

Article

Delivering Tourism Sustainability and Competitiveness in Seaside and Marine Resorts with GIS

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Abstract: In 2015, the United Nations General Assembly identified 17 Sustainable Development Goals (SDGs) to be achieved by the year 2030. The study's main objective is to identify the necessary conditions and potential for ensuring both the sustainability and competitiveness of tourism in seaside and marine resorts located in or at coastal and marine protected areas on the example of Karklė (Lithuania). Based on the results of a benchmarking study of five South Baltic resorts using the Delphi technique, the survey team identified the main deficiencies of Karklė as a seaside and marine resort of an international scale. We address the deficiencies by applying a geographical information system as a decision-support tool for the Littoral Regional Park where Karklė is located. We conclude that for ensuring both the sustainability and competitiveness of tourism in seaside and marine resorts, it is expedient to combine the Delphi-based tourism benchmarking with integrated coastal management and maritime spatial planning, for which GIS is an indispensable tool.

Keywords: Baltic Sea; Delphi technique; GIS; seaside and marine resorts; Sustainable Development Goals



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1. Introduction

In 2015, the United Nations (UN) General Assembly identified 169 targets to measure progress towards global sustainability under 17 Sustainable Development Goals (SDGs) to be achieved by the year 2030. It included, among the SDGs, Goal 14: Life Below Water (the “Oceans’ goal”), aiming to harvest the oceans, seas and marine resources sustainably and preserve marine ecosystems for future generations. These goals have resulted from international interdisciplinary collaboration and explicitly enabled countries to determine their context-appropriate strategies. However, achieving sustainable development faces many social and ecological challenges, e.g., resource scarcity, single sector resource management and environmental pollution [1]. These challenges are complex and complicated and, therefore, to address them requires dedicated and concerted international efforts.

The target 14.5 of Goal 14 anticipates conserving at least 10% of coastal and marine areas based on the best available scientific knowledge and consistent with international and national law. This target had to be achieved by 2020, i.e., last year already. It has one indicator 14.5.1, which is the size of coastal and marine protected areas (CMPAs) to the total size of maritime space. All the riparian countries of the Baltic Sea have achieved this target in their territorial waters [2]. However, considering the coverage of marine protected areas (MPAs) in the open Baltic Sea, the situation is far less satisfactory.

The South Baltic offshore areas need further protection, including the Baltic Sea offshore area of Lithuania. The peculiarity of the Lithuanian system of protected areas is that even the protected areas of IUCN Category I (i.e., national parks) include settlements, especially small-scale resorts. Such peculiarity is also pertinent to the Curonian Spit, which is the only coastal and marine national park in Lithuania. A similar situation is

in the neighbouring Russian Federation, whose enclave of Kaliningrad Oblast covers the southern part of the Curonian Spit also designated as a national park. It includes three coastal settlements, albeit, differently from Lithuania, excludes the maritime zone.

Russian nature sanctuaries fall either to IUCN Category IV (Habitat/species management areas), or to Category V (Protected Landscapes and Seascapes), whereas Lithuanian regional parks fall solely into Category V. These are the sites where permanent or temporary limitations are imposed on some economic activities, such as hunting, grazing, logging etc. The difference in conservation regime and management measures between these two categories might be pivotal since Category IV areas are subject to more restricted management giving priority to nature conservation, whereas Category V areas enjoy flexible management regimes allowing multiple uses of their resources [3].

In other South Baltic countries, besides Lithuania and Russian Federation, the core zone of coastal and marine national parks as IUCN Category I protected areas are void of any settlements. In Poland, there are no settlements in Slowinski and Wolinski national parks whilst two CMPAs of IUCN Category V—Vistula Spit Landscape Park and Littoral (Nadmorski) Landscape Park permit sustainable development of tourism. Hiddensee, a tiny seaside resort in the federal state of Mecklenburg-Western Pomerania of Germany, is in the buffer (“care and development”) zone of Western Pomerania Lagoon Area National Park where limited tourism is permitted.

Modern seaside and marine resorts located at CMPAs function as the playground for diverse tourist “tribes” and cater for varied interests [4–6]. However, the conservation regimes impose strict rules regulating tourism just in one aspect: conservation. The challenge is how to preserve healthy coastal and marine environment for the future simultaneously providing seaside visitors with “places to play and places in play” [7]? Therefore, the study’s overall objective is to identify the necessary conditions and potential for ensuring both the sustainability and competitiveness of tourism in seaside and marine resorts located in or at CMPAs on the example of Karklė (Lithuania).

For this aim, Geographic Information Systems (GIS) are indispensable as decision-support tools applied to facilitate the integrated management of spatial resources. Specific uses of GIS in maritime spatial planning (MSP) programs and projects include:

- development planning;
- conflict mapping;
- environmental impact assessment;
- hazard and risk mitigation;
- facilitating public participation.

Seven notions for the GIS application in marine and coastal decision-making are:

- (1) No consideration for MSP can include all data to analyze all alternatives;
- (2) Psychophysical limits to capability of individual and collective decision-making and too much information obscure the search for an optimal alternative;
- (3) Eliciting and prioritizing the critical issues and challenges is subjective;
- (4) Decisions are inevitably limited due to:
 - Complexities of coastal and marine ecosystems;
 - Difficulties of coastal and maritime decision-making;
 - The multiple-use nature of coastal and maritime areas.
- (5) The framework used to present outputs will affect:
 - The amount of information that can be presented;
 - The extent to which the information can be perceived.
- (6) Selection bias that randomization of data is hard to achieve is omnipresent;
- (7) Without appropriate understanding of GIS data management processes and GIS output, decisions assisted by GIS can be flawed or inappropriate.

2. Materials and Methods

2.1. Definition of Coastal, Marine, Maritime and Nautical Tourism

According to the definition given by the European Commission (EC), coastal tourism covers beach-based tourism and recreation activities, e.g., swimming and sunbathing and other activities for which the proximity of the sea is an amenity, such as wildlife watching and coastal walking or jogging. Maritime tourism covers predominantly water-based activities, e.g., nautical sports and sailing (usually carried out in coastal waters) and cruising, where tourists roam marine regions in a short holiday [8]. However, an overview of sea-related tourism research notes that the definition of maritime, marine and nautical tourism is evolving as the activities that arise and are incorporated into these sectors are constantly changing [9].

Even the boundaries between coastal and maritime tourism are fuzzy. For instance, wildlife watching may take place on the beach, but also from the boat and such water-based activities like snorkelling or scuba diving may take place close to the coast, or in shallow reef areas in the open sea. The main difference is in what are the main assets for tourism development—is it a seacoast and nearshore (for coastal tourism), or is it an open water space regardless its depth (for maritime tourism). Nautical tourism is a sub-sector of coastal and maritime tourism where the primary focus is on navigation-based leisure activities on sea—primarily on leisure sailing and marine recreational fishing, but excluding high-seas cruise shipping.

2.2. Coastal and Marine Resort Benchmarking

The European Commission [8] argues that coastal and maritime tourism is the most considerable maritime activity in Europe and employs app. 3.5 million people. The total recreational benefits of the Baltic Sea are 15 billion EUR annually [10]. Therefore, the authors of the cited recent study propose the term “blue tourism” as a conceptual solution comprising maritime, nautical and marine tourism [9], p. 16: “Blue tourism means holiday activities or events that involve traveling for pleasure combined with boating and maritime activities in a sea environment in a sustainable way.” The EC has developed a Coastal and Maritime Tourism strategy (CMT strategy) to support the Blue Growth initiative [11].

A few benchmarking schemes offer objective assessment of environmental quality and sustainability of seaside and marine resorts and other “blue destinations” aimed to encourage coastal and maritime tourism industry for the adoption of national and international legislation, like the Blue Flag for beaches and marinas. This award is the most widely known and prestigious prize for beaches and marinas in Europe [12]. It was introduced in 1987 by the Foundation for Environmental Education in Europe (FEEE). Qualification has 26 specific criteria covering aspects of environmental education and information, water quality, environmental management, safety and services.

Many South Baltic seaside municipalities—most in Denmark and least in Sweden—regard the Blue Flag award as a token praising the efforts in delivering coastal and marine sustainability [13]. However, it has limitations concerning the intangible aspects of “blue tourism”. For many tourists, the award status is an important basis for beach or marina selection, but findings indicate their ignorance of the award requirements [12]. For instance, urban beaches, that are not the most appealing ones in scenic value, enjoy the Blue Flag award more often than pristine but remote ones [14].

The QualityCoast seaside sustainability benchmarking system is a comprehensive certification program for assessing sustainability of seaside destinations based on 118 criteria. The key advantages of QualityCoast compared to other seaside tourism and hospitality benchmarking and certification schemes are the following: (1) It is the only scheme focused on seaside tourism sustainability, apart from the Blue Flag award; (2) It is more comprehensive than the Blue Flag including also all the criteria for the Blue Flag, among many other ones; (3) It is the largest international certification program for seaside destinations worldwide.

Neither Blue Blag nor QualityCoast as ‘blue tourism’ benchmarking approaches combine sustainability and competitiveness into a comprehensive benchmarking system tailored explicitly for seaside and marine resorts. In our case studies, the benchmarking workout relies on a series of morphological and infrastructural parameters that reflect both resort sustainability and competitiveness. We apply criteria that represent a mix of qualitative and quantitative criteria, thus delivering a quali-quantitative approach that proved to be productive in comparative coastal studies [6]. In that way, a benchmarking study provides a useful tool to accomplish a fair comparison of different target areas to assess the qualification of Karklė as a sustainable and competitive seaside and marine resort of an international scale.

2.3. Study Areas

For benchmarking analysis, we have selected the following Baltic seaside resorts located in the same climatic zone and in the vicinity of IUCN Category I or Category V CMPAs (Figure 1): Palanga (Lithuania), Świnoujście (Poland), Zingst (Germany) and Liepāja (Latvia). These “blue destinations” are the South Baltic seaside and marine resorts that are best suited for the comparison with Karklė and could serve as good practice examples for sustainability and competitiveness goals. According to the recreational typology of the South Baltic seacoast proposed by Baltranaitė et al. [13], the seaside and marine resorts of Germany (Zingst) and Poland (Świnoujście) belong to Subregion II—Southern Baltic Coasts and Islands. Meanwhile the seaside resorts in Lithuania (Karklė and Palanga) and Latvia (Liepāja) belong to Subregion III—Southeast Baltic Graded Coasts.



Figure 1. Map of the South Baltic Area with the target seaside and marine resorts (Plotted by Ramūnas Povilanskas).

Karklė is an ethnographic seaside resort in the Littoral Regional Park, a peri-urban Baltic Sea CMPA sandwiched between Klaipėda, a large seaport city and Palanga, a large seaside resort. One of the essential tasks of the Littoral Regional Park management is to optimize the use of recreational and educational tourism infrastructure that would allow visitors to enjoy the park’s natural and cultural heritage values combined with coastal and maritime tourism. Karklė is designated as ethnocultural managed reserve comprising preserved period homesteads of fishing farmers, a children’s summer camp, marine beaches, many B&Bs, several camping sites and a visitor center.

Palanga is the busiest Eastern Baltic seaside resort. It is also one of the largest spa towns in Lithuania. Holidaymakers there break away from their everyday environment and enjoy natural sources of health: sunlight, seawater and clean and fresh seaside and pine forest air. Local climatic conditions of Palanga are favorable for patients with allergies, respiratory diseases and hypertension. Palanga stretches for 24 km on the Baltic seacoast. Since 2004, a 1 km-long beach at Birutė Park has received the Blue Flag Award.

Liepāja is a city in western Latvia by the Baltic Sea, the third-largest city of the country and a seaport. Liepāja was known as a seaside resort since the 19th Century. It became an Imperial resort since 1860 when the Tzar of the Russian Empire began to visit Liepāja with his entourage. The central seaside beach in Liepāja is between 50 and 80 m wide and 8 km long, composed of fine white sand. Since 1999, the central beach of Liepāja has regularly received the Blue Flag Award. It was the first seaside beach in Latvia to provide the necessary infrastructure for people with visual and mobility impairments.

Świnoujście is a Polish seaport city on the Baltic Sea bordering Germany. The city is located on 44 islands, three of which are inhabited: Uznam, Wolin and Karsibór. It is easily accessible from Scandinavia (ferries to Denmark and Sweden), Germany and the Polish mainland (by road). The city is one of the most visited tourist destinations in Poland and a popular seaside resort. Świnoujście beaches are some of the widest in the Baltic Sea Region: their width is ca. 200 m and length ca. 10 km. Since 2005, the beach on the island of Uznam is annually awarded the Blue Flag Award.

Zingst is the eastern part of the three-part Fischland-Darß-Zingst peninsula in Mecklenburg-Western Pomerania, Germany, between the cities of Rostock and Stralsund on the southern Baltic seacoast. This area is part of the Pomeranian coast. The Zingst Peninsula forms an east-facing spit which is nearly 20 km long and only 2–4 km wide. The beach surface of Zingst is covered with white sand making it attractive for tourists. The locality received the status of a health resort in 1979 and since 1992, the beach of Zingst has regularly received the Blue Flag Award.

2.4. Data Sources

A total of 18 parameters reflecting the conditions at the seaside and marine resorts include the essential features of amenities and facilities affecting the recreational competitiveness of the destinations. Different time periods and sources for quarrying various datasets are provided in Table 1. The data have not been homogenized and left in a heterogeneous form since the Delphi technique, for which the data was applied, is a qualitative methodology and does not require homogenization across the datasets, differently from quantitative approaches. It requires data homogenization across the geographical destinations which was taken care of in the most consistent way. For the same reason (use of the data for Delphi judgment), the compiled datasets were used as simple structures and not integrated into a specially designed and organized geodatabase.

The survey team retrieved the relevant climate parameters covering the period between 2010 to 2018 and including the monthly mean air temperature (°C), the monthly amount of rainfall (mm) and the duration of sunshine (hours) from respective national sources: the Lithuanian Hydrometeorological Service for Karklė and Palanga, the German Meteorological Service for Zingst, the Institute of Meteorology and Water Management—National Research Institute for Świnoujście and the Latvian Centre for Environment, Geology and Hydrometeorology for Liepāja. We have not retrieved climate parameters of wind regime due to their difficulty for comparison, yet we are aware of their importance for seaside destinations' recreational attractiveness.

Table 1. Time periods and sources for quarrying datasets for the Delphi-based benchmarking judgment.

Dataset	Quarrying Period	Source
Mean air temperature	2010 to 2018	State monitoring agency
Mean nearshore water temperature	2015 to 2019	Aqua/MODIS
Rainfall	2010 to 2018	State monitoring agency
Number of sunshine hours	2010 to 2018	State monitoring agency
Chlorophyll A concentration in water	2015 to 2019	Aqua/MODIS
Width of beaches	2015 to 2019	Google Earth™
Sloping of nearshore	2015 to 2019	Google Earth™
Lithology of beach sediments	2015 to 2018	Specialized documents
Number of parking lots	2015 to 2019	Google Earth™
Distance from parking lots to the beach	2015 to 2019	Google Earth™
Density of parking lots	2015 to 2019	Google Earth™
Number of parked cars	2015 to 2019	Google Earth™
Car parking fee	2015 to 2019	Specialized Internet page
Camping fee for motorized visitors	2015 to 2019	Specialized Internet page
Availability of the Blue Flag award	2015 to 2019	Specialized Internet page
Seasonal distribution of visitors	2015 to 2018	Specialized documents
Foredune trampling	2015 to 2019	Google Earth™
Overall sustainability	2015 to 2018	Specialized documents

We quarried the nearshore water temperature (°C) and chlorophyll A concentration in water (mg/m³) from satellite imagery for the summer months of 2015 to 2019, available at the NASA website <https://neo.sci.gsfc.nasa.gov> (accessed on 13 August 2019), according to the measurement points of the geographical coordinates of the study area. The data acquisition sites were the following ones: Karklė—village beach nearshore (3 km long), Palanga—leisure beach nearshore (24 km long), Liepāja—central beach nearshore (8 km long), Świnoujście—leisure beach nearshore (10 km long) and Zingst—leisure beach nearshore (18 km long).

The eliciting of values for the chlorophyll concentrations in the nearshore was based on quarrying the raster data from the satellite imagery in a 1-pixel longshore belt closest to the coastline at the beaches of each of the five surveyed South Baltic seaside resorts. Then, an average for each resort from quarried values in all surveyed years was calculated. This approach in more detail is described by Hu et al., 2012 [15]. The resolution of 1000 m × 1000 m of the satellite images was sufficient to make an integrated judgment since the Delphi technique, for which the data were collected, is a qualitative, not quantitative one.

The following parameters were obtained from the Google Earth™ engine which is ever widely used as a spatial data quarrying tool for remote sensing of both environment and society yielding sufficient accuracy for quantitative analysis [16]: (i) width of beaches; (ii) sloping of nearshore; (iii) number of parking lots; (iv) distance from parking lots to the beach; (v) foredune trampling; (vi) number of parked cars. We retrieved the data from the South Baltic Area's Google Earth™ remote sensing images between June 2015 and August 2019 (see example in Figure 2). The ground-truthing of the data by the team members took place in mid-August 2019. The parking lots' density was derived as the parking lots' size to the total size of recreational space in the resort area.

We have taken the car parking and camping fees for motorized visitors from the tourist information sites on the Internet. Information on the lithology of beach sediments, the Blue Flag award and the patterns of seasonal distribution of visitors was available from various documentation sources. The analysis of the target areas' comprehensive plans and development strategies used a “nuts-and-bolts” approach [13,17] that aims at finding not only the required information but any other relevant knowledge on the subject that may be helpful in the next steps, i.e., for the Delphi judgment.



Figure 2. A Google Earth™ image of Zingst (Germany) taken on 7 June 2018.

The nearshore sloping was evaluated as a three-step procedure. First, we measured the distance perpendicularly from the coastline to the 20 m depth point in the Google Earth™ South Baltic nearshore images. The measurements were done at each 200 m along the entire length of leisure beaches in each of the five surveyed South Baltic seaside resorts. At the next step, an average distance from the coastline to the 20 m depth was calculated. This information enabled the experts participating in the Delphi judgment to assign relative scores for the nearshore sloping as an indicator of physical amenities and relative safety of bathing.

2.5. Delphi Technique

The scores for assessing the competitiveness and sustainability levels of five investigated resorts were elicited using the Delphi technique. It used a series of iterative rounds. A controlled feedback for attaining consensus judgment in a group of experts who do not interact directly with each other followed these rounds. For this survey, the experts performed three judgment rounds using an approach drawn from previous Delphi studies in landscape management and tourism [18–26]. We have applied the Delphi technique from June to October 2020 using the e-mail communication to recount ten renowned Baltic experts in coastal conservation and tourism.

In the scoping round, the organizer introduced the experts to the suggested benchmarking approach and 18 criteria of competitiveness and sustainability at the South Baltic coastal and marine resorts. The study organizer asked the experts to evaluate from one to five each of the 18 criteria of competitiveness and sustainability at each of the five South Baltic coastal and marine resorts using the information and data collected by the research team and to justify their choice. The organizer of the survey further collected, summarized and sent back the judgements to the panelists for evaluation. The judgements included the responses from other panelists. Therefore, each expert could read the opinions of others and adjust their own opinions accordingly.

In the next two rounds, the study organizer sent the revised judgments back to the experts. The Delphi study in three iterative convergence rounds aimed to achieve a higher quality of expert response on issues than a single-round questionnaire [18]. The feedback on the results from the previous rounds led the panelists to converge their opinions on the incipient scores and pursue a consensus. The respondents reached a partial consensus of approximately 80% of the opinions after the third round.

2.6. Application of GIS

In this study, the aim of GIS application was to consider the deficiencies elicited in the benchmarking study for Karklė as a seaside and marine resort and identify the zones of potential conservation and tourism conflicts in the Littoral Regional Park where Karklė is located. For this aim, various spatial information sources were used—from the national GIS database to available maps and written sources, to own data collected during the field surveys [27,28]. The research team produced several resource and activity digital layers for

Karklė Marine Reserve and the adjacent coastal area of the Littoral Regional Park using GIS software ArcGIS® by ESRI™:

- (1) Distribution of fish and benthic communities;
- (2) Significant colonies of breeding and wintering birds;
- (3) Endangered, rare or protected species distribution and significant sites;
- (4) Fisheries' sites (artisanal, commercial and recreational);
- (5) Tourist facilities;
- (6) Borders of functional zones of the Littoral Regional Park;
- (7) Bathing water quality in the nearshore;
- (8) Beaches and other areas designated for outdoor leisure and tourism;
- (9) Adjacent coastal and inland land use.

Next, the survey group performed overlay analyses to identify a suitable set of sites with tourism amenities and nature values (CMPAs, coastal landscapes and recreational sites). Each set of data was stored as an individual layer. We have overlaid the layers to reveal where are the overlapping areas. The areas of particular interest were the places of overlapping conflicting priorities. However, it is essential to note that they may not be the same as where actual management conflicts occur. This information needs further interpretation to be useful.

Therefore, we used appropriate aspects of the GIS software to derive images showing different aspects of tourism-related conflicts. Recent developments in GIS have opened an opportunity to identify spatial clusters of tourism sites and services and determine tourism hotspots based on qualitative–quantitative information from diverse sources [28,29]. The GIS data layers generated from the fieldwork, remote sensing data and overlaying the layers became the basis for adjustment of the land use, conservation and tourism management plans in the Littoral Regional Park through planning processes.

3. Results

3.1. Environmental Features of the Seaside and Marine Resorts

In all the studied South Baltic seaside and marine resorts, the seasonal distribution of holidaymakers during the peak season was similar. The number of holidaymakers increased from Midsummer (June 24). Most of them came in the second half of summer (July 15 to August 15) when air temperature ranged from 24 to 29 °C and nearshore water temperature ranged from 17 to 22 °C. Later, the number of holidaymakers at the seaside starts to decline. Average air temperatures from 2010 to 2018 show that July and August had the most favorable conditions in all studied resorts including Karklė (Figure 3a). The duration of sunshine was also similar in all these seaside resorts (Figure 3b).

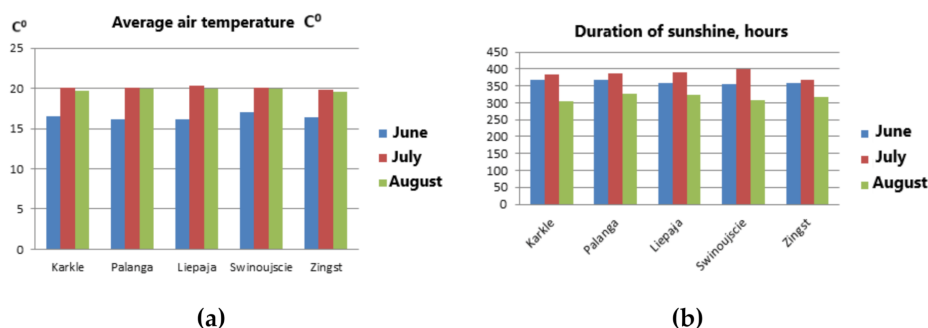


Figure 3. Climate parameters at South Baltic seaside and marine resorts in the summer months from 2010 to 2018 (our compilation): (a) Average monthly air temperature (°C); (b) Duration of sunshine (hours).

However, the seaside resort of Świnoujście stood out with the most prolonged sunshine hours in July, during the peak tourist season. The lowest duration of sunshine in the

peak season was in Karklė (in August). If the air temperature and the duration of sunshine were somewhat similar in all the studied seaside resorts, then the rainfall was distributed quite unequally (Figure 4a). The highest level of rainfall occurred in August, especially in Karklė and Palanga. July was the rainiest month in Świnoujście. Liepāja has the most continental climate and lowest rainfall in all three summer months: 60 mm in June, 100 mm in July and 111 mm in August. Elsewhere, the monthly rainfall ranged from 130 mm in Świnoujście to 170 mm in Karklė.

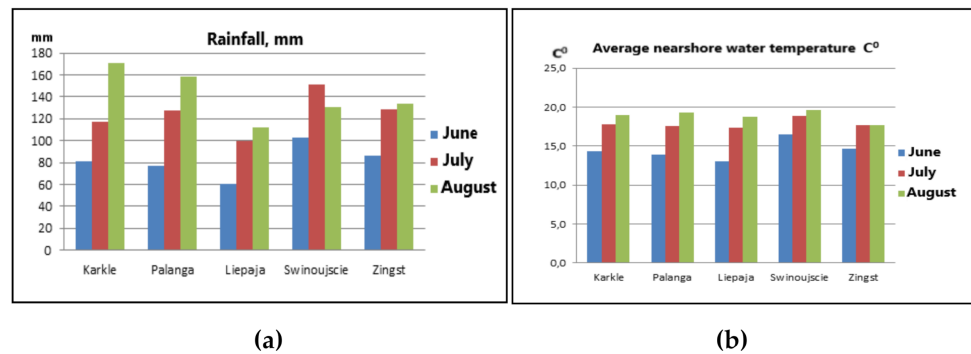


Figure 4. Climate parameters at South Baltic seaside and marine resorts in the summer months from 2010 to 2018 (our compilation): (a) Average monthly rainfall (mm); (b) Average nearshore water temperature (°C).

All studied South Baltic seaside resorts have almost identical nearshore water temperature conditions for bathing and other water recreational activities in the summer season (Figure 4b). However, in Świnoujście the water warms up fastest. Already in June, the nearshore water temperature reaches 16 °C there, while it is 13 to 14 °C in the other studied South Baltic seaside resorts. It rises during the next months in all the resorts remaining the highest in Świnoujście: in July it reaches 19 °C and in August warms up to pleasing 20 °C. The nearshore water temperature at other studied seaside resorts does not differ much: it reaches 18 °C in July and 19 °C in August.

The graph (Figure 5) shows that the average chlorophyll A concentration by months is highest in August and lowest in June. Warm air and water create the most favorable conditions for algal “bloom”, particularly in August. Of the compared main seaside resorts, Palanga and Liepāja have the lowest water quality in the summer months: the concentration of chlorophyll A in the nearshore water can reach up to 25 mg/m³ there. However, the worst situation is in the nearshore of Karklė: here, the concentration of chlorophyll A in water often exceeds 25 mg/m³.

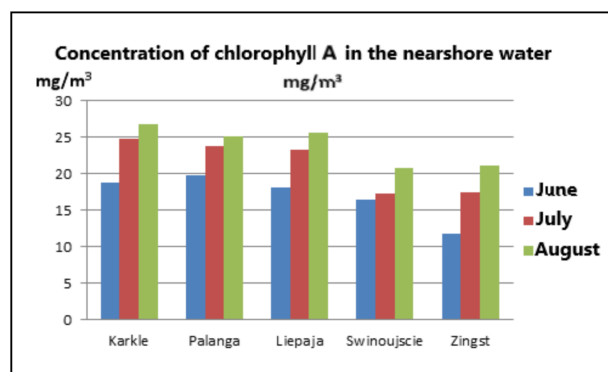


Figure 5. Average chlorophyll A concentration in the nearshore water in the summer months of 2015 to 2019 (our estimate).

The detrimental situation with algal “blooms” at Karklė may be due to the proximity of the Curonian Lagoon [30]. Most of the nutrients entering the Curonian Lagoon from the Nemunas River basin flow through the Klaipėda Strait to the Baltic Sea and head north along the eastern Baltic seacoast resulting from the anti-clockwise circulation of the Baltic Sea water [31]. In this way, the nutrients pollute the nearshore, reduce the water quality and degrade the recreational appeal of Karklė and, to a lesser extent, Palanga and Liepāja as well. The same anti-clockwise circulation spares the Baltic Sea nearshore of Świnoujście from the impact of the Odra River discharge plume [32].

3.2. Competitiveness and Sustainability Benchmarking

Based on the results of the Delphi judgement, Table 2 shows the average scores of the quality of recreational amenities for summer months for all the surveyed seaside resorts. Świnoujście, with its rapidly warming nearshore water, stands out from the big picture. It also has a maximum duration of sunshine. Therefore, this resort is most competitive regarding the most critical indicators for vacationers—air and water temperature and sunshine. Zingst has the best nearshore water quality as it has the lowest chlorophyll A concentration. Świnoujście remains second regarding this quality parameter. Climate and water quality features are the same in neighboring Palanga, Liepāja and Karklė.

Table 2. Average scores of the quality of recreational amenities in the studied South Baltic seaside resorts (scores from 1—poor to 5—excellent).

Recreational Amenities	Liepāja	Palanga	Karklė	Świnoujście	Zingst
Average air temperature	2.7	2.7	2.7	3.0	3.0
Duration of sunshine	2.7	2.7	2.7	3.0	2.7
Average rainfall	2.7	2.0	2.0	1.7	2.3
Nearshore water temperature	2.0	2.3	2.3	4.0	2.7
Chlorophyll A concentration	2.0	2.0	2.0	2.7	3.3
AVERAGE SCORE:	2.4	2.3	2.3	2.9	2.8

According to the scores awarded for the quality of recreational amenities, the studied South Baltic seaside resorts are ranked as follows: 1—Świnoujście (2.87 points), 2—Zingst (2.80), 3—Liepāja (2.40), 4–5—Palanga and Karklė (2.33). The assessment results of suitability of beach morphology for recreation are given in Table 3. Beaches 60 m and wider received 5 points. Beaches from 45 to 60 m wide received 4 points, 30 to 45 m wide –3 points, 15 to 30 m –2 points and narrower than 15 m received just 1 point.

Table 3. Average scores of physical beach quality in the studied South Baltic seaside resorts (scores from 1—poor to 5—excellent).

Beach Morphology	Liepāja	Palanga	Karklė	Świnoujście	Zingst
Beach width	5	4	1	5	3
Beach area	5	2	3	5	3
Nearshore sloping	5	4	3	5	4
Beach and bottom lithology	5	4	3	5	4
AVERAGE SCORE:	5.0	3.5	2.5	5.0	3.5

The most suitable beaches for recreation are the southern beach of Świnoujście and the southeastern beach of Liepāja. It is due to their large width (to accommodate more people with greater comfort). The slope of the nearshore is not steep making it safer and more comfortable for bathing. The fine-grained sand that forms the beaches provides particularly appropriate conditions for sunbathing. Liepāja has the largest area for recreation on the seaside considering both the width and length of its beaches. The beaches in Zingst and Palanga are narrower than in Liepāja and Świnoujście. However, the beach conditions are also quite comfortable there as well.

Karklė has inferior conditions for seaside and marine recreation than the rest of the study areas. Not only is there the least recreational space, due to a narrow beach, but the beach and nearshore bottom lithology is also the worst. Coarse sand and gravel with many boulders prevail there. The average width of Karklė beach is twice smaller than that of the beach of Liepāja. Yet, Karklė, along with Zingst, has the largest number of parking lots located closer than 1.5 km away from the beach, i.e., at the maximum distance, a visitor walks to the beach comfortably (Table 4).

Table 4. Main aspects of the beach accessibility infrastructure in the studied South Baltic seaside resorts (scores from 1—poor to 5—excellent).

Car Parking Infrastructure	Liepāja	Palanga	Karklė	Świnoujście	Zingst
Number of parking lots	2	3	5	2	5
Distance to the beach	2	2	3	5	5
Density of parking lots	2	4	3	3	5
Number of parked cars	2	2	2	2	5
Car parking fee	2	5	1	4	5
Camping fee for motorized visitors	2	2	1	2	5
AVERAGE SCORE:	2.0	3.0	2.5	3.0	5.0

Świnoujście and Liepāja have the least number of parking lots specifically allocated for holidaymakers. These are primarily seaport cities, so they have historically planned infrastructure for seaport and urban services. Due to the lack of seaside parking lots, holidaymakers and locals park their cars at the streets closest to the beach. During the peak season in Palanga, cars are completely forbidden from the center, but, nevertheless, are parked at more remote streets and alleys. Zingst visitors enjoy the largest area of parking spaces surpassing the other studied resorts by at least four times.

Considering the distance from the parking lots to the beach, the closest parking lots to the beach are in Karklė and Zingst; the farthest parking lots to the beach are in Palanga and Liepāja. There is not a single parking lot in Palanga closer than 500 m from the beach. Therefore, car parking in the streets closest to the beach is popular both in Palanga and Liepāja. Only Zingst enjoys optimal public parking as half of the lots are no further than 100 m from the beach. It also has the largest number of parking spaces per km².

Holidaymakers arrive at the seaside not only by cars but also by campers, caravans and mobile homes. The largest number of campsites fit for any users, which are not further than 1500 m from the beach, is in Karklė, the smallest number is in Palanga and Liepāja. However, the largest area of parking spaces for the vehicles is in Zingst. The highest parking fees are in Świnoujście and Palanga; the lowest ones are in Karklė and Liepāja. Meanwhile, the highest price for accommodation with a camper is in Zingst—the average price per day is 31 euros, the lowest price is in Świnoujście (12 euros per day). This is one of the pivotal parameters of the resort competitiveness.

Summing up, the highest score for the attractiveness of the seaside resort for motorized vacationers was awarded to Zingst. In general, Karklė has the most unfavorable conditions for coastal recreation from all the studied South Baltic seaside resorts in terms of recreational infrastructure. Finally, three criteria describe the overall sustainability and competitiveness of the seaside resorts (Table 5): number of the beaches that regularly receive the Blue Flag award, shoreline quality parameters and a comprehensive sustainability index: integrated coastal management (ICM) framework, CMPA and health resort status, ICM and MSP processes in place.

Table 5. Sustainability of the South Baltic seaside resorts (scores from 1—poor to 5—excellent).

Sustainability	Liepāja	Palanga	Karklė	Świnoujście	Zingst
Blue Flag award	2	1	0	2	5
Foredune trampling	2	5	2	4	5
Overall sustainability	2	3	4	3	5
AVERAGE SCORE:	2	3	2	3	5

3.3. GIS Mapping of “Blue Tourism” Conflicts

As mentioned, to tackle the deficiencies elicited in the benchmarking study for Karklė as a seaside and marine resort, the survey team produced several GIS layers of resources and activities for Karklė Marine Reserve as an adjacent coastal area of the Littoral Regional Park where Karklė resort is located. We produced the GIS map of functional zoning of the Littoral Regional Park using GIS software ArcGIS® by ESRI™ based on quali–quantitative information taken from various sources (Figure 6). However, the main effort was to identify and analyze potential conflicts between tourism as well as coastal and marine nature conservation in the Littoral Regional Park.

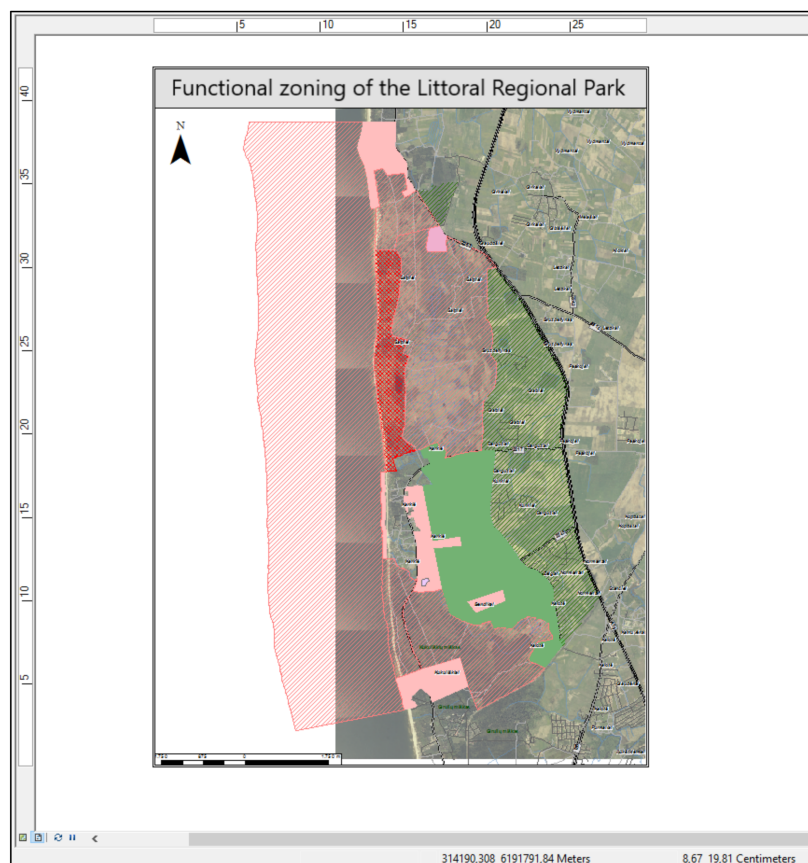


Figure 6. A GIS map of functional zoning of the Littoral Regional Park (plotted by Egidijus Jurkus).

Therefore, we used appropriate aspects of the GIS software to derive images showing overlapping areas (indicative of conflict) in Figure 7. The beaches and other sites for the “blue tourism” development were the areas of particular interest. The interpretation of elicited information and the GIS data layers generated from the overlaying helped to adjust the land use, conservation and tourism management plans in the Littoral Regional Park through interpreting the dynamic interaction between maritime tourism and marine nature conservation from several perspectives. In this way, the GIS-based analysis led to the integrated management decisions.



Figure 7. A GIS map of tourism-related conflicts the Littoral Regional Park (plotted by Egidijus Jurkus).

4. Discussion

Mass seaside tourism generates huge pressures on the coastal and marine environment and ecosystems, such as higher water use and increased waste generation, transport emissions, especially in the peak seasons [33]. We may anticipate that after the COVID-19 pandemic, seaside and maritime tourism will return, however, hopefully, greener. With the view on the prospects of the more sustainable tourism future, the single profile cannot define coastal and maritime tourist destinations located in or at CMPAs [34]. This challenge is pivotal when considering many diverse aspects of sustainability, the Blue Growth, ICM and MSP [35].

Natural recreational resources, such as climate or landscape diversity, are not the only factors determining the attractiveness of coastal and maritime areas for tourism development [36]. The leisure potential of the coast and nearshore depends on many other factors, e.g., social and economic conditions, infrastructure development and accessibility by transport [37]. In the case of Karklė resort, the Littoral Regional Park Management Plan (adopted in 2016) is the primary document defining the recreational management of the beaches, nearshore and hinterland. The plan has allotted 14 car parking lots in the territory of this CMPA. However, parking a car on weekends is still a problem.

Regarding coastal tourism and recreation, the amenities available at Karklė are meagre. Noticeable disparities in recreational development characterize this seaside resort compared to other resorts of the southern Baltic coast. However, the development of nature-based wellbeing tourism may change the situation. The Littoral Regional Park Management Plan sets out the principles of CMPA management and landscape zoning,

guidance for recreation and development of residential areas and the CMPA buffer zone regulations. The plan prioritizes hiking and biking tourism by creating infrastructure along the most important international cycling routes Eurovelo10, Eurovelo13, European cycling route R1, Baltic Amber Trail, as well as the network of national cycling routes.

A structural model named the “semiotic square” can express the challenging situation of Karklė as a seaside and marine resort in a CMPA and describe a variety of issues that depend on oppositional relationships [38]. In the case of Karklė, we characterize a wide array of issues pertinent to the sustainability and competitiveness as a set of oppositional relationships: external drivers vs. internal properties and coastal management vs. marine planning (Figure 8). Such approach renders it meaningful to elicit and discuss four types of issues or eventual sources of management conflicts: external coastal drivers, internal coastal properties, external maritime drivers and internal marine properties within and outside the Littoral Regional Park (Table 6).

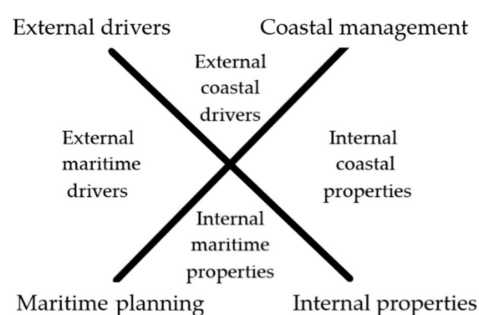


Figure 8. A “semiotic square” of oppositional relationships determining the situation of Karklė as a seaside and marine resort in a CMPA (plotted by Ramūnas Povilanskas).

Table 6. Main oppositional relationships determining the situation of Karklė as a seaside and marine resort in a CMPA.

	Coastal Management	Maritime Planning
External drivers	Coastal erosion Unruly crowds of day-visitors Access restrictions for cars Narrow beach/steep nearshore	Boating restrictions Pollution plume Commercial fisheries
Internal properties	Coarse beach sediments Appealing coastal vistas	Marine reserve status Rich biodiversity Pristine marine area

On the other hand, although this dichotomous model is enticing because of its simplicity, it is quite tedious because it represents a prototype, much emptier than the reality it refers to. Two critical values related to coastal nature and tourism become pivotal as “fundament ones” in describing the relationships between the seaside resort and the CMPA: (1) the value of nature in and for itself and (2) the value of nature for the human experience [39]. Such a dichotomy implies in one instance to make a drastic structural interference into the recreational zones, in yet another, to impose full restrictions for the use of and access to protected zones [3].

Therefore, a new approach towards the sustainability and competitiveness of Karklė as a resort in a CMPA is necessary for turning the local community’s view on the protected area status from an obstacle to an asset for tourism development. The concept of “wellbeing tourism” may offer new opportunities for increasing the sustainability and competitiveness of Karklė as a small-scale resort [40]. This concept implies shifting the positioning from passive seaside tourism to health-related tourism and active outdoors. Referring to nature-based wellbeing tourism in Sweden, Hansen notes [40], p. 125: “Central to nature-based tourism is the experience of nature as wild, pristine and untouched. In other words, the experienced nature itself has to be ‘healthy’, that is, in good environmental condition.”

However, to achieve the seaside and maritime tourism sustainability in Karklė, the planners of the Littoral Regional Park must ensure consistency in planning terrestrial and maritime space, including for the management of the specific area of transition between land and sea represented by the coast. In that respect, ICM is of utmost relevance forming the “link” between maritime and terrestrial planning. Although the European Commission in its Directive 2014/89/EU refers exclusively to the MSP, it contains an explicit reference to ICM, calling on the Member States to promote coherence between these two processes. In this framework, the application of GIS in ensuring coherence between the two processes becomes indispensable.

Combining Delphi-based benchmarking and GIS application is a novel approach to SDG-centered ICM and MSP. The main advantage is that the Delphi-based benchmarking has proved to be a very effective approach to elicit the deficiencies of a destination, in our case, a seaside and marine resort located in or at a CMPA, whilst GIS is a verified tool to address these deficiencies and conflicts between tourism and conservation in a comprehensive way. The combination of both tools delivers an integrated methodology to support decision-taking and planning process. The main deficiency is, as mentioned, that the elicited conflict-prone areas may not be the same as where actual conflicts occur. Hence, there is a need for further ground-truthing.

Referring back to the sea-related SDG 14, the case study of Karklė opens potential pathways for balancing the target 14.5 of conserving at least 10% of coastal and marine areas with the need for strengthening seaside resort competitiveness. In that sense, the proposed methodology of combining the Delphi-based blue tourism benchmarking with GIS-based development and conservation conflict mapping may be particularly pertinent to Small Island Developing States and least developed countries where increasing economic benefits from the sustainable use of oceans and seas is highlighted by the UN as SDG target 14.7 along with other relevant targets: reducing marine pollution (SDG 14.1); restoring marine habitat (SDG 14.2); eliminate overfishing, as well as illegal, unreported and unregulated fishing (SDG 14.4); eliminate harmful fishing subsidies (SDG 14.6).

5. Conclusions

We conclude that for ensuring both the sustainability and competitiveness of tourism in seaside and marine resorts, it is expedient to integrate the Delphi-based tourism benchmarking with ICM and MSP, for which GIS is an indispensable tool. Identifying the zones and types of conflicts to be considered forms the basis for future decision-making in the framework of MSP and ICM. In this way, the produced tourism conflict map provides a valid instrument for protecting an area threatened by the urban sprawl in the peri-urban Littoral Regional Park. In the next phase, when any relevant information is processed via the GIS, the planners should apply geostatistical analysis to integrate and validate their interpretations with further quantitative elaborations.

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