

A STUDY OF SIZE AND STRUCTURE OF TOURIST MOVEMENT IN 1998–2010 AROUND THE ZEMBORZYCKI RESERVOIR IN LUBLIN

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Summary. The Zemborzycki Reservoir is located in central-eastern Poland, within the administrative boundaries of Lublin city. This is a dam reservoir, built on the Bystrzyca River. One of the main objectives of its establishment was to ensure for the inhabitants of Lublin a convenient place to spend their free time. According to measurements, at the beginning of its existence – in the '70s of the 20th century – on summer weekends the Zemborzycki Reservoir was visited by about 30 thousand people. By early twenty-first century, mainly because of worsening ecological condition of the reservoir, this number has decreased drastically: 10–15 times. Since the beginning of the twenty-first century, the city authorities began to undertake various efforts to improve the ecological condition of water of the Reservoir, but those activities did not generate desired effects. Because of the lack of improvement of water quality, the city authorities decided to build artificial pools in one of the sectors of the Reservoir shoreline. Then the volume of tourist traffic has increased about 2-times, but only in the newly invested sector.

This article presents the results of measurement of tourism size and structure in the Zemborzycki Reservoir region in the years 1998–2010. The results of these studies, combined with data from literature on changes in the ecological condition of the reservoir, were used to formulate conclusions on the interaction between natural and landscape values of the suburban recreational reservoir, and the way of land use, size and structure of tourism in its surroundings. Summary of the work are conclusions concerning needs for changes of model development and land use of the Zemborzycki Reservoir and its surroundings.

Key words: Tourism, rest, spatial planning, recreational use, land-use, Zemborzycki Reservoir

INTRODUCTION

A United Nations study on the impact of tourism on the economy and natural environment has pointed out that, whilst tourism frequently confers economic advantages on the host country, it can be also a cause of environmental disruption [Costs and Benefits... 1979]. This tendency can be seen in many places, also in Poland.

As the area of study the most popular aquatic recreation area of the city of Lublin – the Zemborzycki Reservoir (Fig. 1) was chosen.

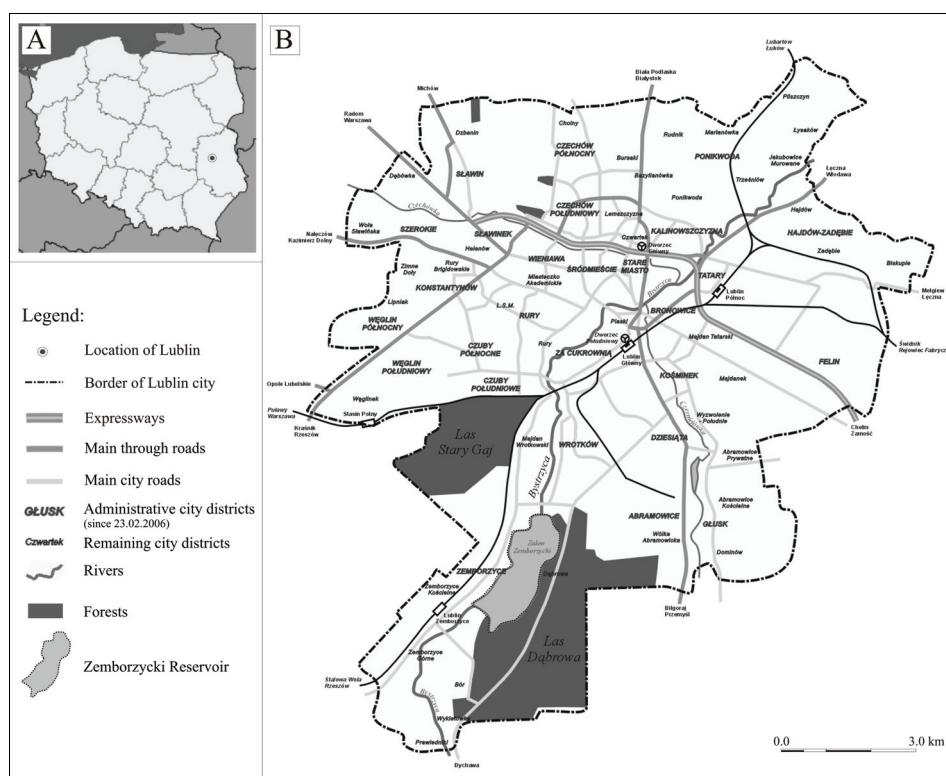


Fig. 1. Location of the study area: A – on the background of Polish administrative borders, B – on the background of administrative borders of Lublin

This is a dam reservoir built on the Bystrzyca river. One of the main objectives of its establishment was to ensure for the inhabitants of Lublin a convenient place to spend their free time. In the second half of the '70s and the first half of the '80s of the 20th century, during the top period of popularity, over 30 000 people accumulated on the Zemborzycki Reservoir per day. During that period, the water quality of the Reservoir was good, including rich aquatic and coastal vegetation in the Bystrzyca valley and in the reservoir, which allowed the development of many forms of recreation, despite relatively weak development of supporting infrastructure [Chmielewski *et al.* 1998].

The worsening of ecological conditions in the suburban area of Lublin, including natural degradation of the Reservoir [Radwan (ed.) 2006], with simultaneous development of recreational planning in other Lublin regions – richer and more beautiful natural landscapes, caused that the number of people taking their rest on the Reservoir has decreased drastically: 10–15-times at the beginning of the 21st century.

The main objective of this research was analysis of changes in the size and structure of tourist traffic in the Zemborzycki Reservoir region in the period 1998–2010. The results of these studies, combined with data from literature on changes in the ecological condition of the reservoir, were used to formulate conclusions on the interaction between natural and landscape values of the suburban recreational reservoir, and the way of land use, size and structure of tourism in its surroundings. Summary of the work are conclusions concerning needs for changes of model development and land use of the Zemborzycki Reservoir and its surroundings.

METHODS

Data concerning the volume of tourist traffic over the Zemborzycki Reservoir in the 1970s are only estimations in character and come from summary reports from the Department of Sport and Tourism of Lublin City. Measurements of size and structure of tourist traffic in the region of the Zemborzycki Reservoir were conducted in 1998 [Chmielewski *et al.* 1998], 2000 [Szadkowski 2001], 2006 [Waryszak 2006] and 2010. In those studies the method of momentary



Fig. 2. Sector scheme of the Zemborzycki Reservoir: A. Marina, B. Zemborzyce, C. Wrotków, D. Dąbrowa

measurement was used [Chmielewski and Michalak 1989, Chmielewski 2001]. The accuracy of studies performed by individual authors was different. In 1998, measurements were conducted once: on Sunday, August 9th. Measurements in 2000 and 2006 were made on selected weekdays and at weekends, from May to August (covering, in total, 20 days in 2000 and 27 days in 2006), while in July and August 2010 – a total of 8 days. In all of those study years tourists were assigned to one of the following 7 groups: beach users, restaurant visitors, people at residential accommodations, strollers, cyclists, sailors, anglers. In 2010 an additional analysis of spatial arrangement of resting in various sectors of the Reservoir was made (Fig. 2).

RESULTS

Estimates from the Department of Sport and Tourism of Lublin City showed that in the '70s of the 20th century 30 000 people rested daily near the Zemborzycki Reservoir. In the mid-'80s the recreational traffic is estimated at about 15 000 people, which is 50% of the baseline. In 1998, the average number of people resting around the Zemborzycki Reservoir at the weekends was only 2540 (lack of data relating to weekdays). Subsequent studies, years 2000 and 2006, showed a continuing decline trend. In 2010 an increase was observed in the average number of tourists which amounted to 4640 people at weekends, and 2019 people on work days. These values were higher than the measurements performed in 2006 by about 68% on the weekends and about 75% on work days, and by 56 and 41%, respectively, than in 2000. In all years the popularity of the Reservoir sites was remarkably higher during weekends. The total number of tourists encountered during the 10 weekend days in July 2006 was almost twice as high as the number of people spotted during the remaining 21 work days (Fig. 3).

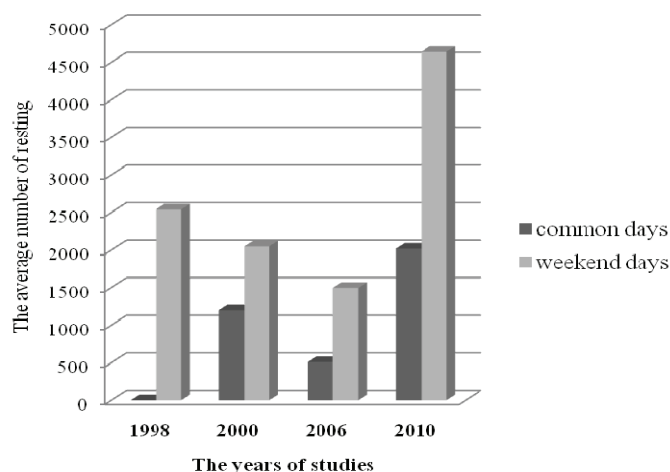


Fig. 3. Average number of tourists resting around the Zemborzycki Reservoir in individual years of studies

In 2000, the highest number of tourists were found in August, while in 2006 and 2010 – in July. In July 2000 the number of people resting around the Zemborzycki Reservoir represented 16% of the volume of tourist traffic in 2010, and 2006 – 30% of the pool, while in August – 39 and 21% (Fig. 4).

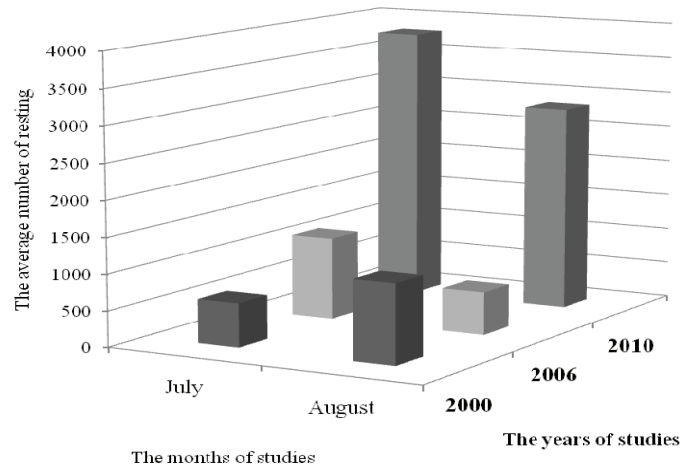


Fig. 4. Average number of tourists in summer 2000, 2006 and 2010

In 1998 and 2010 the structure of distribution of tourist traffic in various sectors of the coast of the Zemborzycki Bay (Fig. 2) was studied. Tourist traffic load in 1998 was concentrated mainly in two sectors: Marina and Dąbrowa. A different situation was drawn in the year 2010, when Wrotków attained a distinct advantage over the rest of the sectors. Wrotków attracted 61% of the total number of tourists in 2010, an increase of interest as high as 90% in relation to 1998 (Fig. 5).

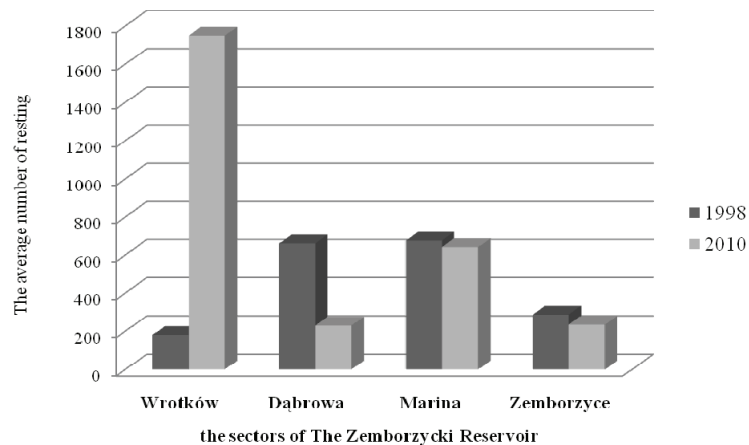


Fig. 5. Average number of resting people in August 1998 and 2010, in various regions of the Zemborzycki Reservoir coast

The intensity of recreational use of the Zemborzyce Reservoir does not have any significant influence on its structure. Tourist activities display the same pattern throughout the week. Beaches are the most popular sites. They account for 45–52% of total tourist traffic in this area. The second most popular place among the visitors are restaurants (19–25%). Strollers make up 12–16% of tourists visiting the Reservoir. Respectively, cyclists are 9% and 7%. The least numerous group of recreants are the anglers, sailors and people at residential accommodation (Fig. 6)

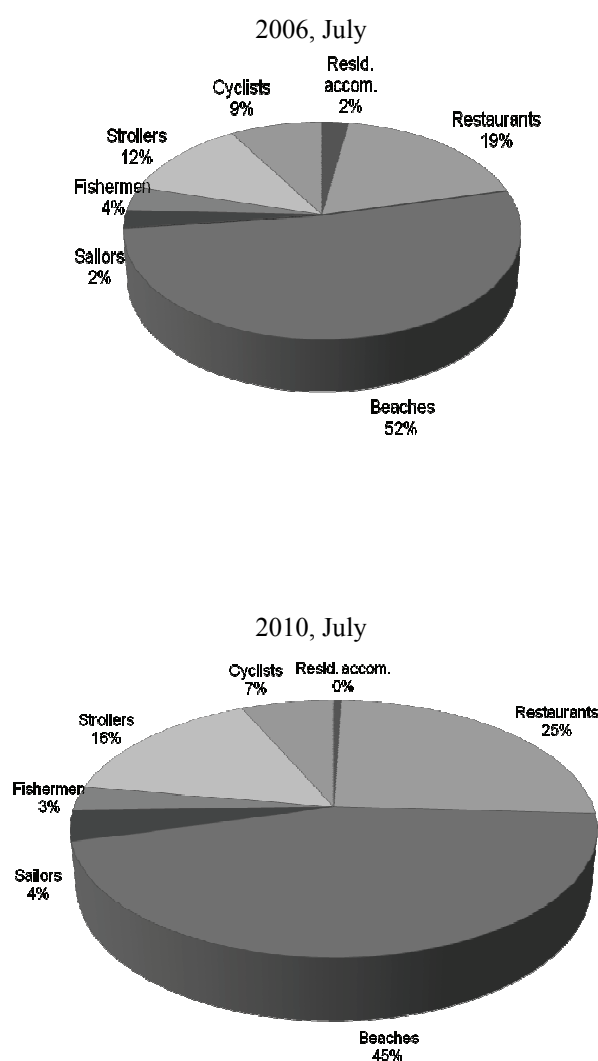


Fig. 6. Structure of tourist movement in July 2006 and 2010. The size of the disc reflects the proportions of tourist movement in respective years

DISCUSSION

The changes are more noticeable only if we consider the estimated values from the first years after the creation of the reservoir. On average 30 000 people a day stopped here for recreational reasons in late 1970's, while at the present moment their number does not exceed 3000 during holidays in 2006 and 5000 in 2010.

The oscillations in the number of people spending their time around the Zemborzycki Reservoir were mostly due to the weather conditions. May and August of 2006 were dominated by cold and rainy days, while at the respective time in 2000 it was warm and sunny. The reservoir sites are also more popular during public holidays and weekends.

Three main reasons are emerging for rapid drop in the number of tourists within the last 30 years. Firstly, intensive agricultural activity in the basin of the Zemborzycki Reservoir contributes to its eutrophication. In the course of time the water of the reservoir has become shallower and more fertilised [Radwan (ed.) 2006, Smal and Ligęza 2006, Chmielewski (ed.) 2009]. Massive blooms of Cyanobacteria observed in years 2000–2008 were the evident proof of this process. The banks of the Zemborzycki Reservoir were strengthened with concrete on about 64% of its circumference, which caused destruction of the littoral zone – very important for the ecological condition of reservoirs (including cleanness of water), and prevented natural regeneration and considerably reduced the aesthetic values of the Reservoir (Photo 1).



Photo 1. The concrete-strengthened western bank of the Zemborzycki Reservoir (Kułak 2009)

The visible growth of interest in spending leisure time over the Zemborzycki Reservoir in 2010 is associated with the sequence of activities undertaken by the Lublin City Council since 2007, aimed at improving the ecological condition of the reservoir. These works included, among others, changing the structure of

fish fauna (reduction of herbivorous fish to increase the participation of predators) and attempts to apply „biofilter” plants in the form of small floating islands. The blooms of Cyanobacteria were successfully eliminated after several years, but water quality of the Reservoir and the aesthetics of its surroundings management were still not satisfactory [Chmielewski (ed.) 2010, Sender (ed.) 2010]. At the same time, together with those actions, a lot of investment aimed at increasing the attractiveness of recreational offer was made. Mainly that included the building of a water ski lift, artificial pools „Sunny Wrotków” in the north-eastern sector of the Reservoir, or a bicycle path along a part of the western bank. The construction of the swimming pool complex in Wrotków caused a significant increase in the number of people resting there (Fig. 5.). However, the main objective of resting are artificial pools, not natural reservoir values. Unfortunately, the aesthetic values of the newly introduced elements of recreational planning are very low, and in many cases even exacerbate a degradation of landscape values of this area (Photo 2 and 3).

That is why radical actions need to be undertaken in order to save the Zemborzycki Reservoir from further degradation. There is apparently a need for a well-integrated land management. The restoration actions must include some means of stopping the nutrient inflow. It might be achieved by building a preliminary reservoir, removing sediments, and restoring vegetation along the reservoir and river banks.



Photo 2. Recreational device in „Sunny Wrotków” complex (Kułak 2010)



Photo 3. Railing along the bike path on the Zemborzycki Reservoir (Kułak 2010)

The packet of proposals for remedial action

To improve the water quality of the Reservoir, the following activities should be done:

1. Exclusion of the bottom of the valley of Bystrzyca River and a belt at least 50 meters away from the Zemborzycki Reservoir from building, elimination of surface and other forms of land cover leaving only the natural ones, designation and enrichment of natural „ecological corridors”, linking the Reservoir with the surrounding natural complexes,
2. Elaboration of a comprehensive program of improving the ecological status in the whole upper basin of the Bystrzyca River and the Zemborzycki Reservoir, and beginning of its systematic implementation.
3. Continuation of successive furnishing of the belt of littoral vegetation, which purifies the water of the Reservoir, and the belt of bank vegetation, to protect against confluence of surface contamination from agricultural-recreational areas and settlements surrounding the reservoir, which was started in 2010 by building a system of phytolittoral lagoons [Sender (ed.) 2010].
4. Elaboration of a project of natural rehabilitation and revitalisation of development of the Zemborzycki Reservoir area, together with the green device plan. An emphasis is required on the fact that the tourist development of water reservoirs and other recreational areas should be based on the principle of special protection of their natural recreational and landscape values.
5. Carrying out monitoring of ecological, social and physiognomic (tourist movement) effects of undertaken works.

CONCLUSIONS

Compared to the 70s of the 20th century, the number of people resting around the Zemborzycki Reservoir dropped 6 times. This phenomenon is associated with significant deterioration of the Reservoir ecological condition and with recreational land development in other areas of the Lublin region.

Observed increase in the number of tourists in 2010 is caused by recent investments in tourism infrastructure development in the Wrotków sector, which does not solve the main problem because it does not result in any improvement of the ecological condition of the Reservoir.

Improving the Zemborzycki Reservoir ecological condition, natural regeneration of surrounding forest and grassland ecosystems, and restoration of historical green agreements (Marina sector) should be priority tasks, realised **in advance** in relation to the modernization and development of recreational land surrounding the Reservoir.

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BADANIA WIELKOŚCI I STRUKTURY RUCHU TURYSTYCZNEGO WOKÓŁ ZALEWU ZEMBORZYCKIEGO W LUBLINIE W LATACH 1998–2010

Streszczenie. Zalew Zemborzycki jest położony w środkowo-wschodniej Polsce, w granicach administracyjnych miasta Lublin. Jest zbiornikiem zaporowym, zbudowanym na rzece Bystrzycy. Jednym z głównych celów jego utworzenia było zagwarantowanie mieszkańcom Lublina dogodnego miejsca do spędzania wolnego czasu. Na początku swojego istnienia – w latach 70. XX w. – w letnie weekendy Zalew Zemborzycki odwiedzało wg szacunkowych pomiarów ok. 30 tys. ludzi. Do początków XXI w., m.in. z powodu pogarszającego się stanu ekologicznego zbiornika, liczba ta obniżyła się drastycznie: 10–15-krotnie. Od początku XXI w. władze miasta zaczęły podejmować różnorodne próby poprawy stanu ekologicznego wód Zalewu, jednak nie przyniosły one pożądanego efektu. Nie mogąc doprowadzić do poprawy stanu czystości wód, władze miasta zdecydowały się na budowę zespołu sztucznych basenów w jednym z sektorów pobraża zbiornika. Wówczas wielkość ruchu turystycznego wzrosła ok. 2-krotnie, lecz tylko w nowo zainwestowanym sektorze.

Artykuł prezentuje wyniki pomiarów wielkości i struktury ruchu turystycznego w rejonie Zalewu Zemborzyckiego w latach 1998–2010. Wyniki tych badań zestawione z danymi z literatury na temat zmian stanu ekologicznego zbiornika posłużyły do sformułowania wniosków na temat wzajemnych zależności między wartościami przyrodniczymi i krajobrazowymi podmiejskiego zbiornika rekreacyjnego a sposobem zagospodarowania terenu oraz wielkością i strukturą ruchu turystycznego w jego otoczeniu. Podsumowaniem pracy są wnioski dotyczące potrzeb zmian modelu zagospodarowania i wykorzystania Zalewu Zemborzyckiego i jego otoczenia.

Słowa kluczowe: turystyka, wypoczynek, planowanie przestrzenne, zagospodarowanie rekreacyjne, użytkowanie ziemi, Zalew Zemborzycki