

## **THE TOURIST INFRASTRUCTURE OF THE WATERWAY IN A SEGMENT OF THE LOWER WARTA RIVER**

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The Polish segment of the E70 International Waterway comprises an area stretching from the western border of Poland with Germany (the estuary of the Warta River) to Żuławy Wiślane (including the area surrounding the Polish part of the Vistula Lagoon). This waterway leads along the Warta River, the Noteć River, the Bydgoski Canal, the Brda River and the delta of the Vistula River. The intensity of the use of the existing waterway is low. This is caused, among other things by, the inadequate technical condition of some of the ports and harbours, and also by the limited supply of tourist services or lack of tourist infrastructure. Moreover, the tourist season on the waterway in question is limited to 3-4 months. The article suggests an idea for improvement in the tourist development of the area of the Lower Warta River, from Santok to Kostrzyn on the Oder River, by the location of point objects of infrastructure. They will create good conditions for mass and individual tourism in the segment of the waterway in question, which may result in the economic growth of the region, and also good neighbour relations with Germany. The organization of good infrastructure and a clever educational policy in terms of ecology may also contribute to minimising the bad influence of tourism on the environment.

Keywords: water tourism, objects of infrastructure

### **1. INTRODUCTION**

The Polish segment of the E70 International Waterway comprises an area stretching from the western border of Poland with Germany (the estuary of the Warta River) to Żuławy Wiślane (including the area surrounding the Polish part of the Vistula Lagoon). The planned modernisation of the E70 involves the construction of a network of ports, trans-shipment quays and shipyards, and also

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passenger and tourist harbours along the Warta River, the Noteć River, the Bydgoski Canal, the Brda River and the delta of the Vistula River, i.e. the Vistula River, the Martwa Vstula River to the estuary of the Śmiała Vistula River, the Szarpawa River, the Nogat River and the Królewiecka Vistula River, and also the internal sea waters of the Vistula Lagoon) and the Elbląg River [5]. The intensity of the present use of the waterways is low. This is caused, among other things by, the inadequate technical condition of some of the ports and harbours, and also by the limited supply of tourist services or lack of tourist infrastructure. Moreover, the tourist season on the waterway in question is limited to 3-4 months [3].

Water tourism, unlike a number of other kinds of active tourism, is accessible to people of all age groups as well as to the disabled. At the same time, it is connected with other kinds of tourism, such as:

- urban tourism, which makes it possible to go sightseeing from canals and river sides,
- nature tourism, which comprises a number of functions including educational, ecological or cognitive functions, it concerns mainly areas of the Nature 2000 network,
- historical tourism connected with learning about historical places, including a number of strongholds and castles as well as historical hydro-technical facilities,
- cultural tourism, including all kinds of reconstructions of historical and mythical events, fairs and folklore [4].

Because of the thickness of the hydrographical network water tourism can be developed in the whole country. It is estimated that in Poland there are:

- about 10 thousand lakes (which gives Poland second place in Europe in this matter just after Finland), among them 560 reservoirs of over 100 ha, from among them 320 dammed up lakes and 27 multi-purpose reservoirs,
- 23 thousand kilometres of rivers and 13 thousand mountain streams,
- 10 thousand kilometres of rivers, lakes and canals which can be used for canoeing – this number is increasing, because every year new routes are set; 15 thousand kilometres of routes are already accessible for canoeing,
- 756 kilometres of waterways, 3700 kilometres of navigable rivers [2].

As far as water tourism is concerned, because of special requirements and equipment necessary, the most common kinds in Poland are:

- sailing, including sailing and motor yachts,
- canoeing,
- windsurfing.

## 2. INFRASTRUCTURE OF A WATERWAY

While choosing a location for objects of infrastructure (ports, sailing harbours etc.), it is necessary to consider the type of vessels they will be used by, with special attention to their draught (Table 1).

Table 1. Types of yachts

Group	Type of yacht	Overall length $L_c$	Overall width B	Maximum draught $T_c$
		[m]	[m]	[m]
AM	very small	$4,5 < L_c < 8,0$	$< 3,3$	$< 1,0$
BM	small	$8,0 < L_c < 10,0$	$< 3,8$	$< 1,1$
CM	medium	$10,0 < L_c < 12,0$	$< 4,2$	$< 1,2$

Categories of vessels are also important (Table 2):

- category RA includes all small boats, among other vessels, rowing boats, canoes, pontoons, dinghies/jolly boats, surfing boards, open sailing and motor boats without cabins and not designed for the crew to spend nights in,
- category RB includes all small and medium vessels with cabins, yachts with sails and engines and yachts with engines which are designed for round the clock sailing,
- category RC includes large yachts with sails and engines which can sail on international water routes.

Table 2. Categories pleasure boats [6, 7]

Category	Overall length $L_c$	Overall width B	Maximum draught $T_c$	Maximum height of the water $H_v$
	[m]	[m]	[m]	[m]
RA	$< 5,50$	2,0	0,50	2,00
RB	$< 9,50$	3,0	1,00	3,25
RC	15,0	4,0	1,50	4,00

The above classification includes the parameter  $H_v$ , which is the distance between the highest point of a yacht (without the mast) and the surface of the water. This is particularly important because of the clearance under bridges and other over water obstacles

Before a location is chosen for objects of point tourist infrastructure it is necessary to analyse the following factors:

- the hydrological and navigational conditions of the reservoir; at this point it is necessary to analyse, among other things, the class of the waterway, junctions of waterways, conditions characteristic of the waters, the

occurrence of ice, waves, the layout of currents and changes in the speed of the main stream of the river and the movement of the rubble at the bottom,

- the physiographic conditions of the terrain; while considering this aspect it is necessary to pay special attention to the shape of the river bank, terrain morphology, the existence of overflow areas, the existing foliage and geological structure,
- demographic and economic conditions such as: the location within the boundaries of the capital town of the region or in the vicinity of towns with a considerable demographic and economic potential and more important villages,
- communicational conditions such as: access roads and the distance from the public transport centres,
- infrastructural conditions such as: the use of the existing hydrostructural facilities, and also the existing (in most cases considerably undercapitalised) canoeing, sailing and fishing harbours,
- cultural conditions connected to the neighbouring areas or the possibility of easy access by other available means of transport to the main areas with tourist attractions of anthropogenic origin,
- formal-legal; at this point it is necessary to analyse the situation in the area of potential investment in terms of ownership, planning, the existence or vicinity of protected areas according to regulations about environmental protection and location in areas protected by regulations about the protection of historic sites [1].

### **3. INFRASTRUCTURE OF THE WATER ROUTE IN THE REGION OF THE LOWER WARTA RIVER**

While choosing locations for harbours and ports in the region of the Lower Warta River a number of factors were taken into consideration, including:

- parameters of the waterway (depth, width) which determined the size of vessels,
- conditions of the river banks;
  - independent variables, which comprised: the size of the reservoir, urbanisation of the banks, their morphology, topography of the surroundings, strength and direction of the current or vegetation of plants,
  - dependent variables, which were: the size, length and speed of vessels, mooring frequency, number of stops on the way etc..

As far as differences in terms of the importance and tourist potential were concerned, the ports and harbours for tourist navigation in the region of the Lower Warta River were divided into:

- tourist port bases – they are objects of the highest rank, with full main and additional services (Kostrzyń on the Oder River, Gorzów Wlkp., Santok),
- tourist harbours – objects offering a limited range of additional services, but a full range of social services, and also fresh water and electric power (Słońsk and Świerkocin),
- mooring wharfs with back-up facilities – objects offering social services with sanitary fittings, located within administrative communes, without any other water infrastructure (Kłopotowo, Studzionka),
- mooring wharfs without back-up facilities – located at navigational obstacles – sluices and drawbridges, as waiting places (Wieprzyce).

While locating harbours and marinas the length of canoeing routes was taken into consideration; it is very important in the case of distances which take several or several dozen days to cover. They should be located 10÷15 kilometres from one another, and those where it is possible to stay overnight 20÷25 kilometres from one another.

The author suggests locating the following objects of point infrastructure in the region of the Lower Warta River (Table 3).

Table 3. Locating of point infrastructure in the region of the Lower Warta River

No	Location	Category	Km of the river
1	Kostrzyn – existing, intended for the modernization of the tourist port base	RC	2,450
2	Słońsk – planned tourist harbour	RB	14,200
3	Kłopotowo – planned mooring wharfs with back-up facilities	RA	19,000
4	Świerkocin – planned tourist harbour	RB	22,050
5	Studzionka - planned mooring wharfs with back-up facilities	RA	31,000
6	Wieprzyce - planned mooring wharfs without back-up facilities	RA	50,000
7	Gorzów Wielkopolski – existing, intended for the modernization of the tourist base port	RC	57,340
8	Santok – existing, intended for the modernization of the tourist base port	RC	68,200

The analysis of the present condition of the point infrastructure of the water route in the segment of the Lower Warta River has shown that the existing objects (Kostrzyn on the Oder River, Gorzów Wlkp., Santok) are undercapitalised and need modernisation, and the other objects do not exist.

Nevertheless, their construction will improve considerably the conditions of using the water route under discussion because it will become more accessible both for motorboats as well as canoes. At the same time it will become more attractive.

#### 4. CONCLUSIONS

Unlike land walking, cycling or horse-riding routes, the location of water routes is completely determined by the existing hydrographical system, and using water ways depends on the condition of the water infrastructure (networks of harbours and ports) and hydrographical objects (the layout of dams, sluices, weirs), the capacity of the waterway, the presence of installations over the surface of the water (water bridges, railway bridges, pipelines, power networks), and also – seasonal changes in the condition of the waters. The vicinity of water routes is an ideal place for locating other tourist routes (walking, cycling and horse-riding routes). This is due to the fact that they are far away from transit roads (with cargo traffic), attractive sights and nature as well as the possibility of using common hostels, hotels and restaurants. Water tourism, especially canoeing, is the least harmful to the environment way of sight-seeing in areas valuable in terms of nature. However, in order put this idea into effect it is necessary to take care of the correct location of objects of point infrastructure along water routes.

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## INFRASTRUKTURA TURYSTYCZNEGO SZLAKU WODNEGO NA ODCINKU DOLNEJ WARTY

### Streszczenie

Polski odcinek Międzynarodowej Drogi Wodnej E70 swym zasięgiem obejmuje obszar rozciągający się od zachodniej granicy z Niemcami (ujście Warty), aż do Żuław Wiślanych (wraz z terenami okalającymi polską część Zalewu Wiślanego). Szlak ten prowadzi wzdłuż Warty, Noteci, Kanału Bydgoskiego, Brdy oraz Deltę Wisły. Intensywność obecnego wykorzystania szlaków wodnych jest niska. Spowodowane to jest, m.in. niezadowalającym stanem technicznym części portów i przystani, a także - ograniczonym zapleczem usług turystycznych lub brakiem tejże infrastruktury. Ponadto, sezon turystyczny na omawianym szlaku jest ograniczony do 3 - 4 miesięcy. W artykule zaproponowano poprawę rozwoju turystycznego w rejonie Dolnej Warty, od Santoku do Kostrzyna nad Odrą, poprzez lokalizację punktowych obiektów infrastruktury. Stworzą one dobre warunki dla turystyki zbiorowej i indywidualnej na omawianym odcinku rzeki, co może spowodować wzrost znaczenia gospodarczego tego rejonu, a także zacieśnienie się relacji sąsiedzkich ze stroną niemiecką. Zorganizowanie właściwej infrastruktury i prowadzenie przemyślanej edukacji ekologicznej może również przyczynić się do zmniejszenia presji turystyki na środowisko.

