

LAKE PALIC – A TOURIST CENTRE IN THE VOJVODINA**Stankovic M. Stevan**The Geographic Faculty, University of Belgrade,
Studentski trg 3/III, Belgrade 11000, Yugoslavia**Abstract**

There are many attractive centres in Vojvodina. One of them is the Lake Palic, which has a long and rich tradition in tourism. This is a result of a convenient geographic position, closeness of Subotica and attractiveness of wide aquatoria suitable for swimming, bathing and water sports. The warm lake water and mud rich in minerals have been used for therapy, which enables us to talk about health and therapeutical tourism. The first bath tubs for balneotherapy were installed in the middle of the last century, when they built first reception capacities. This is when a large park was created which gave the plain certain characteristics of a tourist attraction.

In the period after the World War Two, a number of tourists coming to the Lake Palic increased until 1970s. Then, the water became polluted, followed by the sanitation of the lake, a process that was unique at that time. First the lake was emptied, and then the mud was carried away from the bottom. The bank area was arranged and the facilities for the cleaning of the Subotica's wastewaters were installed. The filling of the lake with water again represented a new beginning for tourism. With huge investments, they have arranged and organized the 387 h of the lake for tourists. The main problem of the Lake Palic is to keep the water clean because this is its most important tourist value.

There are very detailed plans for organizing the Lake Palic to meet the needs of tourists. The Lake Palic has been developing as multifunctional tourist centre of Vojvodina. The holiday, transit and spa tourism have been developing, the mud bathroom have been renovated, sport and cultural events organized as well as scientific and business meetings. The lake should be treated together with its surroundings and the Lake Ludos, which is an ornitologic station protected by law.

Key words: the Lake Palic, Vojvodina, tourism, sanitation, evaluation, number of tourists, number of overnight stays, types of tourism.

The origins of the Lake Palic

Wide and plain, monotonous at first, Vojvodina has a geographic variety as much as other parts of Serbia. She is interesting for tourist and scientific research and has been presented in a number of books. In this wide plain, disturbed by steep cuts of loess plateaux and not so steep island mountains there have developed specific and genetically interesting meso- and micro- forms of relief with various hydrographic objects. They have a certain economic importance and have been used for navigation, drainage, irrigation, fishing, water supply, sports, recreation and tourism. The water treasures of Vojvodina have not been used enough and that needs to be overcome because water is a prerequisite for further progress. Some hydrographic objects in Vojvodina, genetically, evolutionary, physically and chemically are beyond comparison with the ones in other parts of the world.

Natural and artificial lakes complete the variety of hydrographic network of Vojvodina. The most interesting group is on the north of Backa, not far from Subotica. These lakes were known in the

ancient times and had various uses. They impressed many researchers and travel writers who described them in their books. Among the lakes on the north of Backa, the most distinguished and world-famous one is the Lake Palic. It is situated between the sandy dunes of Suboticko-bajska sandy desert and the loess deposits of the Backa loess plateau. Because of its location in the area with small precipitation, it has attracted many researchers, fishermen and tourists. It has been examined well through research in geography, biology, hydrography, balneology and tourism.

“In the outskirts of Subotica, on the spot where today there is a group of lakes, there was, in the beginning of dilluvium, a relatively large lake. The depth of the lake was uneven; the greatest depth was where in the basins of the present lakes, but between these depths, and in the parts near the bank, there were shallow waters surrounded by slag and similar vegetation. During the deposition of sand and loess, the lake was flowing towards Tisa. The mentioned vegetation formed an obstacle for sand and loess and caused its deposition. This material had for some time fallen down into the lake, but then it flew into the Tisa. This is why the loess plateau ends on the eastern side of the Lake Ludosko. This is how loess plateaux and sandy deserts were gradually been formed, and more shallow parts of the lake were covered up. At the same time, this is how we can explain the islands – dunes in the swampy part of the Lake Ludos. Later, when this area, because of climate shifts, started to receive a smaller amount of precipitation, when shallow waters were covered up, the lake was transformed into several smaller ones, out of which we have four today” (Dugonic, V., 1956). The four lakes mentioned in the above passage are Palic, Ludos, Krvavo and Slano lakes. The Lake Palic is wider and more famous than the other three.

For the creation of the above-mentioned lakes, one fact is also important – under sand and loess there is a layer of whitish clay that is not letting the water pass through. The clay was deposited on the bottom of the mentioned lakes, before sand and loess. Although the clay is waterproof, sand and loess were easily moved in the past, taken away by aeolian erosion, and there has been a denudation and water captured between the dunes, i.e. between the borderline of sand and loess. The lakes Palic, Krvavo and Ludos are connected with a shallow valley. It has been used for the digging of the canal. Where there is no water in it there is thick vegetation. The record show that in 1942, the river Tisa was hydrologically connected with the river Keres, by the mentioned valley because of the extremely high water level. Some sorts of fish, which live in the Lake Palic and the river Tisa also, prove this fact. Nevertheless, the hydrographic connection of the lakes Palic and Ludos with Tisa is important for the water levels of these lakes and was established during the sanitation of the lake Palic (Dugonjic, D., 1973).

The Lake Palic is situated not far from the borderline of Yugoslavia and Hungary. Near the lake, there is a road and a railway line of international importance. These traffic systems connect Belgrade, Novi Sad and Subotica with Szeged and Budapest. Being situated near the mentioned traffic systems, and not far from border crossings Horgos and Kelebija, the Lake Palic has exceptionally convenient transit location, which is important for the development of tourism.

From the written documents, we can find out that Palic had different names in the past. They are: Palij, Palegyhaza, and Paligo Palus. The Suboticko-bajska sand desert is situated on the north of the lake, and Backa loess plateau on the south. The sandy desert was soon covered with crops, and loess plateau was cultivated well. The lake is on 102 m sea level and represents a basin where underwater of the area is drained (Selesi, Dj., 1973).

Because of the changes of the level, the dimension of the lake during the time it existed naturally was frequently change. The lake was 7 km long, and the bank line was up to 17 km long. The surface of the lake was 5.6 km². Certain parts of the shallow bank belt were covered with thick hydrofoil vegetation, which enlarged the water vapour and contributed to eutrophic processes in the lake. The development of vegetation was instigated by the temperature of the lake water and the

bottom of the lake covered by mud rich in minerals. The depth of the lake was never over 2.5 m. In the large, but shallow basin, there were around 9 millions km³ of water. During summer the temperature of the lake water was up to 25°C and was convenient for swimming and other water sports. The swimming function of the lake Palic was as important as its transit function. Of course, the swimming season lasted about three months, and transit season during the whole year (Duric, B., 1953).

The development of tourism

The Lake Palic was first mentioned in the written documents of the Middle Ages. In an entry from 1462, the Palij desert was mentioned. The name is similar to the present one so it can be assumed it is the same for the lake. In a Turkish document, dated 1580-1582, we can find Palegyhaza. There is some record that the residents of the surrounding settlements, chased by the Turks hid in the slag of the Lake Palic. It is also known, that in 1697, the army of the Eugene Savojski (1663 – 1736), an Austro-Hungarian leader of French origin, who became famous during the war against Turks, was stationed near the lake. They were near the Lake Palic during the battle at Senta, where he gave the Turks a final blow. After that, a peace was signed in Sremski Karlovci in 1699 and Austria penetrated towards south. On a map from 1727, the general L.F. Marsili drew a lake near Subotica and marked it as Paligio Palus (Stankovic, M. S., 1989).

The warm lake water and mud rich in minerals found at the bottom had a certain therapeutic importance. The residents of the neighbouring settlements first noted the therapeutic effect of the lake water and mud. By the end of 18th and beginning of the 19th century, Palic received special attention as a spa centre. Even in 1845, there were installed first baths for the treatment of sick visitors. Ten years later, a mud bath was built. Almost every building (Trscara, the Old Hotel) was expanded and some new ones were built. In this phase of the lake bank development, a large park was created near the northern and northern-eastern part of the lake. Palic was soon connected with Subotica by railway line. The number of guests from neighbouring and more remote parts shows that the balneologic function is very important for Palic.

A calm and peaceful lake, water and mud rich in minerals, a large park, walking paths, accommodation and catering capacities, cuisine, transit, bathing and health tourism made Palic the exceptional tourist centre of Vojvodina.

The tourist importance of the Lake Palic has been recognized since the beginning of the World War Two. Until 1969, the number of domestic tourists and their overnight stays increased. A number of foreign tourists also increased, for example, in 1969 there were 7000 with 11 400 overnight stays. Since 1970, the number of tourists and their stays has begun to decrease. In 1971, the lake was so polluted that it had to be drained. In the period from May 1971 to May 1977, we cannot speak of Palic as a centre of tourism, because there was no lake. The number of tourists increased in 1978, but it decreased together with the number of stays in 1969 and was far less than the one before nine or ten years. The situation became worse in 1982, when the total number of tourists was less than in 1969, and the number of stays less than in 1957. After 1985, a certain increase in a number of tourists was evident, but it only lasted until 1990, when Palic recorded another financial breakdown. Statistics reminds the one from before three or four decades. Today, we are facing a new beginning. The time will show whether Palic can bring the tourists back and achieve a hundred thousand stays a year, which would be in proportion to its value and potentials.

Table 1. The number of tourists and overnight stays in the Lake Palic

The pollution of the Lake Palic

Because of the small capacity of the lake's basin and more intensive development of Subotica, the Lake Palic was filled with a great quantity of wastewaters. Subotica lies 10 m higher than the lake Palic. The parts of the town called Jasibara and Rogina bara are situated on the former depressions where water was withheld and then slowly flew away towards the lake. In the last century, Subotica used this natural advantage and directed its sewage pipes towards Aleksandrovo and the final western part of the Lake Palic. The lake was slowly dying out. The biologic death of the lake, caused by the pollution of the water, meant its hydrologic death as well.

Since the end of the last and the beginning of this century, they have begun to think about the cleaning of the wastewater which was poured down into the Lake Palic. Until 1969, there were many development plans drawn up, but they were never realized completely. A temporary solution was to separate 30 h of the lake for the reception of wastewaters. In 12 years, the reception zone was filled with insoluble materials, so it lost its primary function. Meanwhile, a quantity of wastewaters increased up to 13.000 m³ a day. In May 1971, This situation caused a sudden death of fish. The main cause for the poisoning of the living beings was sulphur-hydrogen released in polluted mud that has been depositing on the bottom of the lake for years. Dj. Selesi writes about it: "By the middle of May, before the City Council has made a decision for the cleaning the lake looked like this - on the bottom there was a thick smelly layer of mud, water was completely green, slag along the bank was thin and sick, there were many red water fleas, and the surface was covered with tens of thousands of dead fish. Thia picture of the lake was soon changed again, because algae also died of the lack of oxygen, and the dead fish, their heads buried in the mud, began to decompose. Many astonished people gathered to watch the agony of the lake, no one wanted to swim, they only felt pity and compassion."

By the end of May 1971, the City Council of Subotica made a decision to sanify the Lake Palic. A detailed programme was soon developed, consisting of the following elements:

- Emptying of the lake's basin
- Taking away the mud from the bottom of the lake
- Cleaning of the wastewaters of Subotica
- Filling the basin with water again
- Building the tourist objects and evaluation of the lake.

In January 8 1972, the elaborate and unique works on the sanitation of the Lake Palic started. On that day, they began the drainage of the lake, by the special canal towards the Lake Ludos. The drainage was finished in relatively quick time. About 8 000 000 m³ of polluted water flew through the canal 5 km long. The method of the complete drainage of the lake was used because it was known that a lake would drain out on its own during extremely dry and hot years. From the written documents, we can see that the Lake Palic was without water in 1794 and 1863, "when after several consecutive dry years the Lake Palic dried out and roads crossed its bottom. Low water levels were noted in 1932, 1946 and 1952 when summers were very dry and the lake was more like a swamp with thick mud and shallow water, because water was far away from the bank leaving the mud behind." On the dried bottom of the lake, it was easier and cheaper to do all the works. Thus, Palic became "a lake without water".

The cleaning of the polluted mud from the bottom of the lake was done with modern machinery. The quantity of mud which was deposited in the period of time, was not even in every part of the lake. In some places it was up to 2 m. More than 2 200 000 m³ of mud and roots of the water plants were thrown on the lake-bank area. A part of this material was used as a building material for the walls dividing the four newly formed sectors of the lake. The first sector covers 17.6 h and is 2.5 m

deep. Together with the facilities for the water cleaning, it is situated in the furthest west side of the basin. The surface of the second sector is 92 h, serving as a container for the cleaned water and further water improvement. There are three small islands here so that birds whose habitats were disturbed by the works can settle on them. The third sector covers 80 h. It is followed by the fourth sector, which is the biggest one (380 h) and was created for the tourists. This part of the lake is filled up only to 102 m so that a stable level can be maintained. The excess water from the second part is directed through the canal towards the Lake Ludos. Similarly, the tourist part of the lake has a canal towards Ludos.

The cleaning of the wastewaters of Subotica has been the most important problem. It has been established that the entire city industry should have facilities for water cleaning. The cleaned water together with the sewage water is directed to the central cleaning machine with a basin for depositing and aeration where it stays for 25 days. After that, it is directed into sector 2, sector 3 and partly into the tourist part of the lake.

In order to fill the Palic up to 102 m, 11 000 000 m³ of water was needed, because the basin was 40 cm deeper than before. The basin was filled with water during 1975 and 1976. The first fish was stocked in 1977. Since then, the lake has been used for sports, recreation and tourism again.

It is important to emphasize that the facilities for dephosphorization have not been installed. This is why some negative results occurred. Some of them were solved by the canal from the second sector towards the Lake Ludos." And after that, because of the development of the city and its industry, followed by the production of wastewater, the lake again became full with higher concentration of nutrient elements. The result was gradual continuation of the eutrophic process and increase of the trophic degree. After the sanitation, the concentration of salts in the lake water was 1,449-g/m³ and sulfates 682 g/m³. The quantities decreased gradually during the next 15 years, and by the end of 1991, they were 749 g/m³ of salt and 184 g/m³ of sulfates in the tourist part of the lake. Accordingly, the tourist lake belongs to the sodium-chloride type of waters. This characteristic is a result of antropogenic process, i.e. the influence of wastewater" (Group of authors, 1993).

The building of new and reconstruction of the existing object in the lake-bank of Palic is a basis for its tourist evaluation. According to the regional planning, the lakes Palic and Ludos are treated together with a number of functional connections with Subotica, transit traffic systems, hunting areas, archeological sites, sports and cultural events. Its balneologic function is not forgotten because through the drill they can reach thermomineral water which together with peloids can be used in treatment of many diseases. The Lake Palic is developed as a multifunctional tourist centre (Stankovic, M.S. 1980).

The existing tourist companies take great effort for the development of tourism. It is developed as a spa, holiday, nautical, transit and cultural centre. The hunting and fishing packages influence the variety of tourist offer. By the restoration of several picturesque buildings, the Lake Palic got back its full glow.

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