporter in the world (Trade Map, 2025). The export value of live fish from Türkiye was recorded at 695 million US dollars, with Russia (14.3%), Italy (11.8%), Greece (9.8%), the Netherlands (7.8%), the United Kingdom (UK) (7.7%), and Japan (7.6%) being the primary exporters (Trade Map, 2025; TurkStat, 2025).

Türkiye's most exported live fish in 2023 was sea bass (TurkStat, 2025). In 2023, Türkiye accounted for 28.6% of global sea bass exports, positioning it as the second largest exporter after Greece (Fernández Polanco et al., 2024; Trade Map, 2025). Despite its global preeminence in sea bass production, as evidenced by its top ranking in global production (Ulusoy et al., 2024; Zoli et al., 2023), Türkiye's sea bass production is partly used for domestic consumption (Asche et al., 2022). Conversely, despite producing a comparatively smaller quantity of sea bass, Greece has a notable export orientation, with a substantial portion of its production being destined for international markets (FAO, 2024a). The export value of sea bass from Türkiye was recorded to be 260 million US dollars. The countries to which Türkiye exported the most sea bass were the UK (33.8 million USD), Italy (33.5 million USD), the United States (US) (30.7 million USD), the Netherlands (25.1 million USD) and Greece (23.5 million USD), respectively (Trade Map, 2025).

The sea bass market which is attracting more and more attention worldwide, is projected to have high growth potential (6.8% compound annual growth rate) (Straits Research, 2025). However, organic production is becoming increasingly important in sea bass production, and the market is expected to expand further in this direction (Mauracher et al., 2013). Increasing consumer demand for high-protein and low-calorie foods is also influencing the growth of the sea bass market (Divu et al., 2024). On the other hand, increasing vegan consumption is restraining the further growth of the sea bass market. In addition, increasing marine pollution, especially microplastics, metals, and chemical waste, has a negative impact on sea bass consumption (Montero et al., 2022). The safety of sea bass produced and exported in Türkiye in terms of public health is a very important issue in terms of increasing sea bass production and exports and ensuring its sustainability (Ulusoy and Mol, 2022). Increasing sea bass production supports economic development while paving the way for people to eat healthier.

Increasing sea bass exports to ensure the sustainability of sea bass production is very important for Türkiye as a major sea bass exporter. Although Türkiye exports a significant part of its sea bass to certain countries (the UK, Italy, the US, Netherlands and Greece), the concentration of sea bass exports is quite low when considering all exporting countries (Trade Map, 2025). However, country diversification is crucial for the continued success of sea bass exports. This is because concentration in certain markets increases price pressure on the product as the saturation of those markets increases (Bjørndal et al., 2019). Reducing price pressure, reducing dependence on specific countries, making exports more sustainable, and using resources more efficiently and effectively play an important role in increasing and sustaining sea bass production. In this regard, it has become more important than ever to identify target markets where Türkiye can increase its sea bass exports.

The initial investigation into Türkiye's potential for aquaculture exports was conducted by Çelik and Akmermer (2022). The study revealed that Japan is the optimal target market for Türkiye's trout and sea bass exports, while Russia is the ideal target market for sea bream. Notably, numerous studies have been conducted on the export target market potential, employing a variety of multi-criteria decision-making (MCDM) methods. These studies include hygienic products, cosmetics and medical devices (Górecka and Szałucka, 2013), frozen beef (Cano et al., 2017), fresh fruits and vegetables (Tosun, 2017), dairy products (Zakeri et al., 2020), textiles (Vanegas-López et al., 2021), confectionery products (Baena-Rojas et al., 2022), cold storage and pre-cooling systems (Akpınar and Metin, 2023), coffee (Baena-Rojas et al., 2023), paper and paperboard (López-Cadavid et al., 2023), fiberboard (Yeşilkaya and Çabuk, 2023), agricultural products (Atlı, 2024), tuna (Oey and Soewandi, 2024), iron and steel (Özekenci, 2024), and footwear (Öztürkçü and Aydemir, 2024).

The present study focuses on target markets with the potential to increase Türkiye's sea bass exports using the Classification Approach of Potential Market Alternatives (CAPMA), a relatively new method. In contrast to other MCDM methods, the CAPMA approach emphasizes classifying potential market alternatives based on exports rather than conventional criteria. To our knowledge, only two studies, hazelnut (Baki, 2023) and fig (Baki, 2024), have employed the CAPMA technique to date. The objective of this study is to identify target markets where Türkiye can increase sea bass exports. The present study evaluates 30 different countries with the highest fish imports in the world and five criteria as sea bass alternatives. The current study is noteworthy for its comprehensive scope, encompassing a diverse portfolio of countries, and its utilization of a novel MCDM method based on direct export-oriented criteria. The study's findings not only assess the potential for enhancing exports in existing markets but also identify new markets as prospective target areas for sea bass exports. The analysis identified target markets with both low export potential and high export potential.

MATERIALS AND METHODS

This study utilizes the Trade Map database to obtain export and import data. The Trade Map database provides detailed information on import and export data for products by country and Harmonized System (HS) code. Trade Map (2025) foreign trade data for 2023 was utilized due to the absence of data for

2024. Since Russia, the country to which Türkiye exports the most sea bass, is ranked 30th in the list of countries importing the most fish (Trade Map, 2025), 30 target countries were identified within the framework of the world's top fish-importing countries in order to determine the target market potential of Türkiye's sea bass exports. These countries include Sweden, the US, France, Poland, Italy, Spain, Denmark, China, the Netherlands, the UK, Brazil, Germany, Portugal, Hong Kong, Thailand, Finland, Korea, Lithuania, Canada, Norway, Japan, Taiwan, Belgium, Malaysia, Ukraine, the United Arab Emirates (UAE), Singapore, Saudi Arabia, Greece, and Russia.

Sea bass is predominantly traded as live fish, while frozen trade has been virtually non-existent (Asche et al., 2022). Therefore, the four-digit HS code 0302 "Fish, fresh or chilled" was considered. This code encompasses a six-digit classification system, categorizing 59 distinct fish species. In this study, however, the focus was narrowed to six fish species that Türkiye exports the most (99.3%) and have a significant place in world trade (84.5%). These six fish species include sea bass, sea bream, trout, unspecified fish, tuna, and salmon. Among these fish species that are important in the fish trade, fish species other than sea bass were taken into account to determine the market potential of the target country. In other words, by the CAPMA technique, import values of sea bream, trout, bluefin tuna, unspecified fish, and salmon were considered. Furthermore, to ascertain the export potential of sea bass from Türkiye to the target markets, the export values of sea bass to these countries were incorporated.

The present study utilizes a relatively new technique, the CAPMA, to identify target markets that have the potential to increase Türkiye's sea bass exports. The CAPMA technique is distinct from other MCDM methods in the literature. It focuses on evaluating, comparing, and classifying potential market alternatives specifically according to exports rather than traditional criteria. For this reason, the CAPMA technique was preferred. The Classification Approach of Potential Market Alternatives (CAPMA) technique was developed by Baki (2023). This technique was designed to evaluate, compare, and classify alternative markets according to their potential. It involves calculating the classification coefficient and classifying alternatives into four groups according to their potential (Baki, 2024). The method is based on the ENTROPI method for determining the weights of criteria and the ARAS technique for evaluating alternatives. Initially, CAPMA calculates the utility of the alternatives. Then, classification coefficients obtained by comparing potential market outputs with the current market situation are applied. Therefore, the market alternatives are then categorized into four groups: those with a high potential to increase exports (G1), those with a potential to increase exports (G2), those with only a partial potential to increase exports (G3), and those whose current exports should be maintained (G4). This technique is based on the assumption that an organization purchasing a substitute product or service has the potential to purchase the product or service of interest (Baki, 2024).

The steps of the CAPMA technique are as follows (Baki, 2023; Baki, 2024):

Step 1. According to Equation (1), the elements of the decision matrix (x_{ij}) are converted to the elements of the normalized decision matrix ($\bar{x}_{ij}$).

$$\bar{x}_{ij} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}} \qquad (1)$$

Step 2. The (k) value is derived using Equation (2). The entropy (E_j) values are calculated using Equation (3).

$$k = \frac{1}{ln(n)} \qquad (2)$$

$$E_j = -k.\sum_{j=1}^{n} \bar{x}_{ij}\, .\, ln\, p_j \qquad (3)$$

Step 3. The (d_j) value, expressed as the degree of differentiation provided by a criterion, is obtained using Equation (4). This value indicates the contrast intensity inherent in a criterion.

$$d_j = 1 - E_j \qquad (4)$$

Step 4. The calculating weights of criteria (w_j) is based on Equation (5).

$$w_j = \frac{d_j}{\sum_{j=1}^{n} d_j} \qquad (5)$$

Step 5. Weighted normalized decision matrix values ($\hat{x}_{ij}$) are obtained by multiplying the values in the normalized decision matrix with the weights of criteria calculated according to Equation (6).

$$\hat{x}_{ij} = \bar{x}_{ij} w_j \qquad (6)$$

Step 6. The alternatives' optimal function values (S_i) are obtained with Equation (7). The ideal optimal function value (S_0) is calculated by summing the highest values available for each criterion, as outlined in Equation (8).

$$S_i = \sum_{j=1}^{n} \hat{x}_{ij} \qquad (7)$$

$$S_0 = \sum_{j=1}^{n\Sigma} \hat{x}_{ij}^{max} \qquad (8)$$

Step 7. The degree of utility of each alternative (K_i) is calculated according to Equation (9). The high utility degree of an alternative is an indication of its effectiveness.

$$K_i = \frac{S_i}{S_0} \qquad (9)$$

Step 8. According to Equations (10) and (11), the current market rates (CM_i) and potential market rates (PM_i), of the alternatives are determined respectively. In this context, (E_i) denotes the export of the current alternative. The calculation of the classification coefficient (CC_i) - which indicates the potential of alternatives to increase market share - is performed in accordance with the specified formula, Equation (12).

$$CM_i = \frac{E_i}{\sum_{i=1}^{m} E_i} \qquad (10)$$

$$PM_i = \frac{K_i}{\sum_{i=1}^{m} K_i} \qquad (11)$$

$$CC_i = PM_i - CM_i \qquad (12)$$

Step 9. The alternatives are grouped according to their potential to increase exports. This potential is measured by the calculation outlined in Equation 13.

$$CC_i \geq 0.03 \Rightarrow G1 \qquad (13)$$

$$0.03 > CC_i \geq 0.01 \Rightarrow G2$$

$$0.01 > CC_i \geq 0 \Rightarrow G3$$

$$0 > CC_i \Rightarrow G4$$

RESULTS

Evaluating alternative markets for Türkiye's sea bass exports is crucial for the country's competitiveness in this product. When new market opportunities arise, exporters can no longer focus solely on specific markets. Instead, they have the opportunity to target other markets more accurately thanks to the new market options. It is crucial for exporters to prioritize markets with high export potential while considering those with relatively lower potential as part of a diversified strategy. This approach enables exporters to allocate resources more efficiently, enhance profit margins through reduced price pressure, and mitigate risk through market diversification. This strategic approach paves the way for exploring more suitable markets. The findings are presented in accordance with the application steps of the CAPMA technique. In Table 1, the import values by fish species of the countries that import the most fish are shown in the decision matrix to apply the CAPMA technique.

Table 1. Decision Matrix

Country	Sea bream (thousand USD) C1	Trout (thousand USD) C2	Bluefin Tuna (thousand USD) C3	Unspecified fish (thousand USD) C4	Salmon (thousand USD) C5
Sweden	1,130	45,918	403	12,834	4,152,238
The US	23,598	57,938	131,405	392,786	1,346,221
France	85,711	52,474	4,236	115,695	1,256,108
Poland	1,983	78,964	3	759	1,666,232
Italy	246,306	9,269	5,650	133,567	682,196
Spain	181,698	3,719	22,005	156,597	548,917
Denmark	1,779	7,432	165	32,098	971,461
China	0	2,592	29,863	0	1,059,487
Netherlands	39,608	8,232	5,780	39,801	498,672
The UK	24,097	1,038	7,709	22,704	633,992
Brazil	0	4	1,492	12	751,812
Germany	35,390	18,280	394	26,942	392,746
Portugal	89,009	352	1,278	52,575	91,786
Hong Kong	19,195	65	1,864	246,513	111,284
Thailand	3,061	51,365	2,467	87,735	198,075
Finland	203	37,199	0	709	311,001
Korea	72	96	3,920	2,165	274,193
Lithuania	1,328	6,054	14	1,191	250,755
Canada	10,977	5,446	8,290	35,099	97,483
Norway	699	1,306	178	3,078	2,163
Japan	0	7,701	45,396	23,144	121,570
Taiwan	1,246	5,611	8	26,015	172,101
Belgium	6,562	4,694	669	15,862	72,406
Malaysia	298	34,810	5	148,202	6,724
Ukraine	9,448	58,241	131	576	125,323
The UAE	33,980	1,003	3,613	20,830	83,032
Singapore	4,479	10,150	1,471	50,408	46,242
Saudi Arabia	150	11,663	4	2,295	58,950
Greece	36,171	896	1,353	26,811	33,437
Russia	14,231	110,592	173	622	0

Source: Trade Map (2025)

As illustrated in Table 1, the world's leading importers of sea bream, trout, bluefin tuna, unspecified fish, and salmon have been identified. It is understood that countries primarily import salmon. Unspecified fish and sea bream ranked second and third, respectively. According to import values, trout ranked fourth, and bluefin tuna ranked last. In accordance with the data presented in the decision matrix, the criteria weights were initially calculated and subsequently displayed in Table 2.

Table 2. Weights of criteria

	C1	C2	C3	C4	C5
e_j	0.990	0.989	0.991	0.990	0.990
d_j	0.010	0.011	0.009	0.010	0.010
w_j	0.199	0.216	0.184	0.204	0.197

Source: Author's calculations.

As shown in Table 2, the criteria weights are arranged from highest to lowest, with trout given the highest priority, followed by unspecified fish, sea bream, salmon, and bluefin tuna. Utilizing these criteria weights, calculations for existing and potential markets were conducted, resulting in the creation of Table 3.

Table 3. Comparison of the current and potential market situations of alternatives (E_i: Türkiye's export value of sea bass (thousand USD), R_c: Current ranking, R_p: Potential ranking, R_*: Difference between current ranking and potential ranking)

Country	E_i	CM_i	R_c	PM_i	R_p	CC_i	R_*
Sweden	0	0.000	17	0.069	5	0.069	12
The US	30,727	0.145	3	0.176	1	0.031	2
France	3,556	0.017	10	0.070	4	0.053	6
Poland	53	0.000	16	0.048	6	0.048	10
Italy	33,467	0.158	2	0.088	2	-0.070	0
Spain	18,122	0.085	6	0.083	3	-0.003	3
Denmark	0	0.000	17	0.019	18	0.019	-1
China	0	0.000	17	0.034	10	0.034	7
Netherlands	25,103	0.118	4	0.027	14	-0.092	-10
The UK	33,803	0.159	1	0.021	17	-0.138	-16
Brazil	0	0.000	17	0.010	24	0.010	-7
Germany	371	0.002	14	0.023	16	0.021	-2
Portugal	8,910	0.042	9	0.029	13	-0.013	-4
Hong Kong	0	0.000	17	0.037	8	0.037	9
Thailand	0	0.000	17	0.033	11	0.033	6
Finland	0	0.000	17	0.017	19	0.017	-2
Korea	0	0.000	17	0.006	27	0.006	-10
Lithuania	372	0.002	13	0.006	28	0.004	-15
Canada	1,097	0.005	12	0.015	20	0.010	-8
Norway	0	0.000	17	0.001	30	0.001	-13
Japan	0	0.000	17	0.037	9	0.037	8
Taiwan	0	0.000	17	0.007	25	0.007	-8
Belgium	0	0.000	17	0.006	26	0.006	-9
Malaysia	0	0.000	17	0.030	12	0.030	5
Ukraine	3,441	0.016	11	0.024	15	0.008	-4
The UAE	15,361	0.072	7	0.014	21	-0.058	-14
Singapore	73	0.000	15	0.012	23	0.012	-8
Saudi Arabia	0	0.000	17	0.005	29	0.005	-12
Greece	23,453	0.111	5	0.013	22	-0.097	-17
Russia	14,198	0.067	8	0.041	7	-0.026	1

Source: Author's calculations.

As shown in Table 3, the ranking of existing and potential markets for Türkiye's sea bass exports is as follows. (E_i) denotes Türkiye's sea bass exports to each alternative country, and (CM_i) represents the ratio of alternative countries to the total sea bass export value. (PM_i) indicates the potential market share of alternative countries. Finally, by obtaining the difference between (PM_i) and (CM_i) values, the classification coefficient (CC_i) is obtained. The alternative country rankings and groupings created with (CC_i) are presented in Table 4.

Table 4. Classification of alternative markets according to their group (G1: Group 1, G2: Group 2, G3: Group 3, G4: Group 4)

G1		G2		G3		G4	
Country	CC_i	Country	CC_i	Country	CC_i	Country	CC_i
Sweden	0.069	Germany	0.021	Ukraine	0.008	Spain	-0.003
France	0.053	Denmark	0.019	Taiwan	0.007	Portugal	-0.013
Poland	0.048	Finland	0.017	Belgium	0.006	Russia	-0.026
Hong Kong	0.037	Singapore	0.012	Korea	0.006	The UAE	-0.058
Japan	0.037	Brazil	0.010	Saudi Arabia	0.005	Italy	-0.070
China	0.034	Canada	0.010	Lithuania	0.004	Netherlands	-0.092
Thailand	0.033			Norway	0.001	Greece	-0.097
The US	0.031					The UK	-0.138
Malaysia	0.030						

Source: Author's calculations.

As indicated in Table 4, alternative countries were evaluated in four distinct groups according to their potential. The analysis yielded nine countries that were identified as the markets with the highest export potential for increasing their exports. These countries include Sweden, France, Poland, Hong Kong, Japan, China, Thailand, the United States, and Malaysia.

Germany, Denmark, Finland, Singapore, Brazil, and Canada have been identified as other countries with high export potential for Türkiye.

DISCUSSION

The present study presents a comprehensive market portfolio of 30 countries for Türkiye's sea bass exports. The use of a new MCDM method based directly on export-oriented criteria makes this study attractive. However, according to the CAPMA technique used, only the data for 2023 are considered. Due to the nature of the technique, one of the most significant limitations of the study is the use of Türkiye's sea bass export data and import data of substitute fish species (sea bream, trout, unspecified fish, tuna, and salmon) to reveal the export potential. Notably, the exclusion of data on animal consumption habits, production, and demand structure within respective countries represents a significant constraint in the analysis. Within this context, nine countries in Group 1 have been identified as the markets with the highest export potential for Türkiye's sea bass exports. Sweden stands out as the most significant potential market, contrasting with Çelik and Akmermer (2022) findings. However, it is noteworthy that Sweden, the world's largest fish importer in 2023, has maintained relatively low sea bass imports. While Türkiye primarily exports sea bass and other fish products to EU countries, it has not yet entered the Swedish market. This underscores the need for targeted promotion and marketing initiatives to promote Turkish fish products, particularly sea bass, in the Swedish market. Given the high value per ton of imported fish and Sweden's inability to produce sea bass due to climatic conditions (Krzykawki and Więcaszek, 1997), this market holds significant potential. At the same time, Swedish consumers are less price-sensitive when it comes to animal products, while the importance attached to organic certified products, animal welfare, health and nutrition, and food safety is quite high (Ammann et al., 2024). Consequently, it is recommended that Türkiye prioritize the Swedish market for sea bass exports.

France is the second most important country with the potential to increase Türkiye's sea bass exports. France ranks fourth in the world in sea bass imports. While this finding aligns with Çelik and Akmermer (2022), the current study indicates that Türkiye has a greater capacity to augment its sea bass exports to France. While the UK, Italy, and Spain are among the countries with the highest sea bass exports, France is lagging behind. In addition, French consumers attach great importance to freshness, the origin of the product, whether it is obtained from fishing or aquaculture, and the date of harvest (Masi et al., 2022). Considering these factors, focusing on the French market can provide significant advantages for Turkish sea bass exporters.

Poland, the world's fourth largest fish importer, imports negligible sea bass. Poland's imports of sea bass account for 5.8% of its total fish imports, with Türkiye being its primary supplier. Poland has emerged as a significant potential market, ranking third in sea bass imports. Sea bass production in Poland is hindered by the country's climatic conditions, which are not conducive to sea bass cultivation (Krzykawki and Więcaszek, 1997). Poland is experiencing significant economic growth and has a relatively young population. However, fish consumption among younger demographics is lower compared to that of adults (Utri-Khodadady and Głąbska, 2023). Notably, Poland's fish consumption is predominantly driven by salmon (Utri-Khodadady et al., 2024). To address this, there is a need for increased promotion of sea bass as a substitute product. Furthermore, educational level, economic status, and place of residence should be taken into account in sea bass exports to Poland (Stoś et al., 2024).

Hong Kong is one of the world's largest importers of fish. It is also one of the countries with the highest annual per capita consumption of fish (World Population Review, 2025). Hong Kong, identified as the fourth most important potential market, imports less sea bass than other fish species (Trade Map, 2025). In addition, consumers in Hong Kong are more influenced by changing global trends, with Western culture dominating dietary trends more than Chinese culture (Wong et al., 2019). In parallel, the spread of diet culture, increased meat consumption, and awareness of healthy living may create the potential for higher sea bass consumption with the effect of higher income. At this point, more market research is needed before exporting sea bass to the Hong Kong market.

Japan, the world's 21st largest fish importer, currently imports a very low volume of sea bass. Japan, which imports 0.2% of its total fish imports from Türkiye, has significant potential for increasing its exports of Turkish fish. While Türkiye's share of Japan's fish imports is modest, it ranks as the eighth-largest destination for Turkish fish exports. Recent increases in trout exports from Türkiye to Japan (Dağtekin, 2024) also suggest the potential for sea bass exports to this country. Furthermore, a study by Çelik and Akmermer (2022) identified Japan as the foremost potential market for Türkiye's sea bass exports. In this study, it was identified as a significant potential market. However, several factors limit the viability of this market. These include the geographical distance between Japan and Türkiye, Japanese consumers' interest in domestic products (Sasaki et al., 2022), Malaysia's competitive pricing, and Japan's lack of interest in sea bass. On the other hand, the high unit value of Japan's fish imports provides a valuable opportunity to tap into this market. To tap this potential, it is imperative to implement strategic marketing and promotional initiatives specific to the Japanese market, prioritizing the quality, safety and assurance that Japanese consumers value.

China is the world's largest producer and exporter of aquaculture products (FAO, 2024b). At the same time, its growing domestic consumption is increasing the country's need for imports every day. While China is a global leader in many fish products (Yue et al., 2024), it is also an importer of certain fish products, including sea bass. At the same time, China's growing middle class is turning to higher-priced seafood (FAO, 2024b). Although sea bass consumption is growing in popularity in China (Ying et al., 2024), Türkiye has not yet exported enough to meet demand. In addition, taste, quality, food safety, environmental impact, and certified products play an important role in Chinese fish consumption (Xu et al., 2024). Considering these, it is recommended to focus more on the Chinese market.

Thailand is among the most important producers of Asian sea bass (*Lates calcarifer*) (Raharjo et al., 2022) and is among the countries with low imports of sea bass. Significant progress has been made in Thailand's tourism sector in recent years. The country has witnessed a consistent rise in international tourist arrivals, with the number of visitors increasing daily. In 2023, Bangkok, the capital of Thailand, was recognized as one of the world's top tourist destinations. The rising interest among European tourists in Thailand may positively impact Turkish sea bass exports to this country. Furthermore, the demand for seafood consumption in Thailand is increasing day by day, and the importance of aquaculture has increased due to the unsustainability of aquaculture products obtained from fisheries (Sampantamit et al., 2021). However, considering the environmental conditions, there may be an opportunity for Türkiye to export sea bass.

The US is a major player in the global seafood market, importing more seafood than any other country. It is also the world's second-largest importer of sea bass. The US ranks eighth in Türkiye's fish exports and third in sea bass exports. Over the past five years, the US has experienced a notable surge in sea bass imports from Türkiye, with an 11% increase, making it one of the countries with the highest growth in sea bass imports from Türkiye. A thorough assessment of the potential for increasing exports to this market suggests that the US could become Türkiye's leading sea bass export destination in the future. This finding aligns with the research by Çelik and Akmermer (2022). However, to increase the export of sea bass to the US market, it is necessary to prioritize the factors of the utmost importance to US consumers, including quality, source, and packaging (Agyeman et al., 2025).

Malaysia is among the world leaders in per capita fish consumption, with an annual consumption of approximately 50 kilograms per person (ReportLinker, 2024). Malaysia is the ninth largest sea bass exporter worldwide. Malaysia's animal consumption trends are influenced by education, ethnicity and religion rather than income. Thus, while fish consumption remains high, there is a growing interest in chicken consumption (Drewnowski et al., 2020). Although Malaysia has emerged as a high-potential market for Turkish sea bass exports, it is thought that efforts to increase exports may not be advantageous because of the low volume of imports and export values.

In Group 2, Germany, Denmark, Finland, Singapore, Brazil, and Canada were identified as other countries with high export potential for Türkiye. These markets have been identified as other important markets for market diversification, especially in terms of Türkiye's sustainable sea bass exports. Conversely, Group 3 includes Ukraine, Taiwan, Belgium, Korea, Saudi Arabia, Lithuania, and Norway as markets with only partial potential to increase exports. Group 4, which includes Spain, Portugal, Russia, the UAE, Italy, the Netherlands, Greece, and the UK, is a group of markets where current exports should be protected. The UK, Italy, the US, the Netherlands, and Greece were among the markets to which Türkiye exported the most sea bass. It is evident that these markets have reached a high level of saturation.

CONCLUSION

Sea bass plays a significant role in Türkiye's fish production and exports. This study sought to identify potential markets for sea bass exports to increase and sustain sea bass production and exports while leveraging resources effectively and efficiently. The analysis identified Sweden, France, Poland, Hong Kong, Japan, China, Thailand, the US, and Malaysia as the markets with the greatest potential for increasing Türkiye's sea bass export capacity. It is recommended that Turkish sea bass producers and exporters direct a more significant portion of their marketing and promotional efforts toward these identified markets. Simultaneously, Germany, Denmark, Finland, Singapore, Brazil, and Canada were identified as other markets with high export potential for Türkiye to ensure market diversification. Given that some of these countries have never previously engaged in sea bass exports, sea bass promotion, and marketing activities must be carried out in these markets.

Türkiye needs not only to diversify its sea bass exports but also to maintain its current market share. In this regard, Türkiye has the potential to enhance its competitiveness in the global market through sustainable production certifications, digital marketing strategies, and logistics collaborations. Furthermore, promotional campaigns should be strategically planned in coordination with TIM (Turkish Exporters Assembly) and prominent aquaculture sector organizations, particularly for countries demonstrating significant export potential. In doing so, it is essential to consider the impact of income level, healthy living, beliefs, ethnicity, education, cultural structure, awareness, animal welfare, certified products, food safety, quality, origin, packaging, and sustainability trends on fish consumption.

Increasing sea bass exports by developing strategies for different countries makes sea bass production more attractive and contributes to economic development through increased income and employment. However, a higher increase in sea bass exports compared to production may cause a price increase in the domestic market. Furthermore, the accelerated growth in sea bass production has the potential to disrupt the natural ecosystem and diminish the quality of sea bass. Therefore, it is essential to address sea bass production within the framework of sustainability practices to protect the aquatic ecosystem and ensure the continuity of exports.

In future studies, different methods can be applied by adding data on animal consumption habits, production, and demand structure of countries to investigate the export potential of sea bass in more depth. The CAPMA technique used in this study can be applied to other aquaculture products in future studies. In addition, the development and analysis of a hybrid approach using the CAPMA technique in combination with data mining or regression analysis can provide meaningful results for the sector and make significant contributions to literature.

ACKNOWLEDGEMENTS AND FUNDING

This study did not receive any financial support, grant, or assistance from any public, commercial, or nonprofit funding organization. The author thanks the anonymous reviewers for their valuable input during the manuscript review process.

AUTHORSHIP CONTRIBUTIONS

Muhammed Fatih Aydemir: Conceptualization, methodology, investigation, data collection, writing-reviewing and editing.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

ETHICS APPROVAL

No specific ethical approval was necessary for the study.

DECLARATION OF AI USE

We have not used AI-assisted technologies in creating this article.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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