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ANALYSIS OF SEASONAL FLUCTUATIONS IN ATTENDANCE OF FISHING TOURIST CENTERS

Summary. *The study presents a comprehensive analysis of factors determining the seasonal fluctuations in demand for services of fishing tourist centers. The relevance of the work is defined by the growing role of domestic tourism and the necessity of strengthening the economic sustainability of enterprises in the recreational fishing sector, which face uneven workload throughout the calendar year. The objective of the study is to conduct a comprehensive analysis of factors defining seasonal attendance fluctuations at fishing tourist centers and to identify key determinants of demand in different periods of the year. The methodological framework includes a systematic review of specialized scientific publications, statistical analysis of consumer behavior data and content analysis of applied marketing strategies. According to the results, biological cycles (spawning events, migration processes) and climatic conditions are the primary drivers of peak attendance seasons. At the same time, the growing importance of service diversification and digital marketing contributes to attracting tourists in the off-season. As a result, an integrated model for managing seasonal demand is described, based on a combination of operational, pricing and communication tools. The obtained conclusions have practical significance for managers of fishing tourist centers, tourism development specialists and regional authorities responsible for planning and developing tourist infrastructure.*

Key words: *fishing tourism, seasonality in tourism, recreational fishing, demand management, tourist center, service diversification, demand factors, tourist flow, business sustainability, marketing strategies*

Introduction. The recreational tourism industry, in particular its segment of sport and amateur fishing, represents one of the most dynamically developing sectors in the global and national economy. In recent years, under conditions of reorientation of tourist flows toward domestic markets, a stable trend of growing demand for local forms of recreation has been observed, including both professional and amateur fishing. The volume of the global fishing tackle market in 2023 was estimated at 11 970 million US dollars. Considering the growing demand in the distribution market, it is forecast that by 2030 the volume of the fishing tackle market will reach 16 430 million US dollars, with an average annual growth rate of 4.6% over the period under review [1]. At the same time, a key factor limiting the profitability and long-term stability of fishing tourist bases remains the pronounced seasonality of demand. Irregular occupancy of accommodation capacity and staff leads to downtime in the off-season and lost revenue during periods of peak demand, which creates significant economic risks for operators.

Although the problem of seasonality has received extensive coverage in tourism literature, most studies are either generalized in nature or focus on individual, predominantly climatic, determinants. There is an evident scientific gap in the conduct of a comprehensive analysis of the modern structure of seasonal demand at fishing tourist bases that would integrate natural-climatic, biological, socio-economic, and—particularly important in the era of the digital economy—marketing factors. Recent studies have begun to address these aspects; however, to date no holistic model adapted to post-pandemic market realities and accounting for modern promotional tools has been proposed.

The objective of the study is to perform a broad analysis of the factors determining seasonal fluctuations in visitation to fishing tourist bases and to identify the key determinants of demand in different periods of the year.

The author's hypothesis is that alongside traditional climatic and biological factors (water temperature, spawning migrations of fish), strategies of digital marketing and diversification of service offerings at tourist bases exert an increasingly significant influence on the modern structure of seasonal demand.

The scientific novelty consists in the description of a multifactor model that combines natural-climatic, biological, socio-economic, and marketing determinants for forecasting and smoothing seasonal peaks as well as troughs in visitation.

Materials and Methods. In the literature on analysis of seasonal fluctuations in visitation to fishing tourism centres several main thematic groups can be distinguished. The first group of sources is devoted to macroeconomic and industry trends: reports on the global fishing tackle market and general tourism development forecasts. The second group comprises studies on management and sustainable development policies in marine and coastal fishing activities. The third group focuses on spatio-temporal patterns of resource distribution and visitation as a function of seasonal factors. Finally the fourth group addresses tourist behaviour and marketing tools in the context of rural and recreational tourism.

Within the macroeconomic block analysts increasingly rely on aggregated industry reports and forecasts evaluating the volumes and growth rates of the fishing tackle market. Thus the report Global Fishing Tackle Market Growth (Status and Outlook) 2024–2030 provides details by type of tackle key regions and demand drivers but lacks breakdown by seasonality of visitation to tourist fishing centres [1]. The review Tourism Trends: The Latest Opportunities for The Tourism Industry of 2025 offers a broad overview of trends in the tourism

industry including the development of eco- and active tourism but does not delve into the specifics of seasonal dynamics in fishing tourism [4].

In the group of management and politico-ecological studies the role of state regulations and sustainable development mechanisms is emphasised. Angulo-Valdes J. et al. [2] analyse the management system of marine recreational fisheries in Cuba emphasising the balance between economic development of tourism and conservation of marine ecosystems using methods of state programme analysis and stakeholder surveys. Macusi E. D. et al. [6] examine factors affecting catches and support for closed seasons in Davao Gulf Philippines applying linear regression statistical models to field catch data and surveys of recreational anglers.

The third group concentrates on spatio-temporal patterns and the influence of climatic and meteorological factors on resource distribution and visitation. Mendes H., Silva C., Azevedo M. [5] investigate the spatio-temporal distribution of Trachurus trachurus using high-resolution spatial data and spatial autocorrelation models. Kendall M. S. et al. [7] demonstrate the impact of wind wave water temperature and calendar factors (weekdays and weekends) on forecasts of visitation to offshore fishing destinations using machine learning random forest. Huang S. et al. [10] integrate land surface temperatures into the assessment of cultural ecosystem services of urban aquatic green spaces showing seasonal changes in visitor preferences through GIS spatial analysis and evaluation of environmental variables.

Finally in studies of tourist behaviour and marketing attention is paid to motivations and promotion. Petriki O., Bobori D. C. [3] analysing limited data on domestic sport fishing in Greece apply cluster analysis and surveys to identify angler profiles and motivations but do not consider seasonality of visitation in the context of tourism services. Ivona A. [8] in a study on the sustainability of rural tourism discusses methodologies for promoting local development through community engagement and digital platforms based on qualitative content

analysis and case studies. Armutcu B. et al. [9] investigate the role of digital marketing and social media in tourist behaviour using statistical analysis of social network data and surveys but without focus on fishing tourism and seasonal aspects.

Despite the significant range of topics and methodologies the literature reveals contradictions. On one hand industry reports provide valuable global trends but do not account for local seasonal visitation fluctuations. On the other hand spatio-temporal model studies are often based on narrow examples (specific species or closed seasons) without generalisation for tourist centres. Underexplored issues include integration of economic demand models with ecological and social data at the level of tourist complexes as well as the influence of digital promotion channels on the seasonality of visitation to specific fishing tourism centres. Moreover there is little attention to long-term changes in climatic conditions and their consequences for demand for fishing tourism services.

Results and Discussion. The study enabled the ordering of the set of factors determining seasonal fluctuations in attendance at fishing tourist bases and the identification of the fundamental patterns of their manifestation. In the traditional demand model in this field two key groups of determinants are distinguished: natural-climatic and biological. Natural-climatic determinants include the temperature regime of air and water, the duration and nature of ice cover, changes in water-body levels and general meteorological conditions. Biological determinants are conditioned by the characteristics of the life cycles of exploited species — their spawning migrations, phases of intensive feeding after spawning (feeding frenzy), concentration in wintering holes etc. The interaction of these determinants forms a typical seasonal attendance curve with pronounced peaks and troughs [3; 4].

On the basis of a synthesis of data from open sources and industry reports an averaged occupancy curve was generated for a fishing base located in the mid-latitude temperate-continental climate zone (table 1).

Table 1

Data for constructing a graph of the typical annual load of a fishing tourist base [3; 8; 9]

Month	Load	Key factors
January	Minimal	midwinter low temperatures
February	Minimal	activation of predator biting last ice
March	Average	under-ice fishing anticipation of open water
April	Average	opening of the open-water season pre-spawning migration
May	Minimal	spawning ban
June	High	post-spawning feeding frenzy start of the summer season
July	High	stable summer biting holiday season
August	High	peak of the summer season active biting
September	High	velvet season autumn predator feeding spree
October	High	autumn fishing pre-ice formation
November	Minimal	ice formation off-season
December	Average	opening of the ice-fishing season New Year holidays

Nevertheless the proposed model relying solely on natural-climatic determinants is clearly of a simplified nature. Empirical data and modern studies demonstrate that diverse socioeconomic and marketing influences join the forming seasonal curve, capable of both intensifying the amplitude of peaks and mitigating the depth of troughs. Among such influencing variables it is necessary to highlight temporal windows of national holidays and school vacations, the general level of disposable income of the population, the convenience of transport connections, as well as targeted promotional campaigns by the tourist base itself.

With the aim of quantitative and qualitative analysis of the effect of the specified managed factors a conceptual scheme has been proposed that treats the structure of market demand as a hierarchized multi-level system (see Figure 1).

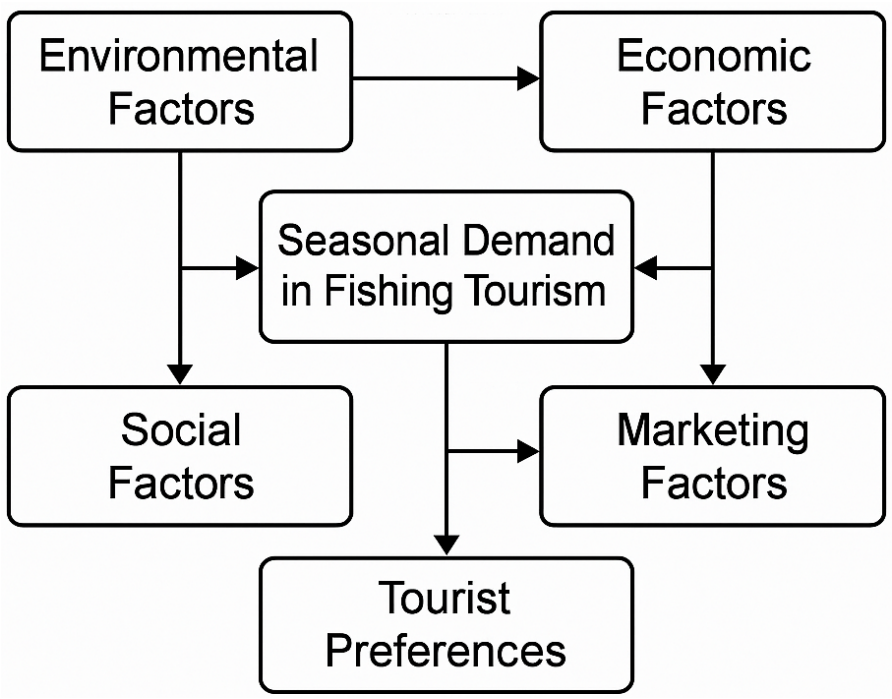

Fig.1. Integrated model of seasonal demand factors in fishing tourism [2; 5; 7; 10]

The proposed conceptual model initially assumes that the administration of the tourist base is unable to transform cardinal natural-climatic and biological parameters, but possesses resources for targeted management of second-level factors (object and service infrastructure) and third-level factors (marketing strategies, pricing mechanisms) in order to adjust the final volume of demand. The tool for leveling seasonal fluctuations is diversification. Instead of focusing exclusively on the fishing offer, advanced tourist bases form additional types of activity

• In the winter period (December–March) in addition to the organization of ice fishing a complex of winter entertainments unfolds including snowmobile riding, ski routes, spa procedures in baths and saunas, as well as special holiday tours for New Year and Christmas;

• In the off-season (November, early April) the main emphasis is placed on corporate events, teambuilding and professional seminars, supplemented by thematic packages for photo hunting and bird migration watching;

• In the spawning ban period (May) non-fishing formats of recreation develop including family programs, gastronomic festivals, water expeditions by kayak and themed eco-trails.

The improvement of digital marketing practices plays a key role in optimizing seasonal demand fluctuations [9]. Studies show that the most effective tourist bases implement highly targeted advertising campaigns directed at narrow segments (tour for under-ice zander fishing; phototour: spring awakening of nature), actively generate expert content — maintain author blogs and create video materials on off-season fishing opportunities — and also employ adaptive pricing mechanisms by introducing discounts and special promotions to stimulate bookings during downturn periods.

Further in Table 2 an analysis of seasonal fluctuations in the attendance of fishing tourist bases will be conducted.

Table 2

Analysis of Seasonal Fluctuations in Attendance of Fishing Tourist Centers [6; 7; 9]

Season	Advantages	Disadvantages	Future Trends
Spring	• Increased water levels – optimal spawning conditions and enhanced fish activity • Comfortable air temperatures (10–20 °C) • Opportunity for an early season start	• Unstable weather (frosts/rain) • Increased activity of ticks and mosquitoes • Limited infrastructure (many facilities still ramping up)	• Active adoption of eco-tourism and "green" programs • Growth of online booking with flexible cancellation policies • Use of digital guide apps with weather and fishing forecasts
Summer	• Peak tourist flow and maximum revenues• Wide range of additional services (pedal boats, water skiing) • Optimal conditions for family vacations	• Overcrowding of campsites and waterbodies – competition for fishing spots • Higher prices for accommodation and gear rental • Accelerated infrastructure wear and ecological stress	• Implementation of dynamic pricing (day/night rates) • Development of "smart" guest-distribution systems (chat hubs, density sensors)• Expansion of VR/AR tours and online training courses
Autumn	• Picturesque scenery and "golden" foliage – photo tours and	• Reduced fish activity and biting as water cools•	• Emergence of thematic festivals (fishing, gastronomic)

	combined leisure packages • Moderate guest flow – peaceful atmosphere • Often lower prices compared to summer	Frequent rainy spells and winds • Fewer work shifts – possible staff shortages	• Introduction of seasonal discounts and "two-for-one" packages • Collaborations with local producers (delicacies, souvenirs)
Winter	• Minimal competition – exclusive ice-fishing trips • Low operational load on camps in the off-season • Attraction of extreme-fishing enthusiasts (cold, ice)	• Weak demand and unstable guest flow • Additional expenses for heating accommodation and equipment • Limited access (frozen roads)	• Growth of ice-fishing with snowmobile and drysuit rentals • Creation of year-round complexes with greenhouses and aquariums • Hybrid tours combining fishing with spa/wellness programs)

Thus seasonality ceases to be an insurmountable constraint and becomes a manageable resource. It represents a multifaceted challenge, the resolution of which requires the application of a suite of strategic tools: diversification of offerings, digital marketing, and flexible pricing. The shift from passive following of natural cycles to active creation of year-round demand through the development of a varied and attractive tourism product is the key to achieving sustainable profitability.

Conclusion. In the course of the study an assessment of the phenomenon of seasonal fluctuations in attendance at fishing tourism bases was carried out, which made it possible to confirm the proposed hypothesis. The obtained data demonstrated that although natural-climatic and biological determinants set the fundamental trajectory of demand, their influence can be adjusted through the implementation of modern managerial and marketing practices.

Seasonal variations in fishing tourism are driven by a complex interaction of natural and socio-economic factors. Approaches that consider only natural-climatic determinants do not provide sufficient accuracy for strategic planning and forecasting in a dynamically changing tourism market.

The key mechanism for smoothing seasonal downturns and enhancing the financial sustainability of tourism bases is the expansion and integration of

offerings: in addition to fishing programmes, ecological routes, corporate events, and winter activities are included. Such a comprehensive tourism product generates additional demand during traditional off-season periods.

Modern digital tools — targeted advertising, content marketing and flexible pricing models — prove decisive for promoting niche and off-season offerings. Their application allows for attracting relevant target audiences during periods of low occupancy and increasing the fill rate of the bases.

The described systematization of determinants divides them into uncontrollable (natural and biological) and controllable (marketing and managerial), which creates a clear matrix of points of effort application and simplifies managerial decision-making.

A promising direction for further research is the quantitative assessment of the contribution of each factor to the overall occupancy of tourist bases based on econometric modelling of regional data.

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