

# COOPERATION IN THE NAVIGABLE COURSE OF THE SAVA RIVER

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The river Sava, being a big river, has always had an important role in the lives of people who live in this region. It was the biggest national river of former Yugoslavia and it connected former Yugoslav republics: Slovenia, Croatia, Bosnia and Herzegovina and Serbia. Its spring is in the northeast part of Slovenia, upstream from Radovljice town. The Sava is created by two headwaters, Sava Dolinka and Sava Bohinjka. In its flow through Slovenia the river Sava has made composite valley. In its further course from the confluence of Krajina to Belgrade the river Sava is typical plane river. Its course from the spring of Sava Dolinka to the confluence into the Danube is 945,5 km long and its length from the point where Sava Dolinka and Sava Bohinjka come together is 895 km (5). Direction of its course is west-east and the river basin stretches in the same direction. Its course is wider going near to the confluence of the river Drina, where it reaches its greatest width, whereas going further towards Belgrade its width lessens. Assymetry is one of the characteristics of the river Sava. It is wider at the right side of its river basin which occupies 77,8 % of the whole river area, whereas its left side occupies only 22,2%. Its course is 446 km long in Croatia (1,4). As a natural border between The Republic of Croatia and Bosnia and Herzegovina its length is 300 km (from 507 to 207 km of the river course) (1,4). It enters the territory of Serbia at Jamena village. Its course is 207 km long in Serbia. From 207 km to 174,3 km the river Sava is the natural border between the Republic of Serbia and Bosnia and Herzegovina (2). At 174,5 km there is a confluence of her biggest tributary, the river Drina. About 28% of the river Sava basin represents the Drina river basin. About 21% of its water the river Sava gets from the river Drina (5). The Drina approximately brings about 370 m<sup>3</sup>/s of water (3). Water regime at the river Sava is more influenced by high water level regime of the river Drina, especially if it comes together with high level of water in the Sava. Thus, in April, when the river Sava has huge amount of water, it gets more than 640 m<sup>3</sup>/s from the Drina, whereas in May, Drina has 620 m<sup>3</sup>/s. Minimal flow of the river Drina is in September (117 m<sup>3</sup>/s) (3). The Drina has fluctuations in water level and its flow, so that in average it has flow over 2500 m<sup>3</sup>/s in two or three years, and every 15<sup>th</sup> year its flow is more then 4000 m<sup>3</sup>/s (3). High level of water of the river Drina occurs during all seasons, but it is more frequent in summer. The unstable regime influences regime of the river Sava at its lower course in Serbia.

Further development of nautical tourism at the river Sava is conditioned by the existence of defined navigable course, piers and wharfs, as well as touristic capacities. During the nineties of the last century the navigable course of the river Sava was neglected in Serbia as well as in its flow through Croatia and Bosnia and Herzegovina. It is possible to sail down the river now, but you have to obey the regulations of captain's offices in Belgrade (Serbia), Sremska Mitrovica (Serbia), Slavonski Brod (Croatia) and Sisak (Croatia). The river Sava flows through the territory of the Republic of Croatia from 635 km to 583 km, and this is the navigable course of II category (1,6,8). Thus, maximum tonnage is 650t (6). From 583 km to 507 km the River Sava also flows through the territory of the Republic of Croatia, but the category of the navigable course is III, i. e. maximum tonnage is 1000t (1,6,8). Minimum dimension below the bridges is 5m if the water regime is high on the whole course of the river Sava through Croatia and in the border area between the Republic of Croatia and Bosnia and Herzegovina (4,9). At 207 km the river Sava enters the territory of the Republic of Serbia and from 207 to 174,5 km it represents natural border between the Republic of Serbia and Bosnia and Herzegovina (2). From 207 km to the town of Sabac (103 km), navigable course is

of III category (2). From 103 km to the confluence of the Sava into the Danube at Belgrade (Serbia) its navigable course is that of IV category, maximum tonnage is 1450t (2). Some problems can also occur during the sailing in its course through Serbia. From Sremska Raca (175 km) to Sabac (103 km) shallows can occur if water level regime is low. This makes sailing less safe and this also endangers allowed sailing level of 2,5 m (3). There are more curves with the radius less than 650 m upstream from Sremska Mitrovica, as well as two curves with the radius less than 350 m (minimal value according to the EEC criteria) (3). The river Sava navigable course through the territory of the Republic of Serbia has unfavourable curve which makes navigation more difficult and makes sailing less safe. It also influences sailing economy because at some parts it is possible to sail only in one direction. Two bridges at Sabac and one train bridge at Belgrade don't fulfill sailing conditions if water level regime is high (3). The most favourable water level for sailing is when water gages at Sremska Mitrovica and Sabac show water level of +25 cm and 150 cm (3). Waves can reach maximal height of 0,30 to 0,50 m at the river Sava, and they can cause smaller problems (3). According to the present conditions the category of the river Sava navigable course is that of III, i.e IV category, according to the dimension, to Sabac it is IV category and from Sabac it is III category. The riverbed of the river Sava is not regulated for sailing if water level regime is low. Insufficient depth and shallows occurrence represent the biggest difficulties to the sailing on the river, and they make 11% of the river Sava navigable course, from the border with Croatia to its confluence to the Danube (3). The greatest number of shallows occurs at Raca and Sabac sector which represent the biggest problems to the sailing when water level is low. Bad marking and low maintenance are characteristics of the entire course of the river Sava, navigable course is in bad condition, and safety level is very low. This can be noticed from the data on sailing restrictions during an average hydrological year, that can last for 11 days (2). It isn't invested enough into maintenance and marking of the river Sava navigable course, whereas the criteria for maintenance, marking and financing haven't been set out yet. Thus, optimal usage of sailing and pier capacities on the river Sava is disabled.



Map. Category of the Sava river waterway.

During the nineties of the last century sailing on the river Sava almost entirely stopped, and in February 2003, ship Raska that belonged to Yugoslav river ship company Belgrade transported its load from Romanian pier Konstanca to Brcko district, 13 years after the river traffic had been stopped. This event made the river Sava reopened as an international navigable river. Thus, the Sava has become international river traffic course, which was confirmed with the agreement signed in 2002 between foreign affair ministers of Serbia, Croatia, Bosnia and Herzegovina, and Slovenia. Countries of the west Balkans still have numerous problems concerning their mutual economic and political affairs. In order for the river Sava to become connection between the countries it flows through and attractive destination for navigators, it is necessary for these countries to reach an agreement on mutual projects connected to the revitalization of the navigable course and launching of nautical and touristic projects. In order to realize these plans International Committee for the river basin of the river Sava was founded on 3.12.2002. Its members are Slovenia, Croatia, Bosnia and Herzegovina, Serbia and Montenegro (7). This agreement took effect on 29.12.2004. International Committee was founded in order to try to achieve mutual goals: international

sailing regime on the river Sava and its navigable tributaries, maintaining navigable course, taking measures for preventing danger, as well as removing damage caused by floods, draught and other accidents that could bring dangerous materials into water (5). This agreement also implies cooperation and information exchange between the participants, information on water level regime, sailing regime, regulations, organizational structures, administration and technical support. Cooperation with international organizations is also included (International Committee for the Danube protection ICPDR, Danube Committee, European Economic Committee UN/ECE and European Union institutions). At the latest meeting of the Committee in July 2007. in Zagreb, the Committee brought the decision to create international navigable course of the IV category with the length of 600 km from Belgrade to Slovenia. If this ambitious project was put into practice all members of International Committee for river basin of the river Sava would be connected with the navigable course of the Danube (European corridor 7). Thus, favourable conditions for sailing, tourism and economy development would be created, which would also contribute to better cooperation between the countries of west Balkans.

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