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THE IMPORTANCE OF MARINE RECREATIONAL FISHING TO THE LOCAL AND NATIONAL ECONOMY ON THE EXAMPLE OF THE SEAPORT OF KOŁOBRZEG

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ABSTRACT: This article identifies the importance of marine recreational fishing to the economy of the Koszalin subregion and Poland as a whole. The study behind the paper was limited to the seaport of Kołobrzeg, a harbour of crucial significance for marine recreational fishing. The aim set was accomplished based on survey results and by using the input-output method. The economic impact was analysed by distinguishing between direct, indirect, and induced effects and utilising the three indicators: output value, added value and employment. The study showed that most of the economic benefits are limited to the local economy. Recreational fishing for the Koszalin subregion generates PLN 7.09 million of output value and PLN 3.67 million of added value and provides nearly 43 jobs. For the whole country, these indicators are PLN 10.50 million and PLN 5.03 million, respectively, providing nearly 50 jobs. In a counterfactual scenario based on the higher cod fishing quotas in force until 2019, recreational fishing becomes an important sector of the local economy. The significance of marine recreational fishing in Poland is far lower than in that of the countries adopted for comparison in the study. The future of marine recreational fishing depends on whether Poland's territorial waters can be excluded from the ban on angling and whether the regulations governing the activities of angling vessels can be relaxed.

KEYWORDS: marine recreational fishing, angling tourism, Kołobrzeg seaport, input-output method, local economy

Introduction

Marine recreational fishing is most commonly defined as catching any aquatic animals in the sea (mainly fish) that are not one's staple food and are not for sale (Brocki et al., 2015; Zhao et al., 2022). Although marine recreational fishing is not commercial in nature, as the above definition implies, its importance to the economy is growing, especially in developed countries. The economic impact of marine recreational fishing in Europe in 2016 was estimated at €10.5 billion and provided 100,000 jobs (Hyder et al., 2020; Roberts et al., 2007). The number of marine recreational fishermen in Europe, in turn, is estimated at 8-10 million (Brocki et al., 2015).

In Poland, marine recreational fishing was expected to become an alternative to commercial fishing, experiencing a decline in the wake of dwindling fish stocks, mainly those of cod. The first regular fishing began in the late 1990s and flourished in the 2010s when the angling fleet numbered nearly 120 vessels (Radtke & Dabrowski, 2016). This was accompanied by a simultaneous growth in demand for fishing services among tourists. It is estimated that up to 150,000 tourists would use fishing services annually. The quantities caught were presumably at the level of 1.0 tons – 1.5 tons, which accounted for approx. 10% of the volume of commercial catches (Radtke & Dąbrowski, 2010).

This development of fishing tourism benefited not only the owners of fishing vessels but also seaports and the local economy, i.e., catering and hospitality services and retailers. Marine recreational fishing mitigated the negative consequences of tourism seasonality in coastal towns. It was a showcase for these localities, and the large number of their visitors helped spread their promotion. In 2020, cod fishing quotas began to be introduced, which curbed tourist interest in angling services (Cukiernik, 2024).

The main aim of the paper is to determine the economic importance of marine recreational fishing carried out from the seaport of Kołobrzeg. This is a key port for Polish recreational fishing, where nearly a third of all angling vessels used to be stationed, and the importance of the activity in question is analysed in reference to the Koszalin subregion and Poland as a whole.

The territorial scope includes recreational fishing carried out in the Baltic Sea from fishing vessels. However, it does not include recreational fishing practised in inland waters and individual fishing tourism.

The temporal scope of the study includes 2015-2019 and 2023. In 2015-2019, there was a high cod fishing quota in force. Recreational fishing was popular with tourists. In contrast, 2023 was the fourth consecutive year with a cod fishing quota of one fish in place. This reduced tourist interest in angling trips, and as a result, most of the angling fleet ceased operations.

A survey conducted in January-February 2024 provided information on recreational fishing. It was addressed to all sixteen vessel owners. Eight of them, representing nearly 60% of the fishing potential, completed the survey. In addition, the survey results were confirmed by telephone interviews with the chairman and vice-chairman of the Commercial-Sport Yacht Owners Association.

The economic significance of marine recreational fishing was determined using the input-output method. Such an approach allows us to distinguish between direct, indirect, and induced effects, thus representing the full spectrum of the impact of recreational fishing on the local and national economy. Output value, added value, and employment – the most common indicators used in the literature – were assumed as measures of economic impact.

The Polish literature offers no studies addressing the economic importance of marine recreational fishing. The only authors who studied the analysed issue were Trella and Mickiewicz (2016). However, they are concerned about the Vistula Lagoon, whose conditions for recreational fishing differ from those of the high seas.

Research on marine recreational fishing has so far concentrated on technical issues, i.e., the determination of the quantities caught, the number of tourists, and trip frequencies (Marciniak & Kałuża, 2010; Brocki et al., 2015; Radtke & Dąbrowski, 2016). However, no one has studied recreational fishing from the point of view of economic effects. Admittedly, even the foreign literature does not explore marine recreational fishing frequently. This is especially true of fishing in Europe, where interest in this area has only started in recent years, as discussed in the theoretical part of this paper (Hyder et. al., 2020; Zhao et al., 2022; Akbari et al., 2023). An extensive analysis of the literature carried out by the author did not, however, reveal any study analysing marine recreational fishing as a function of a seaport. As such, therefore, the present study is a novelty. Most of the authors studying

maritime issues focus on cargo handling, which is the dominant type of activity in ports (Coto-Millán et al., 2010; Danielis & Gregori, 2013; Merk et al., 2013; Bottasso et al., 2014; Santos et al., 2018). It is with less emphasis that they discuss tourism activities (Fernández Guerrero et al., 2008; Artal-Tur et al., 2018). The function of recreational fishing remains a poorly examined sphere of seaport activities.

There are five parts to this paper. The first one reviews the literature, with a focus on studies that use the input-output method in assessing the economic importance of recreational fishing. The second part presents the theoretical assumptions of the input-output method and shows how the national input-output table is regionalised. The next part discusses how to estimate economic (direct, indirect, and induced) effects. The fourth part presents and discusses the results of the study. The final part contains calculations for the counterfactual scenario covering the years 2015-2019. A comparative analysis is also shown, where the economic importance of marine recreational fishing in Poland is looked at against the background of other selected countries. The paper concludes with a summary.

An overview of the literature

As mentioned in the introduction, the issue of the economic importance of marine recreational fishing is a popular subject in the literature. In their meta-analysis, Akbari et al. (2023) identified 31 articles on fishing whose authors used the input-output method. Only four of those tackled recreational fishing. West et al. (2019) analysed recreational fishing on a global scale, Kim et al. (2017) did so on a regional scale in South Korea, and Poudel et al. (2017) and Rollins and Lovell (2019) on a regional scale in the US. None of the above authors studied recreational fishing in Europe. Moreover, all these publications were authored between 2015 and 2020, suggesting that the issue of recreational fishing is a new research area.

Scheufele and Pascoe (2022), in a publication addressing quota management, made references to two articles utilising the input-output method. The first of them, by Roberts et al. (2017), assesses the economic contribution of recreational fishing to the English economy. The second is the above-cited publication by Poudel et al. (2017), discussing the economic importance of recreational fishing in the southern states of the USA in 2006 and 2011.

Strehlow et al. (2023) argue that research into recreational fishing has a long tradition in the US but is rare in Europe. Using the input-output method, they studied the impact of marine recreational fishing on the economy of the Mecklenburg-Western Pomerania region and Germany, taking into account resident and non-resident anglers' expenditures. They cited the research of the aforementioned Roberts et al. (2017) and other authors. The latter included Hyder et al. (2020) studying recreational fishing in the UK, Storey and Allen (1993) and Steinback (1999) studying angling in the US in Massachusetts (resident and non-resident spending) and Maine, respectively, using IMPLAN models, Pita et al. (2018) analysing angling in Galicia, Spain, Williams et al. (2020) studying recreational fishing on charter boats in the south coast of England, Borch et al. (2011), Southwick at al. (2018), Herfaut et al. (2013) and Potts et al. (2021), who studied recreational fishing in Norway, New Zealand, France and South Africa, respectively.

In contrast, García-de-la-Fuente et al. (2020) undertook to compare the impact of marine recreational and commercial fishing on the economy of Asturias, Spain.

Zhao et al. (2022), in turn, determined the socioeconomic importance of recreational fishing to China's economy. At the same time, they found that angling was well-documented in developed countries and much less well-documented in developing countries.

The review made within the framework of this study, however, discovered no article examining the importance of recreational fishing as one of the functions of a seaport. Adopting an appropriate research methodology required that a review of papers on seaport tourism be reviewed first. An article by Artal-Tur et al. (2018), in which the authors determined the economic importance of cruise tourism in the port of Cartagena in the Spanish region of Murcia, served as an inspiration for this study. Drawing on literature sources, i.e., key papers utilising the input-output methodology (Dwyer & Forsyth, 1998; BREA, 2013; Worley & Akehurst, 2013), they were able to define the economic effects of cruise tourism.

Research methods

The input-output model is a method allowing for the determination of inter-industry linkages or indirect and induced effects. The indirect effect for output is calculated using a formula referred to as the Leontief. The indirect effect for added value and employment is derived by incorporating the diagonal matrix into the model. Its diagonal is constituted by the added value share and the employment per output coefficients.

The induced effect is derived from the basic input-output model formula by adding an additional row and column to the matrix. The elements in the row represent net income (wages) per unit of output. The elements in the column represent household consumer spending. The induced effect is the difference between the sum of the direct, indirect, and induced effects and the direct and indirect effects. As with the indirect effect, the induced effect for added value and employment is calculated by incorporating the diagonal matrix into the Leontief inverse matrix.

The input-output method in our model makes use of data from input-output tables published in Poland at 5-year intervals (the latest available version is for 2015) (Statistics Poland, 2019). Statistics Poland publishes input-output tables at the national level, which necessitates their adaptation to the regional dimension. Such regionalisation allows for the determination of the target area's self-sufficiency while being the most difficult task within the input-output method. Prior to regionalisation, the input-output table was aggregated from 98 to 19 divisions corresponding to the PCA [PCA – Polish Classification of Activities] 2007 sections. The decision to narrow down the table was dictated by the sort of statistical data available for the Koszalin subregion. In addition, a too extensive disaggregation affects model complexity, thus hindering result interpretation.

National table regionalisation was carried out based on the Flegg location quotient expressed by the following formula (Flegg & Webber, 1997; Flegg & Tohmo, 2010):

$$FLQ_{ij} \equiv CILQ_{ij} \times [log_2 \left(1 + \frac{TRE}{TNE}\right)]^\delta, \tag{1}$$

where:
FLQ_{ij} – Flegg location quotient,
TRE – employment in the region's economy (in all industries),
TNE – employment in the national economy (in all industries).

$$CILQ_{ij} = \frac{SLQ_i}{SLQ_j} = \frac{RE_i/NE_i}{RE_j/NE_j}, \tag{2}$$

where:
RE_i – regional employment in the retailer industry,
NE_i – national employment in the retailer industry,
RE_j – regional employment in the buyer industry,
NE_j – national employment in the buyer industry,
δ – delta parameter, whose value ranges between $(0 < \delta < 1)$.

Location coefficients are most commonly used to regionalise a national table, with the Flegg location quotient demonstrating the highest accuracy in determining the self-sufficiency of regions. The value of the critical parameter δ was adopted based on Flegg and Tohmo's (2010) study of Finland's regions. Consequently, the regression function was estimated for the purpose of determining the value of the δ parameter:

$$ln\ \delta = -1.8379 + 0.33195\ ln\ R. \tag{3}$$

By substituting the "R" parameter with the added value (which is the quotient of the value added for the Koszalin subregion and the country) the value of the δ parameter for the Koszalin subregion was estimated to be 0.2224.

Estimating the economic effects of recreational fishing in the seaport of Kołobrzeg

Direct effect

The direct effect of fishing activities in the port of Kołobrzeg in terms of output value was assumed to be the revenue of fishing vessels, i.e., the price paid by tourists for fishing services. The above-mentioned data were obtained through surveys and in-depth interviews. In the cases of entities which refused to participate in the study, the output value was estimated on the basis of the number of anglers and the prices per trip, data obtained from Kołobrzeg Seaport Authority, and information provided by the participating vessel owners. The price for an angling trip depended primarily on its duration and ranged from PLN 500 per person for a two-day cruise to PLN 1,500 per person for a five-day cruise. In estimating the output value, PLN 600 per cruise per angler was assumed, a price paid for the most popular 2-3 day fishing trips. Taking into account the number of anglers amounting to 3,840, the output value was estimated at PLN 2,304,000 (Table 1). In turn, the added value was assumed at 70%, i.e., PLN 1,612,800, which consisted of salary expenses of 50% and a gross profit of 20% (taxes, health insurance premiums, and compulsory social insurance premiums). Due to their considerable age, the fishing vessels were not subject to depreciation anymore. Employment per fishing vessel amounted to 3 persons plus the shipowner. Consequently, 30 people were employed in the angling industry. All the employees were from the city of Kołobrzeg, as were the vessel owners, except for the owners of two vessels.

Table 1. Direct importance of recreational fishing in the three analysed economic categories in the port of Kołobrzeg in 2023

Values	Economic category		
	Output value (PLN)	Added value (PLN)	Employment (persons)
	2,304,000	1,612,800	30

Indirect effect

The indirect effect is a cycle of economic linkages, and here, it was a consequence of expenditures by the angling vessel operators and the tourists. Information on the spending structure of the angling vessels was obtained through surveys. On the other hand, the structure of the tourists' expenditures was determined based on Statistics Poland data (Statistics Poland, 2023a; Statistics Poland, 2023b), which was confirmed by the respondents. As in the case of the direct effect, data on entities that declined to participate in the survey were assumed based on information obtained from vessel owners who completed the survey questionnaire.

Expenses of fishing vessel owners

Table 2 shows the value and percentage structure of the angling vessel expenses according to the Polish Classification of Activities (GUS, 2007).

As mentioned above, expenditures on the purchase of materials and services, the so-called intermediate consumption, amounted to a mere 30% of the revenues. As for the expenditure structure, Table 2 shows that the cost of repairs and maintenance of the angling vessels was the dominant item (approx. 20%). It should be borne in mind that the vessels owned by the vessel owners had been adapted from regular fishing to recreational angling purposes or purchased on the second-hand market. Some of them were decades old, which made them subject to frequent breakdowns and called for repairs. The cost of purchasing food, beverages and fuel was another important category of expenditure and amounted to 5.0%. This was in relation to the provision of catering services on board the vessels. In turn, the considerable distance to the fishing grounds generated fuel expenses. The next expense item was the cost of energy/electricity/gas/hot water related, among other things, to the

preparation of meals on board the vessels and the consumption of energy while berthed. Surprisingly, little funds were spent on port fees (0.5%), but that was thanks to the preferential charge by Kołobrzeg Seaport Authority, which, in its tariff policy, does account for the poor financial situation of the recreational fishing sector. The small expenditure on promotion (0.5%) was due to its limited impact on shaping the demand for angling services, which in turn was related to the cod fishing quota that was in effect in 2023. No promotional campaign, not even a best-planned one, will increase tourist interest in angling where there is a limit of one cod caught per trip. The insignificant expenditure on financial services of 0.5% showed that any loans for the development of fishing activities had been repaid, and new ones were not being taken out due to the uncertain situation faced by players in the industry caused by the cod fishing quota. A relatively minor role in the cost structure was occupied by accounting expenses, which was due to the scale and form of this business – sole proprietorships with the vessel owners paying the flat tax. As for membership fees in the Commercial-Sport Yacht Owners Association, these accounted for a small share of their operating expenses, reaching approx. 0.2%.

Table 2. Structure of expenditures (in PLN and in %) of fishing vessels in the port of Kołobrzeg in 2023

PCA 2007	Name of section (expenditure)	Expenditure structure	
		PLN	%
A	Costs related to agricultural, forestry, hunting and fishing activities	0	0.0
B	Mining and quarrying	0	0.0
C	Repair and maintenance of fishing/tourist vessels	46080	20.0
D	Expenses on energy, gas, hot water	6912	3.0
E	Water supply and waste collection	0	0.0
F	Expenditures related to port infrastructure reconstruction/expansion	0	0.0
G	Costs of purchasing food and beverages and other products. Fuel expenses.	11520	5.0
H	Port fee costs	1152	0.5
I	Accommodation and food costs	0	0.0
J	Internet connection expenses, purchase of promotional materials	1152	0.5
K	Expenses on insurance, financial, and other services	1152	0.5
L	Real estate activities	0	0.0
M	Costs of accounting, legal services, and market research and expert reports	691.2	0.3
N	Cleaning and security maintenance costs	0	0.0
O	Public administration	0	0.0
P	Expenditure on vocational courses improving skills	0	0.0
Q	Healthcare and social assistance	0	0.00
R	Costs of organizing recreational and sports events	0	0.0
S	Activities in member organizations	460.8	0.2
Total	PCA sections	691200	Total

Anglers' expenses

Estimating anglers' expenses proved much more difficult, as it required making certain assumptions. Their volume depended on the purpose and length of the anglers' stay in Kołobrzeg (beyond the fishing trips alone), the anglers' nationality, the presence of accompanying persons (family members) not participating in angling, and their place of residence (transportation costs).

The sea trips attracted 10% of foreign anglers and 90% of domestic anglers. For foreign tourists, angling was not the main purpose of their stay in the city but was one of many attractions of their

choice. Hence, their spending should not be linked to fishing. However, it was assumed that the fishing trip influenced the choice of location and could extend the stay of an average family of three by a total of two days. The angling trips were one of the considerations made in choosing a vacation destination. In addition, the stays were often extended due to unfavourable weather conditions (stormy weather). During the fishing trips, those who did not participate incurred expenses such as accommodation and food. In addition, our estimates included transportation expenses in proportion to the duration of the fishing trips.

As for the anglers from Poland, 10% (9% of the total number of anglers) of them were from Kołobrzeg. It was assumed that Kołobrzeg residents did not incur any expenses related to the fishing trips, although this cannot be completely excluded, as they might have been required to purchase some equipment used only on such trips. The remaining 90% (81% of the total number of anglers) of the anglers were tourists travelling from outside Kołobrzeg, of whom 10% (8.1% of the total number of anglers) were tourists visiting Kołobrzeg for leisure, for whom fishing was merely one of the many attractions. For this group of anglers, the assumptions made were similar to those made for foreign tourists, i.e., two days of stay in the city associated with fishing, a family of three, and transportation expenses in proportion to the duration of the trips.

The largest group was made up of tourists from outside Kołobrzeg for whom fishing was the only or main attraction – 72.90% of the total number of anglers, which was consistent with the only study conducted on this topic so far (Radtke & Dąbrowski, 2016). It was assumed that half of them came from West Pomeranian Voivodeship and limited their stay in Kołobrzeg to the duration of the fishing trip. As a rule, these anglers came without their families. Thus, their only expenses were transportation costs. The remaining half came from outside West Pomerania and extended their stay in Kołobrzeg by two days. These were anglers with families.

Table 3. Tourist spending (in PLN) related to angling activities in the city of Kołobrzeg in 2023

Groups of tourists	Expenses					
	accommodation	catering	transportation	purchase of goods	other services	Total
Foreign tourists tourism	494	270	25	78	47	914
	189696	103680	9600	29952	18048	350976
Polish tourists tourism	361	197	18	57	34	667
	112271	61267	5598	17727	10574	207437
Polish tourists angling Western Pomerania	0	0	78	0	0	78
	0	0	109 200	0	0	109 200
Polish tourists angling from outside West Pomerania	600	488	214	216	118	1636
	840000	683200	299600	302400	165200	2290400
Total	1455	955	335	351	199	3295
	1141967	848147	314798	350079	193822	2848813

Explanation: the first line – expenses per family or angler; the second line – total expenses of families or anglers; foreign tourists – foreign tourists for whom fishing was one of the many attractions; Polish tourists – tourists staying in Kołobrzeg for whom fishing was one of the many attractions; Polish tourists angling West Pomerania – tourists from the area of West Pomeranian Voivodeship for whom fishing was the main attraction and limiting their stay to the duration of the fishing trips; Polish tourists fishing from outside West Pomeranian Voivodeship – tourists from outside West Pomeranian Voivodeship for whom fishing was the main attraction and extending their stay in Kołobrzeg by two days.
Source: author's work based on the surveys conducted (groups of tourists) and Statistics Poland (2023a; 2023b) (Expenses).

Table 3 summarises the expenses of the four analysed groups of tourists. The largest expenditure was generated by Poles from outside West Pomerania, for whom fishing was the main attraction – PLN 1,636. This was due to the inclusion of transportation costs, as well as three-day expenses of the family and one-day expenses of the angler. The other two groups of tourists were foreigners and Poles, for whom fishing was one of many attractions. Their lower expenditures of PLN 914 and PLN

667, respectively, were due to the inclusion of their families' two-day expenses and, partially, their transportation costs. The lowest expenses were associated with Poles from West Pomerania, for whom fishing was the main attraction – PLN 78, which was due to the inclusion of transportation costs only. The structure of the anglers' expenses was consistent with the findings of Strehlow et al. (2023). In total, tourists' spending on angling in 2023 could amount to PLN 2,848,813.

Table 4 summarises the expenses of all four groups of tourists. These are broken down into four sections, i.e., accommodation and food, transportation, purchase of goods, and other services (cultural and recreational, entrance tickets, etc.).

Table 4. The structure of tourist spending (according to PCA 2007) related to angling in the city of Kołobrzeg in 2023

| PCA 2007 | Name of section (expense) | Expenditure structure | |
		PLN	%
A	Costs related to agricultural, forestry, hunting and fishing activities	0	0
B	Mining and quarrying	0	0
C	Repair and maintenance of fishing/tourist vessels	0	0
D	Expenses on energy, gas, hot water	0	0
E	Water supply and waste collection	0	0
F	Expenditures related to port infrastructure reconstruction/expansion	0	0
G	Costs of purchasing food and beverages and other products.	350079	12.29
H	Port fee costs	314798	11.05
I	Accommodation and food costs	1990114	69.86
J	Internet connection expenses, purchase of promotional materials	0	0
K	Expenses on insurance, financial, and other services	0	0
L	Real estate activities	0	0
M	Costs of accounting, legal services, and market research and expert reports	0	0
N	Cleaning and security maintenance costs	0	0
O	Public administration	0	0
P	Expenditure on vocational courses improving skills	0	0
Q	Healthcare and social assistance	0	0
R	Costs of organizing recreational and sports events	193822	6.8
S	Activities in member organizations	0	0
Total	PCA sections	2848813	100.00

Source: author's work based on the surveys conducted and Statistics Poland (2023a; 2023b).

Induced effect

The last effect was the one related to household consumption expenditures in industries directly and indirectly linked to the operations of the fishing vessels. Before the induced effect could be determined, information was required on the wages of fishing vessel owners and their employees, the wages as per PCA 2007 sections, households' propensity for consumption, and the structure of such expenditures. Information on the wages of fishing vessel owners and their employees was gathered through surveys. In the case of entities who refused to participate in the surveys, the wages were assumed by analogy to information provided by the participating vessel owners. Data on the wages per PCA 2007 sections, the structure of the expenditures, and households' propensity for consumption were obtained from Statistics Poland (Statistics Poland, 2023c; Statistics Poland, 2024).

Discussion/Limitation and future research

Tables 5-7 summarise the study results in terms of output value, added value and employment. The direct effect in the case of output value amounted to PLN 2,304,000 (fishing vessel revenues). Given that the majority of vessel owners and all employees came from Kołobrzeg, the direct effect was almost entirely limited to the Koszalin subregion. The indirect effect for both the subregion (PLN 3,362,537) and the country as a whole (PLN 5,524,112) was higher than the direct effect. This was due to the fact that tourist spending – in the first and second economic cycles – was qualified as part of the indirect effect. In contrast, the net indirect effect was lower than the direct effect. For the angling vessels, it amounted to PLN 137,525 and PLN 517,265 for the subregion and Poland as a whole, respectively, with an initial expenditure of PLN 691,200. Similar correlations were found to exist in the case of tourist spending, which was caused by the operation of the multiplier. The latter one, in turn, was affected and determined by the size of intermediate consumption, i.e., the entities' expenditures on goods and services. The significantly lower values of the indirect effect for the subregion indicated a limited self-sufficiency of the local economy. In addition, tourism expenditures had the greatest significance for the indirect effect. The induced effect had a similar significance to the direct effect and a lower significance than the indirect effect – and this was despite the inclusion of the expenses incurred by the vessel owners and their employees. This was due to the lower share of wages in output value. Summarising the impact of recreational fishing on the output value, tourist expenditure on angling in the amount of PLN 2,304,000 generated PLN 3,362,537 and PLN 1,426,686 of indirect and induced effects for the subregion, respectively. This means that every PLN 1.00 spent by tourists brought PLN 2.08 of additional value to the subregion's economy. When related to the national economy, the ratio was even higher at 1.00 to 3.56. It is important to note that this study did not take into account all tourist expenditure components, as it omitted savings, taxes, social and health insurance contributions, and investment expenditure. Including the above variables in the model would increase the magnitude of economic effects.

Table 5. Effects of recreational fishing on output value (PLN) in Kołobrzeg port in 2023

Group studid	Effects					
	Direct	Initial expenditure	Indirect		Induced	
			Subregion	Poland	Subregion	Poland
Fishing vessels	2,304,000	691200	137,525	517,265	181,805	357,772
Tourists	Not applicable	2,848,813	2,848,813 + 376,199	2,848,813 + 2,158,034	921,715	1,754,570
Vessel owners	Not applicable	201,451	Not applicable	Not applicable	74,631	128,596
Employees	Not applicable	670,861	Not applicable	Not applicable	248,535	428,247
Total	2,304,000	4,412,325	3,362,537	5,524,112	1,426,686	2,669,185

The direct effect in the case of added value was PLN 1,612,800, accounting for 70% of output value. The high share of added value indicated the services-related nature of the angling industry. By comparison, the share of added value was 45% for the national economy. Similar correlations existed between indirect and induced effects when comparing added value with output value. Consequently, the added value had a lower impact, i.e., PLN 1 zloty generated PLN 1.27 and PLN 2.12 of value in the subregion and Poland as a whole, respectively.

As for the third of the indicators, 30 people were employed directly in the angling businesses, indicating the highly labour-intensive nature of the industry. There was PLN 76,800 of output value per person employed directly in fishing businesses, while in the national economy, the corresponding relationship was PLN 457,727 per person. The angling industry generated 12.77 and 19.20 jobs in the subregion and the country, respectively. The relatively greater importance of direct employment than that of output value and added value was due to the aforementioned labour intensity of the angling industry.

Table 6. Effects of recreational fishing on added value (PLN) in Kołobrzeg port in 2023

Group studid	Effects					
	Direct	Initial expenditure	Indirect		Induced	
			Subregion	Poland	Subregion	Poland
Fishing vessels	1,612,800	691200	59,933	219,764	54,807	116,511
Tourists	Not applicable	2,848,813	1,564,364	2,329,616	277,859	571,387
Vessel owners	Not applicable	201,451	Not applicable	Not applicable	22,498	41,878
Employees	Not applicable	670,861	Not applicable	Not applicable	74,923	139,461
Total	1,612,800	4,412,325	1,624,297	2,549,380	430,087	869,237

Table 7. The effects of recreational fishing on employment (persons) in the Port of Kołobrzeg in2023

Group studid	Effects					
	Direct	Initial expenditure	Indirect		Induced	
			Subregion	Poland	Subregion	Poland
Fishing vessels	30	691 200	0,31	1,15	0,26	0, 55
Tourists	not applicable	2 848 813	10,40	13,93	1,33	2,71
Vessel owners	not applicable	201 451	not applicable	not applicable	0,11	0,20
Employees	not applicable	670 861	not applicable	not applicable	0,36	0,66
Total	30	4 412 325	10,71	15,08	2,06	4,12

The importance of the angling to the subregion and Poland as a whole was relatively small (a fraction of a percent), as shown in Table 8. Employment was of greater importance, followed by added value, with output value being of least importance, which was consistent with the above comments on labour intensity and the high share of added value. In addition, the importance of recreational fishing would increase if the area of reference were narrowed down to the county, municipality and city levels.

Table 8. Economic importance of Kołobrzeg port's recreational fishing in 2023

Economic category	Economy		Recreational fishing			
	Subregion	Poland	Subregion		Poland	
			value	%	value	%
Output value (PLN million)	51,642	6,943,252	7.09	0.0137	10.50	0.0015
Added value (PLN million)	21,703	2,918,006	3.67	0.0169	5.03	0.0017
Employment (persons)	126,401	15,168,969	42.77	0.0338	49.20	0.0032

The impact of recreational fishing on the economy of the subregion and Poland in the counterfactual scenario

The counterfactual scenario considered the angling services potential of the port of Kołobrzeg in the absence of cod fishing restrictions or with high cod fishing quotas. This had been the situation prior to 2020, to which the assumptions of the scenario under consideration referred. Thus, it was assumed that 40 vessels participated in the angling business. The assumed high demand for angling services increased the frequency of cruises to 120 per year. The price per trip remained unchanged

at PLN 600. The higher revenues increased the share of gross profit to 40%. However, the importance of salaries and wages decreased to 35%, and so did expenses independent of the scale of operations, such as Internet bills and the costs of technical inspections of vessels. It was assumed that the increased demand did not affect the prices of the port services and tourism services in the local economy. The estimation of the economic effects additionally took into account higher profits and salaries (in nominal terms), which lowered households' propensity for consumption.

Tables 9-11 show the impact of angling services on the economy of the subregion and Poland as a whole in the counterfactual scenario. In general, the relationships between the studied economic categories did not change. However, the magnitude of the impact of recreational fishing increased. In the counterfactual scenario, the individual economic categories grew 15- or 16-fold. For example, the direct impact of recreational fishing on output value was PLN 34,560,000, the indirect impact was PLN 51,988,627 and PLN 84,389,419, the induced impact was PLN 20,186,993 and PLN 37,939,114 for the subregion and the whole country, respectively. For every PLN 1 of revenue from angling operations, there was PLN 2.09 and PLN 3.54 of additional value for the subregion's and Poland's economy, respectively. Similar correlations existed between added value and employment both with regard to the 2023 situation and the counterfactual scenario.

Table 9. Effects of recreational fishing on output value (PLN) in the port of Kołobrzeg in the counterfactual scenario

Group studid	Effects					
	Direct	Initial expenditure	Indirect		Induced	
			Subregion	Poland	Subregion	Poland
Fishing vessels	34,560,000	8,640,000	1,689,363	6,410,401	2,294,462	4,503,993
Tourists	Not applicable	44,362,292	44,362,292 + 5,936,972	44,362,292 + 33,616,726	14,241,929	27,144,833
Vessel owners	Not applicable	5,620,585	Not applicable	Not applicable	2,082,260	3,587,905
Employees	Not applicable	4,233,382	Not applicable	Not applicable	1,568,342	2,702,383
Total	34,560,000	62,856,259	51,988,627	84,389,419	20,186,993	37,939,114

Table 10. Effects of recreational fishing on added value (PLN) in the port of Kołobrzeg in the counterfactual scenario

Group studid	Effects					
	Direct	Initial expenditure	Indirect		Induced	
			Subregion	Poland	Subregion	Poland
Fishing vessels	25,920,000	8,640,000	734,797	2,727,910	691,685	1,466,754
Tourists	Not applicable	44,362,292	24,228,625	36,099,368	4,293,348	8,839,891
Vessel owners	Not applicable	5,620,585	Not applicable	Not applicable	627,715	1,168,424
Employees	Not applicable	4,233,382	Not applicable	Not applicable	472,790	880,048
Total	25,920,000	62,856,259	24,963,422	38,827,278	6,085,538	12,355,117

The importance of angling in the counterfactual scenario was much greater: it was eight times higher for employment and nearly sixteen times higher for output value and added value. However, both for the economy of the subregion and Poland as a whole, these values still failed to appear significant (Table 12). It should be remembered, however, that angling only represented a portion of a single division out of 77 divisions included in the input-output table. A proper narrowing of the reference area would significantly increase the importance of the analysed industry. It should also be remembered that the Koszalin subregion housed several other smaller ports where fishing services were provided. If incorporated into this study, they would raise the importance of angling fishing, too.

Table 11. Effects of recreational fishing on employment (persons) in the port of Kołobrzeg in the counterfactual scenario

Group studid	Effects					
	Direct	Initial expenditure	Indirect		Induced	
			Subregion	Poland	Subregion	Poland
Fishing vessels	158	8,640,000	3.82	13.16	3.30	6.95
Tourists	Not applicable	44,362,292	159.58	214.34	20.50	41.91
Vessel owners	Not applicable	5,620,585	Not applicable	Not applicable	2.99	5.54
Employees	Not applicable	4,233,382	Not applicable	Not applicable	2.26	4.17
Total	158	62,856,259	163.4	227.5	29.05	58.57

Table 12. Economic importance of the port of Kołobrzeg recreational fishing in the counterfactual scenario in 2023

Economic category	Economy		Recreational fishing			
	Subregion	Poland	Subregion		Poland	
			value	%	value	%
Output value (PLN million)	51,642	6,943,252	106.74	0.2067	156.89	0.0226
Added value (PLN million)	21,703	2,918,006	56.,97	0.2625	77.10	0.0264
Employment (persons)	126,401	15,168,969	350.45	0.277253	444.07	0.0293

Since the literature lacks papers on marine recreational fishing studied as a port function, it became necessary to estimate its total importance to Poland's economy. The estimates adopted were for a counterfactual scenario, i.e., the situation prior to 2020. In Polish seaports, recreational fishing services were provided by approx. 115 vessels. The average annual number of their trips was approx. 13,000, and the number of participating anglers was approx. 160,000 (Marciniak & Kałuża, 2010; Radtke & Dąbrowski, 2016). With such assumptions, the output value would have been approx. PLN 451 million (EUR 105 million), with an added value of PLN 222 million (EUR 52 million) and an employment figure of 1,277 people. The economic importance of recreational fishing in Poland was lower than its counterpart in Germany, which had EUR 472 million in global output, PLN 214 million in value-added, and 4,534 jobs, respectively, in 2014/2015. Recreational fishing is much more economically important in England, New Zealand, France, and South Africa. In England, recreational fishing generated EUR 2.41 billion in output and created 23,600 jobs (Roberts et al., 2017). Recreational fishing in New Zealand was worth EUR 1.8 billion and provided 8,000 jobs (Southwick et al., 2018). In France, spending on recreational fishing amounted to EUR 1.26 billion (Herfaut et al., 2013). Lastly, in South Africa, it generated EUR 2.0 billion and 94,000 jobs (Potts et al., 2021). In Norway, recreational fishing was of similar importance as in Poland, was valued at EUR 112.8 million, and created 1,800 jobs (Borch et al., 2011). Even a single U.S. state, namely Massachusetts, had an output value of EUR 269 million and provided 19,300 jobs, which was significantly more than in Poland. Summarising the above examples, it appears the economic importance of marine recreational fishing in Poland is not high, although when comparing statistics, one should take into account the length of the coastline, fishing opportunities (with a cod fishing quota applicable in most places in Poland), national traditions, and the level of economic development.

Conclusions

In this paper, the economic significance of marine recreational fishing for a subregion and the whole country was determined. The economic relationships were analysed by distinguishing between direct, indirect, and induced effects based on three indicators, i.e., output value, added value, and employment. For the Koszalin subregion, the output value of angling services amounted to PLN 7.09 million and the added value to PLN 3.67 million, with employment reaching nearly 43 people. For the country, the corresponding indicators were PLN 10.50 million, PLN 5.03 million, and nearly 50 jobs. The indirect effect had the greatest significance, which was associated with the impact of tourist spending on the local economy. The significant value of the induced effect (exceeding the direct effect for the whole country) was due to the stimulating effect of wages on the economy.

As studied herein, the angling services were characterised by a high share of added value: approx. 70%. At the same time, it was a labour-intensive sector of the economy. The importance of angling services for the subregion and the whole country was low.

In the counterfactual scenario, taking into account the higher cod fishing quotas that were in force until 2019, the importance of the analysed sector increased more than tenfold. On the scale of the subregion, the output value was PLN 106.74 million, the added value was PLN 56.97 million, and employment was close to 351 people. The analogous values for the whole country were PLN 156.89 million, PLN 77.10 million, and over 444 jobs, respectively. The importance of recreational fishing for the subregion increased, as well, accounting for 0.2067% of the output value, 0.2625% for the added value, and 0.2772% for employment. In assessing the above figures, it is important to remember that marine recreational fishing was only a small part of one of the 77 divisions included in the input-output table. Narrowing the area of reference to a county, municipality or city would increase the importance of the studied industry. A similar effect would be achieved by incorporating into the study all ports and harbours in the Koszalin subregion where fishing services were provided.

The economic importance of marine recreational fishing in Poland was much smaller than in other regions and countries such as Germany, England, France, New Zealand or South Africa, while comparable to that found in Norway. However, the importance of marine recreational fishing should be considered in terms of the length of the coastline, fishing opportunities, national traditions, and the level of economic development.

Future research on recreational fishing should focus on analysing the structure of tourist spending. It would also be necessary to narrow the area of influence of recreational fishing to smaller administrative units, preferably port cities. This would increase the impact on the local economy. The research should also be extended to other seaports on the Polish coast.

What are the prospects for the development of marine recreational fishing? The total ban on cod fishing, introduced on 01/01/2024, has practically put the angling vessels out of business. An alternative for vessel owners can be sought in cruise tourism; however, interest in this form of leisure is much lower and faces competition from passenger ships.

Therefore, fishermen grouped in the Recreational Fishing Vessel Owner Association call for the exclusion of Poland's territorial waters from the ban on angling. In addition, they propose that the administrative regulations aimed at controlling recreational fishing be relaxed, including such propositions as group rather than individual fees for a permit to be involved in angling operations and that the vessel captain's obligation to draw up catch reports and provide detailed information on each trip be withdrawn. They also demand compensation for the temporary cessation of operations, similar to that applicable to commercial fishing. The survival of marine recreational fishing in Poland depends on the fulfilment of the above demands.

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References

Akbari, N., Failler, P., Pan, H., Drakeford, B., & Forse, A. (2023). The Impact of Fisheries on the Economy: A Systematic Review on the Application of General Equilibrium and Input–Output Methods. Sustainability, 15(7), 6089. http://dx.doi.org/10.3390/su15076089

Artal-Tur, A., Navarro-Azorín, J. M., & Ramos-Parreño, J. M. (2018). Estimating the impact of cruise tourism through regional input–output tables. Anatolia, 30(2), 1-11. http://dx.doi.org/10.1080/13032917.2018.1519209

Borch, T., Moilanen, M., & Olsen, F. (2011). Marine fishing tourism in Norway: structure and economic effects. Økonomisk fiskeriforskning, 21(1), 1-17. https://okonomiskfiskeriforskning.no/wp-content/uploads/sites/2/2023/03/Borch-Moilanen-og-Olsen.pdf

Bottasso, A., Conti, M., Ferrari, C., & Alessio, T. (2014). Ports and regional development: A spatial analysis on a panel of European regions. Transportation Research Part a-Policy and Practice, 65, 44-55. https://doi.org/10.1016/j.tra.2014.04.006

BREA. (2013). The economic contribution of Cruise Tourism in Victoria 2012. Exton: Business Research & Economic Advisors.

Brocki, W., Wawrzyniak, W., & Czerniejewski, P. (2015). Morskie połowy rekreacyjne szansą rozwoju społeczno-gospodarczego strefy brzegowej Bałtyku. Europa Regionów, 23, 286-300. http://dx.doi.org/10.18276/er.2015.23-24 (in Polish).

Coto-Millán, P., Mateo-Mantecón, I., & Castro, J. V. (2010). The Economic Impact of Ports: Its Importance for the Region and Also the Hinterland. In P. Coto-Millán, M. Angel & P.J. Castanedo (Eds.), Essays on Port Economics (pp.167-200). Heidelberg: Physica. http://dx.doi.org/10.1007/978-3-7908-2425-4_13

Cukiernik, T. (2024, March 15). Rybołówstwo rekreacyjne w Polsce przestało istnieć. https://tomaszcukiernik.pl/2023/12/01/rybolowstwo-rekreacyjne-w-polsce-przestalo-istniec/ (in Polish).

Danielis, R., & Gregori, T. (2013). An input-output-based methodology to estimate the economic role of a port: The case of the port system of the Friuli Venezia Giulia Region, Italy. Maritime Economics & Logistics, 15(2), 222-255. http://dx.doi.org/10.1057/mel.2013.1

Dwyer, L., & Forsyth, P. (1998). Economic significance of cruise tourism. Annals of Tourism Research, 25(2), 393-415. https://doi.org/10.1016/S0160-7383(97)00098-4

Fernández Guerrero, J. I., Martí Selva, L., & Puertas Medina, R. (2008). Economic impact of western Mediterranean leisure ports. International Journal of Transport Economics, 35(2), 251-272. https://www.researchgate.net/publication/237297445_Economic_impact_of_Western_Mediterranean_leisure_ports

Flegg, A. T., & Tohmo, T. (2010). Regional Input-Output Tables and the FLQ Formula: A Case Study of Finland. Regional Studies, 47, 1-48. https://www.econstor.eu/bitstream/10419/119987/1/ERSA2011_0334.pdf

Flegg, A. T., & Webber, C. D. (1997). On the Appropriate Use of Location Quotients in Generating Regional Input-Output Tables: Reply. Regional Studies, 31(8), 795-805. https://doi.org/10.1080/713693401

Flegg, A. T., & Webber, C. D. (2000). Regional size, regional specialization and the FLQ Formula. Regional Studies, 34(6), 563-569. http://dx.doi.org/10.1080/00343400050085675

García-de-la-Fuente, L., García-Flórez, L., Fernández-Rueda, M. P., Alcázar-Álvarez, J., Colina-Vuelta, A., Fernández-Vázquez, E., & Ramos-Carvajal, C. (2020). Comparing the contribution of commercial and recreational marine fishing to regional economies in Europe. An Input-Output approach applied to Asturias (Northwest Spain). Marine Policy, 118, 104024. https://doi.org/10.1016/j.marpol.2020.104024

GUS. (2007). Polska Klasyfikacja Działalności (PKD 2007). https://stat.gov.pl/Klasyfikacje/doc/pkd_07/pkd_07.htm (in Polish).

Herfaut, J., Levrel, H., Thébaud, O., & Véron, G. (2013). The nationwide assessment of marine recreational fishing: a French example. Ocean & Coastal Management, 78, 121-131. http://dx.doi.org/10.1016/j.ocecoaman.2013.02.026

Hyder, K., Maravelias, Ch., Kraan, M., Radford, Z., Prellezo, R. (2020). Marine recreational fisheries – current state and future opportunities. ICES Journal of Marine Science, 77(6), 2171–2180. https://doi.org/10.1093/icesjms/fsaa147

Hyder, K., Brown, A., Armstrong, M., Bell, B., Bradley, K., Couce, E., Gibson, I., Hardman, F., Harrison, J., Haves, V., Hook, S., Kroese, J., Mellor, G., MacLeod, E., Muench, A., Radford, Z., & Townhill, B. (2020). Participation, catches and economic impact of sea anglers resident in the UK in 2016 & 2017. https://assets.publishing.service.gov.uk/media/5efc6dc7e90e075c50609dce/UK_Sea_Angling_2016-17_report_final.pdf

Kim, D. H., Seung, C., & Seo, Y. (2017). Multi-regional economic impacts of recreational fisheries: Analysis of Small Sea Ranch in Gyeong-Nam Province, Korea. Marine Policy, 84, 90-98. https://doi.org/10.1016/j.marpol.2017.07.011

Marciniak, M., & Kałuża, M. (2010). Wędkarstwo morskie jako stymulator rozwoju turystyki w regionach nadmorskich. Folia Pomeranae Universitatis Technologiae Stetinensis, Oeconomica, 284(61), 61-68. https://bibliotekanauki.pl/articles/79283.pdf (in Polish).

Merk, O., Manshanden, W., & Dröes, M. (2013). Inter-regional Spillovers of Seaports: The Case of North-West Europe. International Journal of Transport Economics, 40(3), 401-417. https://www.researchgate.net/publication/286514581_Inter-regional_spillovers_of_seaports_The_case_of_North-West_Europe

Pita, P., Hyder, K., Gomes, P., Pita, C., Rangel, M., Veiga, P., Vingada, J., & Villasante, S. (2018). Economic, social and ecological attributes of marine recreational fisheries in Galicia, Spain. Fisheries Research, 208, 58-69. https://doi.org/10.1016/j.fishres.2018.07.014

Potts, W. M., Saayman, M., Saayman, A., Mann, B. Q., Van der Merwe, P., Britz, P., & Bova, Ch. S. (2021). Understanding the economic activity generated by recreational fishing in South Africa provides insights on the role of recreational fisheries for social development. Fisheries Management and Ecology, 29(1), 29-43. https://doi.org/10.1111/fme.12515

Poudel, J. M., Henderson, J. E., & Munn, I. A. (2017). An input-output analysis of recreational fishing expenditures (2006 & 2011) across the southern United States. International Journal of Environmental Studies, 75(4), 650-672. https://doi.org/10.1080/00207233.2017.1412195

Radtke, K., & Dąbrowski, H. (2010). Połowy wodno-rekreacyjne dorszy – trzy lata później. Wiadomości Rybackie, 176(7-8). https://www.researchgate.net/publication/279436658_Polowy_sportowo-rekreacyjne_dorszy (in Polish).

Radtke, K., & Dąbrowski, H. (2016). Dynamika dorszowego rybołówstwa rekreacyjnego w wybranych portach polskiego wybrzeża w latach 1999-2014. 95-lecie Morskiego Instytutu Rybackiego: aktualne tematy badań naukowych. Zasoby ryb i rybołówstwo, 1, 59-68. https://bibliotekanauki.pl/chapters/2117572.pdf (in Polish).

Roberts, A., Munday, M., Roche, N., Brown, A., Armstrong, M., Hargreaves, J., Pilgrim-Morrison, S., Williamson, K., & Hyder, K. (2017). Assessing the contribution of recreational sea angling to the English economy. Marine Policy, 83, 146-152. https://doi.org/10.1016/j.marpol.2017.05.028

Rollins, E., & Lovell, S. (2019). Charter fishing in Hawaii: A multi-region analysis of the economic linkages and contributions within and outside Hawaii. Marine Policy, 100, 277-287. https://doi.org/10.1016/j.marpol.2018.11.032

Santos, A. M. P., Salvador, R., Quaresma Dias, J. C., & Soares, C. G. (2018). Assessment of port economic impacts on regional economy with a case study on the Port of Lisbon. Maritime Policy & Management, 45(5), 684-698. http://dx.doi.org/10.1080/03088839.2018.1471536

Scheufele, G., & Pascoe, S. (2022). Estimation and use of recreational fishing values in management decisions. Ambio, 51(5), 1275-1286. https://doi.org/10.1007/s13280-021-01634-7

Southwick, R., Holdsworth, J. C., Rea, T., Bragg, L., & Allen, T. (2018). Estimating marine recreational fishing's economic contributions in New Zealand. Fisheries Research, 208, 116-123. https://doi.org/10.1016/j.fishres.2018.06.016

Statistics Poland. (2019). Bilans przepływów międzygałęziowych w bieżących cenach bazowych w 2015 roku. https://stat.gov.pl/obszary-tematyczne/rachunki-narodowe/roczne-rachunki-narodowe/bilans-przeplywow-miedzygaleziowych-w-biezacych-cenach-bazowych-w-2015-roku,7,3.html (in Polish).

Statistics Poland. (2023a). Turystyka w 2022 roku. https://stat.gov.pl/obszary-tematyczne/kultura-turystyka-sport/turystyka/turystyka-w-2022-roku,1,20.html (in Polish).

Statistics Poland. (2023b). Ruch graniczny oraz wydatki cudzoziemców w Polsce i Polaków za granicą w 2022 roku. https://stat.gov.pl/obszary-tematyczne/ceny-handel/handel/ruch-graniczny-oraz-wydatki-cudzoziemcow-w-polsce-i-polakow-za-granica-w-2022-roku,15,9.html (in Polish).

Statistics Poland. (2023c). Zatrudnienie i wynagrodzenia w gospodarce narodowej w pierwszym kwartale 2023 roku. https://stat.gov.pl/obszary-tematyczne/rynek-pracy/pracujacy-zatrudnieni-wynagrodzenia-koszty-pracy/zatrudnienie-i-wynagrodzenia-w-gospodarce-narodowej-w-pierwszym-kwartale-2023-roku,1,50.html (in Polish).

Statistics Poland. (2024, March 15). Dane według dziedzin. https://bdl.stat.gov.pl/bdl/dane/podgrup/temat (in Polish).

Steinback, S. R. (1999). Regional Economic Impact Assessments of Recreational Fisheries: An Application of the IMPLAN Modeling System to Marine Party and Charter Boat Fishing in Maine. North American Journal of Fisheries Management, 19(3), 724-736. https://doi.org/10.1577/1548-8675(1999)019%3C0724:REIAOR%3E2.0.CO;2

Storey, D. A., & Allen, P. G. (1993). Economic impact of marine recreational fishing in Massachusetts. North American Journal of Fisheries Management, 13(4), 698-708. https://doi.org/10.1577/1548-8675(1993)013%3C0698:EIOMRF%3E2.3.CO;2

Strehlow, H. V., Korzhenevych, A., Lucas, J., Lewin, W. C., Weltersbach, M. S., Riepe, C., & Arlinghaus, R. (2023). Economic impact of resident and nonresident marine anglers to the local economy in Mecklenburg-Western Pomerania, Germany. Fisheries Management and Ecology, 29(1), 29-43. https://doi.org/10.1111/fme.12664

Trella, M., & Mickiewicz, M. (2016). Recreational fisheries pressure in the Polish waters of the Vistula Lagoon and considerations of its potential impact on the development of regional tourism. Fisheries & Aquatic Life, 24(4), 231-242. https://doi.org/10.1515/aopf-2016-0020

West, C. D., Hobbs, E., Croft, S. A., Green, J. M., Schmidt, S. Y., & Wood, R. (2019). Improving consumption based accounting for global capture fisheries. Journal of Cleaner Production, 212, 1396-1408. https://doi.org/10.1016/J.JCLEPRO.2018.11.298

Williams, C., Davies, W., Clark, R. E., Muench, A., & Hyder, K. (2020). The economic contribution of sea angling from charter boats: A case study from the south coast of England. Marine Policy, 119, 104066. https://doi.org/10.1016/j.marpol.2020.104066

Worley, T., & Akehurst, G. (2013). *Economic impact of the New Zealand cruise sector*. Auckland: Market Economics Limited.

Zhao, Q., Chen, X., Chen, G., & Qi, S. (2022). The socioeconomic contribution of the recreational fishery based on input–output analysis: The case of China. Marine Policy, 143, 105177. https://doi.org/10.1016/j.marpol.2022.105177

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ZNACZENIE REKREACYJNEGO RYBOŁÓWSTWA DLA LOKALNEJ I NARODOWEJ GOSPODARKI NA PRZYKŁADZIE PORTU MORSKIEGO W KOŁOBRZEGU

STRESZCZENIE: W niniejszym artykule określono znaczenie morskiego rybołówstwa rekreacyjnego dla gospodarki podregionu koszalińskiego oraz kraju. Badania ograniczono do portu morskiego w Kołobrzegu, który jest kluczowy dla rybołówstwa rekreacyjnego. Wyznaczony cel zrealizowano w oparciu o wyniki przeprowadzonych badań oraz za pomocą metody input-output. Wpływ gospodarczy analizowano z wyodrębnieniem efektów bezpośredniego, pośredniego oraz indukowanego za pomocą trzech wskaźników, tj. wartości globalnej, wartości dodanej oraz zatrudnienia. Wyniki badań wskazują, iż większość korzyści gospodarczych ograniczona jest do lokalnej gospodarki. Morskie rybołówstwo rekreacyjne dla podregionu koszalińskiego generuje 7,09 mln zł wartości globalnej, 3,67 mln zł wartości dodanej oraz zapewnia blisko 43 miejsca pracy. W przypadku kraju analogiczne wskaźniki przyjmują następujące wartości 10,50 mln zł, 5,03 mln zł oraz blisko 50 miejsc pracy. W scenariuszu alternatywnym uwzględniającym wyższe limity połowów dorszy jakie obowiązywały do 2019 r. rybołówstwo rekreacyjne staje się ważnych sektorem lokalnej gospodarki. Znaczenie morskiego rybołówstwa rekreacyjnego w Polsce jest dużo mniejsze, aniżeli w państwach przyjętych do porównań. Przyszłość morskiego rybołówstwa rekreacyjnego zależy od możliwości wyłączenia z zakazu połowów wędkarskich obszaru wód terytorialnych RP oraz złagodzenia przepisów regulujących działalność jednostek wędkarskich.

SŁOWA KLUCZOWE: morskie rybołówstwo rekreacyjne, turystyka wędkarska, port morski w Kołobrzegu, metoda input-output, gospodarka lokalna