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The analyses of determinants affecting the river cruising in Poland in comparison with European tendencies

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Abstract

River cruising is well developed in Europe, particularly in the western, central, and some southern regions, and river tourism has expanded visibly during the current decade. A number of highly attractive tourist destinations are located upon rivers, the prime rivers used for cruises being the Danube, Rhine, Maine, Elbe, Loire, and Seine. The topic of this paper is an analysis of European river cruising and the determinants affecting this tourist product. In particular, the paper analyses the current state of river cruising in Poland, as well as the threats and opportunities that act as drivers for such cruising activity. This paper aims to identify and rank the main problems facing river cruising in Poland compared with prime destinations in Europe. River cruising has great potential, but it requires the removal of barriers and the addition of primary infrastructure.

Introduction

Cruising can be defined as travelling on passenger ships on seas, rivers, and lakes for pleasure, recreation, and exploration of the itineraries available there. Cruise voyages comprise international cruises, as well as cabotage or coastal shipping. Cruise vessels are equipped with accommodations and on-board facilities for passenger leisure activities and entertainment. Cruising has become one of the prime segments of contemporary tourism, and, according to the Cruise Line International Association, the number of cruise passengers in 2018 reached 28.5 million worldwide (CLIA, 2018).

River cruises constitute a segment of the cruise industry, but, in relation to ocean cruising, have specific characteristics. Ships dedicated to river cruising are considerable smaller than ocean-going vessels, due to the limited parameters, or measures, of rivers. Passenger cabins and public spaces, as well as on-board services, are not as extensive as on ocean cruisers; nonetheless, river cruising is a luxury product. The aim of river cruises and the target groups of this tourism product also differ from ocean-going ones – the prime goal for visitors is exploration of attractive places along the rivers (cities, towns, national parks, castles, etc.).

The prime market of this sector are European waterways, and, beyond Europe, river cruises have been developed in the Far East (the Mekong and Yangtze Rivers), Africa (the Nile River), Russia (e.g., Volga River).

River cruises comprise the tourist products, including the ships with their passenger facilities offering several day trips and do not involve river trips on pleasure craft lacking hotel accommodations sailing along rivers for short, daily excursions.

Literature review and methodology

The cruise industry has been investigated in a great number of research studies, most of which concern sea cruises. The majority of papers have focused either on factors attracting cruise passengers from the perspective of ports of calls (e.g., Castillo-Manzano, Fageda & Gonzalez-Laxe, 2014; Pallis et al., 2018) or on geographical destinations and sub-markets (e.g., Vaggelas & Pallis, 2010; Dragović, Škurić

& Kofjač, 2014; Wang, Pallis & Notteboom, 2015; Esteve-Perez & Garcia-Sanchez, 2017). The economic impact of the sea cruise industry on regions and their economies is another sector. According to Brida and Scuderi, passenger expenditures are a key variable in the economic analysis of benefits related to cruise tourism (Brida & Scuderi, 2013). Moreover, sea cruising is recognized as a significant factor determining the development of visited destinations. (e.g., Stefanidaki & Lekakou, 2014). The selected issues discussed in research related to ocean cruises are common to river cruising as well.

However, considerably fewer studies are related to cruises on European inland waters. Erdeji and Dragin point out that the majority of researchers focus on cruises along the Danube waterway in Southern Europe (Erdeji & Dragin, 2017). The river cruises in Serbia, Croatia, and Romania are most often studied (e.g., Dragin, Jovicic & Lukić, 2010; Ožbolt, Herak & Herak, 2016; Skrzeszewska, Lukovic & Marusic, 2016; Brodarič, Schiozzi & Smojver, 2017). However, a relatively small amount of research has focused on Central and West Europe (e.g., Stefan, Burcea & Cretu, 2015). Moreover, the researchers analyse river cruises as a tourism product (e.g., Rusic, Bosnic & Kelic, 2016), the motivations for cruise holidays (e.g., Hung & Petrick, 2011), and the river cruise labour structure (e.g., Dragin et al., 2014).

There are no studies discussing the Polish cruise river market. Papers and reports have analysed inland water cargo transport, waterways infrastructure, or short trips for pleasure. In a few papers considering inland transport in Poland, the river cruises are only mentioned, (e.g., Galor, 2017). The prime objective of this paper is to investigate barriers influencing the development of cruising on Polish waterways. The research question is as follows: What are the prime threats to development of river cruising in Poland? It is assumed that waterways' technical parameters, or measures, are crucial for development of river cruising in Poland.

The scope of this paper concerns the analyses of river cruises on European main waterways, the requirements for river cruises, and a discussion of the potential for developing cruises on Polish waterways. For the purposes of this study, analyses of the river cruise market and inland infrastructure were conducted based on data sources – reports, statistics, and documents related to the subject. Benchmark analyses for the comparison of selected parameters was also used. The initial stage of research comprises investigation of river cruises in Europe and is based on available sources of information, including reports and analyses of the river cruise market. Due to the fact that river cruising is regarded as a specific segment of tourism, requirements for the industry are selected and ranked as benchmarks. The next stage of the study comprises an analysis of river cruising in Poland. Referring to the assumption that the infrastructure regarded as waterside is the prime factor of cruise development, a detailed investigation of Polish waterways and ports was conducted. The other examined benchmarks were landside (waste reception) and destinations. Finally, applicability of drivers was also prioritized.

River cruises in Europe

River cruises in Europe constitute the prime world market of cruising on inland waterways. It is estimated that half of the market is concentrated West – North on Rhine, Danube, Elbe, Main and Moselle with the Rhine – Main – Danube Canal. The other sub-markets are French waters – the Soane, Seine, Loire and Rhone as well as South – East with part of the Danube, Sava, and Drava.

It is estimated that about 1.45 million passengers travelled on European rivers in 2017 (ShippaxMarket 18, 2018). The greatest demand was created by European citizens, primarily from Germany, France, Great Britain, Ireland, Austria, and Switzerland. During the last decade, a growing number of tourists

Table 1. Prime river cruise operators in Europe in 2019 (author's elaboration based on operators websites)

Operator	No. of ships	Pax Cruise	Trading
Viking River Cruises	59	98–190	Danube, Elbe, Rhine, French R.,Douro, Moselle
A-Rosa Flussschiff	10	172–242	Rhine, Moselle, Danube
CroisiEurope	33	60–174	Rhine, Danube, Elbe, French, Rivers Douro
Phoenix Reisen	11	87–216	Danube, Elbe, Rhine
Ama Waterways	19	144–196	Rhine, Danube, Elbe, French, Rivers Douro
Cristal River Cruises	5	105–152	Danube, Rhine, Main, Moselle
Avalon Waterways	14	128–166	Danube, Rhine, Main, Moselle, French Rivers
Emerald Waterways	5	121–180	Danube, Main, Rhine, Douro, Rhone,

from outside Europe has been noted, particularly from the United States and Canada, and the latter amounted to 38% of the 2017 demand (Annual Report, 2018). River cruises are characterised as being most popular among tourists from age groups of 55 and older.

In the 2017, the river cruise fleet in Europe comprised 346 active vessels with 50,616 beds (Annual Report, 2018). During the last 15 years, the number of active cruise vessels has doubled. In 2017, 13 new buildings entered into service, while in 2018, 7 ships were delivered (ShippaxMarket 18, 2018).

The European market is concentrated, and Table 1 gives the leading players. Viking River Cruises dominates with 59 vessels, and second is CroisiEurope with 33 ships deployed on European rivers. The others are Alma Waterways and Avalon Waterways. According to the European River Cruise Association, up to 17 operators are involved in the industry.

Requirements for river cruise shipping

The river cruise industry, as a specific segment of tourism, requires some key elements. A model structure of the river cruise value chain comprises three elements related to the water or land sides as well as tourist attractiveness of itineraries (see Figure 1).

Tourist attractiveness of the destination is primarily determined by cultural and social factors. Along the main waterways are situated historical cities and places, e.g., the cruises on the Danube river include visits to the following cities: Ulm, Passau, Salzburg, Linz, Vienna, Bratislava, and Budapest. Cruise destinations have little influence on characteristics of the area, however, as cities can upgrade these features based on tourist information, range of tourist products and services offered on the mainland,

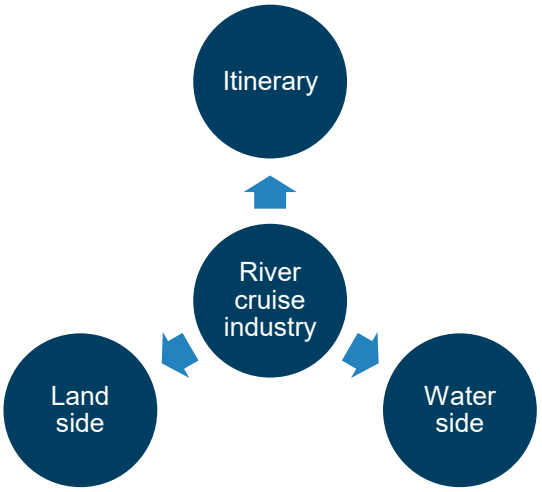

Figure 1. Relation between the key elements of river cruise industry

availability of thematic tours dedicated to specific interests of tourists, special seasonal attractions, local gastronomy, presentations of culture, etc.

The second key element waterside comprises infrastructure – waterways and ports. A typical river cruise vessel has dimensions of about 130 metres in length, 17 metres beam, and draft around 1.6 metres, and such particulars demand appropriately navigable waters. The majority of prime waterways where river cruises are well developed are classified as Va – VIb categories, according to The European Agreement on Main Inland Waterways of International Importance – AGN Agreement (see Table 2). The navigability of rivers and canals is suitable for the size of the current river cruise ship. Further, prime rivers are connected with canals, e.g., Wesel – Datteln Canal, Rhine – Herne Canal, Main – Danube – Rhine Canal, Seine – Moselle Link, and Saone – Moselle Link, providing cohesion to a navigable waterways network.

Table 2. Parameters of prime European waterways (author's elaboration based on (AGN, 1996; UNECE, 2019))

River	Length km	Country	Vessels length (m)	Vessels length (m)	Draft lower limit (m)	Height under bridges (m)	Class
Elbe	695	Germany	110	11.45	1.4–2.7		Va – VIb
	235	Czech Republic	85–110	11.50	0.9–2.10	4.7–6.5	IV – Va
Danube	211	Germany	110–120	11.40	2.7	4.61–6.0	Vb – VIb
	279	Austria	140	15.0	3.0	7.42–10	VIb – VIc
	274	Hungary	195–225	38	1.9–2.0	8.47–8.87	VIb – VIc
Moselle	151	France	170	11.40	3	6.17	Vb
	242	Germany	110	11.45	2.8	6.17	Vb
Rhine	796	Germany	135	22.8	2.1–3.0	7.0–9.10	VIa – VIc
Main	384	Germany	110	11.45	2.3–2.7	6.0	Va – Vb
Seine	487	France	180	11.40	2.2–3.5	5.15–5.95	Vb – VII
Saone	219	France	110–185	11.40	3.5	4.4–4.8	Va – Vb

The infrastructure in the destinations concerns available berths for the cruise ships. From the waterside, the pier details – length and depth – are most important for safe accommodation. The largest river cruisers require a quay of 140 metres with depth of pier a minimum of 2 metres.

The landside comprises two segments, the first being the location of the pier and the latter including port facilities and services for the ship.

The former is important from the cruise passengers' points of view. The quay should be located close to the city centre within a short walking distance, and the wharfs should be accessible to public transport and taxis as well. The piers in Budapest, Vienna, Paris, and Linz are examples of location near the city centres. However, it should be noted that destinations with a large number of calls particularly often face the lack of accessible berths in the vicinity of city centres, and the cruise ships are moored on the banks at longer distances. Prime destinations experience congestion, and access to berths often constitutes a bottleneck.

The landside services for ships comprise two segments – the cruise ship supply and waste reception. The demand for food and catering goods is specific due to the number of passengers. The supply is based on local enterprises or branch suppliers. Similarly, bunker and fresh water deliveries are provided by local companies, with the places and sources of supply chosen by the ships' operators based on policy.

The latter landside segment refers to waste reception services. Waste comprises sewage (black and grey water), bilge and sludge, garbage, etc. In maritime transport and in sea ports, the disposal of ships' waste is regulated by several regulations, the prime being the Marpol Convention (The International Convention for the Prevention of Pollution from Ships), with 1, 4, and 5 annexes related to prevention of pollution by oil, sewage, and garbage, respectively, meaning that ocean cruise ships and port authorities, as well as river cruisers in sea ports must comply with the binding requirements. Lastly, the regulations applying to waste management are unified.

Waste reception in inland shipping varies in strictness of regulations and policies in different countries, and no international convention makes uniform the rules for waste reception on European waterways. However, some regulations do exist. In 1996, the Strasbourg Convention on the collection, deposit, and reception of waste generated during navigation on the Rhine and other inland waterways (CDNI) was signed by six countries and applies to navigation on their inland waterways. The signatory states are Germany, Belgium, France, Luxembourg, the Netherlands, and Switzerland. This came into force on 1st November 2009 and is applicable over the entire length of the river Rhine and on all inland waterways in Germany, the Netherlands, Belgium, and on the international part of the river Moselle in Luxembourg and France (CDNI, 2018). According to the convention, the countries are obliged to install on the waterways a sufficiently dense network of reception stations for collection of ships' waste.

The other regulation is a draft International Danube Ship Waste Convention (IDSWC), and the rules are elaborated in the frame of the EU-funded project CO-WANDA. The project finished in 2014 and was an initiative work for a binding treaty, which shall provide clear guidelines for ship waste management along the Danube (Berger, Horvat & Simongáti, 2014). However, the convention has not yet been launched.

Handling of waste and sewage differs in regions due to regulations and available facilities. Sewage collection is based either on suction vehicles for the disposal the ship waste or fixed facilities in berths on shore. New vessels are mostly equipped with sewage treatment facilities. Bilge and sludge disposal is conducted using mobile facilities, suction vehicles, or reception barges. Garbage comprises solid waste (paper, plastic, metal, glass) as well as food waste. The requirements for waste disposal and separation vary with the city, but, in most destinations, separation of solid waste is obligatory due to environmental protection regulations, and cruise lines must comply with local regulations.

Usually the disposal is provided by local external companies, whose services are organized by the berth's operators (cruise terminal) or ships' agents.

River cruises in Poland

River cruises are not well developed in Poland, and the only waterway where cruise ships navigate is the Oder River. However, during the last decade, the number of trips from Western Europe to the Oder has been growing. The ships navigate from Berlin via the Oder–Havel Canal, passing the locks at Niederfinow (Niederfinow Boat Lift) and at Hohensaaten, the connection to the Oder (Galor, 2017).

Szczecin is the prime destination to which cruise ships operate regularly. Since 2008, the city has hosted from 90 to 120 ships yearly (see Figure 2). Szczecin is a port of call for cruisers sailing from German cities such as Berlin or Potsdam to the

Baltic Island and Stralsund, and its itineraries are Peenemunde, Greifswald, Wolgast, Heringsdorf, and Vitte. The cruises are offered by several ship and tour operators, e.g., Nicko Cruises, CroiseEurope Cruises, Plantours Kreuzfahrten, Phoenix Reisen, and Saga River Cruises.

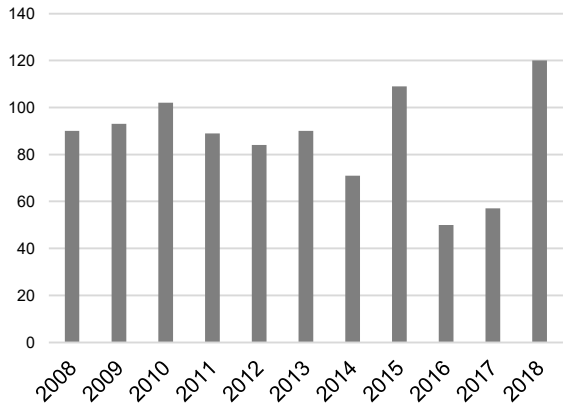

Figure 2. Number of river cruise vessels in Szczecin (author's elaboration based on Port of Szczecin Authorities)

Occasionally, after oversail Hohensaaten, the river cruise ships navigate southbound. However, the number of trips made towards Wrocław and places along this part of the Oder is significantly lower (up to 5–6 calls a year) than the cruises to Szczecin. Apart from Wroclaw, the itineraries are Frankfurt/Oder, Zielona Góra (Cigacice port), Głogow, Malczyce, and Scinawa.

At the beginning of the last decade, German Deilmann Cruises attempted to establish regular river cruises on the Vistula River from Gdańsk to Warsaw, and vice-versa. Although the ship *Frederic Chopin* made a couple of trips during the 2004 season on the Vistula, only two times did the ship reach Warsaw due to low water levels. In the 2006/2007 seasons, two ships, the *Polonaise* and the *Johannes Brahms*, sailed from Gdańsk to Kaliningrad. Both cruisers navigated from Gdańsk via the rivers Wisła, Martwa, Przekop Wisły and Szkarpawa to the Vistula Lagoon. Currently the cruise river ships do no navigate on any of the remaining Polish waterways except the Oder.

Opportunities and threats of river cruises in Poland

The first and the most important benchmark is water infrastructure. Poland presents a relatively significant inland network with respect to length, covering nearly 11% of the total inland network of the European Union. Those countries with longer waterways are Finland (8018 km), Germany (6636 km), France (5872 km), and the Netherlands (5046 km).

The inland waterway network in Poland totals 3653.5 km and is composed of regulated navigable rivers and canalized sections of rivers with lengths of nearly 3060 kilometres, canals with total lengths of 345 kilometres, and navigable lakes 258.6 kilometres in length (see Table 3).

The waterways of international importance – those in classes IV and V – constitute approximately 6% of the total waterways' lengths. A few sections of two prime Polish rivers – the Oder and Vistula – possess the measurements required to be classified in these classes. Class III waterways account for 10.8% of the Polish network, with the rest comprising classes I and II and amounting to 83.2% of the total waterway lengths. Table 4 presents the required measures, or parameters, for each class.

As presented in part 4, most European cruise trips are developed in waterways classified as IV to VIb, according to AGN agreement. In Poland, the waterway networks considered for cruising are extremely limited, and Table 5 below displays the parameters of selected waterways in relation to cruise trips.

Oder northbound from the junction with Oder–Havel Canal is categorized as III–Vb. The former section is relatively short, and its characteristics are sufficient for small cruise ships. The southbound Oder is categorized as class III from Gliwice to Brzeg Dolny and class II to the Warta estuary. The latter section presents the most difficult navigation conditions and hinders accessibility to Wroclaw.

The Vistula River Waterway has very different parameters. The longest sections of the river have parameters of class Ib (Przewóz–Plock, 527.8 km,

Table 3. Inland waterways in Poland (the author's own elaboration based on (Statistical Office in Szczecin, 2017))

Specification	Total	Waterways of regional significance				Waterways of international significance		
		Ia	Ib	II	III	IV	Va	Vb
	3653.5	1079.9	892.9	1070	396.6	37.5	55	121.6
Navigable regulated rivers	2416.6	757.8	755.6	691.4	115.1	–	–	96.7
Canalised parts of rivers	643.6	100.8	137.3	105.8	207.2	37.5	55	–
Canals	334.7	167.7	–	104.8	46.8	–	–	15.4
Navigable lakes	258.6	53.6	–	168	27.5	–	–	9.5

Table 4. Selected technical parameters for inland waterway classes (author's elaboration based on (Journal of Laws, 2002))

Technical parameters	Ia	Ib	II	III	IV	Va	Vb
River waterways / canals							
Min. width	15/12	20/18	30/25	40/35	40/40	50/45	50/45
Min. depth	1.2/1.5	1.6/2.0	1.8/2.2	1.8.2.5	2.8/3.5	2.8/3.5	2.8.3.5
Locks							
Min. width	3.3	5.0	9.6	9.6	12.0	12.0	12.0
Min. length	25	42	65	72	120	120	187
Min. depth	1.5	2.0	2.2	2.5	3.5	4.0	4.0
Ships parameters							
Max. length	24	41	57	67–70	80–85	95–110	
Max. width	3.5	4.7	7.5–9.0	8.2–9.0	9.5	11.4	
Max. draught	1.0	1.4	1.6	1.6–2.0	2.5	2.5–2.8	

Włoclawek–Tążyny estuary, 43 km) and class II (Tążyny estuary–Tczew, 190 km). These parts of the river are, in practice, inaccessible for river cruisers. Only a short section of the upper Vistula, Wloclawek Lake, and part of the lower Vistula from Tczew to the mouth are navigable in relation to its parameters (see Table 5).

Brda, Notec, and Warta rivers are sections of International Waterway E-70, and its parameters meet the standards of classes Ib and II. Major limitations of the route are transit depths on parts of Notec river as well as the locks` dimensions on the Bydgoski Canal, most of which are 57.4 long and 9.6 m wide and so too short for river cruisers.

Based on the analysis of the infrastructure data, it can be stated that Polish waterway parameters are insufficient for considerable development of the inland cruise business, with the transit depths and dimensions of locks constituting the prime barriers. The employment of paddle vessels is a solution for shallow waters, and three such newly built vessels are already deployed on western waterways. The next objective is the incoherence of waterways. Vistula i.e. fulfils conditions for classes IV and V in three sections, which are separated by parts of belonging to classes I and II. International waterway E-70 via Bydgoski Canal does not provide accessibility for Oder and Vistula transit trips, however, and other rivers are classified as Ia and Ib and so cannot be considered for cruise purposes.

In relation to port requirements, Szczecin is well prepared for hoisting river cruisers. The ships are moored in berths located in the elegant pier located in the city centre, and the length and depth of the city's wharf is adequate for the largest cruisers entering the Oder River. Moreover, two to three vessels can be accommodated simultaneously. The port's infrastructure is comparable to those of western

Table 5. Technical parameters of selected waterways (own elaboration based on (Journal of Laws, 2002))

River	Section	Length (km)	Class
Oder	Gliwice – Kędzierzyn Koźle – Brzeg Dolny	228.3	III
	Brzeg Dolny – Warta estuary	335	II
	Warta estuary – Ognica	79.4	III
	Ognica – Dąbie Lake	7.1	Vb
	Western Oder	36.3	Vb
Vistula	Przemsza estuary – Canal Łuczyński	37.5	IV
	Przewóz – Płock	527.8	Ib
	Płock – Włocławek	55	Va
	Włocławek – Tczew	233.5	Ib/II
	Tczew – inland sea waters	32.7	III
	Martwa Wisła	11.5	Vb
Brda – Noteć	Brda – Bydgoski Canal	38.9	II
	Bydgoski Canal – Notec estuary	187.2	Ib/II
Warta	Ślesiński Canal – Notec estuary	338.4	Ia/Ib
	Noteć estuary – Kostrzyn	68.2	II

destinations on the Rhine or Danube rivers. On the other hand, in Wroclaw, cruise vessels are berthed in Marina Osobowice I (this berth is 130 metres long), the former winter berthage for barges, which is located about 8 kilometres from the city centre, an inconvenience for passengers, and transport to the city is organised by ships' agents. Along the Oder, cruise ships are also hoisted, i.e., in Cigacice Port for passengers visiting Zielona Góra and Głogów Port or Marina depending on the size of the vessel. However, in general, the conditions of berths located at Polish destinations are inadequate for the dimensions of the ships and, due to their locations, are often at a longer distance to city centres or other attractive destinations.

In inland shipping, the Regulation of the Council of Ministers mandated the regulations governing the collection, storage, and disposal of waste and sewage from ships engaged in inland shipping beginning the 21st of May 2003. According to these regulations, waste reception points should be located at transhipment quays, ports, harbours, or other places where ships are moored, and waste from ships being collected is added to the account of the ship`s operator, which should comply with these regulations in respect to management and documentation of sewage, bilge water, and garbage.

As a sea port, Szczecin meets all river-cruising requirements in relation to waste reception and supply services. Sewage and bilge waters are collected using suction vehicles, while the garbage must be selected. For southbound ships, the Cigacice port is the place at which sewage and bilge water are received, whereas solid waste is collected on the pier in Wroclaw. However, apart from Szczecin, reception facilities are insufficient for bigger ships and growing traffic.

The last element of the river cruise concept, attractiveness to tourists, constitutes the opportunity for cruise river development in Poland. Along the Oder and Vistula are situated historical cities and places; the latter flows through Cracow, Sandomierz, Warsaw, Płock, Toruń, Gniew, and Tczew, and Gdansk is located at the river's mouth. The Oder, in turn, runs through Wrocław, Głogów, Kostrzyn, Szczecin, among others. Detailed analyses of the historical, cultural, and entertainment issues, as well as local specificities and the natural value of the river bank are beyond the scope of this research. However, the tourist attractions of Polish waterways and their surroundings constitute an opportunity for river cruises and should be promoted by their potential destinations.

Conclusions

The expansion of river cruising in Europe was visible from the beginning of the century. The season is getting longer, and there are now river cruises on offer almost year round. During summer months, many cruise ships sail non-stop on the Danube, Rhine, and other rivers. As in the ocean cruise segment, river cruisers and offers are diversified, e.g., river vessel capacities range from several passengers to nearly 200 – Viking Longboats.

Poland, in particular, has great potential for developing river cruising, as the tourist attractiveness of its itineraries is its main attraction. River cruising is a luxury product, and Poland can be perceived as a new, interesting destination.

However, the prime threat to this opportunity is the country's inadequate infrastructure, of which the poor condition of waterways is the greatest if not the only barrier of cruise development there. The programmes designed to improve the Oder and Vistula waterways and upgrade the rivers to IV class is the prime driver and requirement for river cruise growth.

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