Tourism and Pollution versus Danube Legislation (Example Cazane, Romania Area)

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Abstract: The Danube is the river that runs through ten European countries, with a length of 2875 km, which ranks him second in Europe, being the only one in this part of the world that flows from the west to the east. Tourism development along its length is an important source of income and provides multiple options. The Cazane area is a relatively short portion on the river, located in the lower course of the Danube, very spectacular that also offers tourists unforgettable images.The current legislation supports the development of tourism and protects the river respectively the environment. Unfortunately, there are areas where pollution is present which can jeopardize the tourism activity and destroy the entire habitat. The samplings were taken in the 2011-2013 period by the authors.

Keywords: tourism; pollution; legislation; sustainability

1. Introduction

Considered a wealth of Europe, the Danube starts its journey in Germany, from a spring from the Black Forest, and ends its journey in the Black Sea through a delta, the point of shedding being Sulina. The watercourse length is 2875 km, the catchment of 817,000 km^2, and the average flow of 6500 m3 / s. The countries crossed by the river are Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, Republic of Moldavia and Ukraine.

Table 1. The length of the Danube river by country

Country	Right shore (km)	Left shore (km)
Germany	678,6	687
Austria	357,5	321,5
Slovakia	22,5	172,1
Hungary	471,2	275,2
Croatia	137,5	-

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Serbia	449,9	358
Romania	354,1	1050
Bulgaria	471,6	-
Republic of Moldavia	-	0,6
Ukraine	-	79,6

Source: http://ro.wikipedia.org/wiki/Dunarea

The lower Danube course measured between Baziaş and Sulina stretches around 1075 km and is divided into the following sectors:

- Defileul Carpatic (144 km);
- South-Pontic (566 km);
- pontic oriental with ponds (195 km);
- Pre-Dobrogea (80 km);
- deltaic (90 km).

The most attractive parts are the Gorge and the Delta, due to the landscape and wildlife present there.

2. Tourism in the Cazane Area

In the Gorge, over a length of about 9 km the Danube Cazane stretch, the portion between the mouth of two rivers, namely Plaviseviţa and Ogradena. The width of the river reach, sometimes, just 230 m, which determines the flow rate to exceed 5 m / s. The Cazane are subdivided into two distinct portions, the large Cazane and the small Cazane which are separated by the Dubova gulf. The first have a length of 3.8 km, and range from Ciucarul Mare (in Romania) and Veliki Strbac (in Serbia), and the other ones, The small Cazane have a length of 3,6 km and lies between the Ciucarul Mic (România) and Mali Strbac (Serbia).

These massive heights are low, between 313 m (Ciucaru Mic) and 758 m (Veliki Strbac), but the image created by them is very special. In 1980, the Cazane Mare and Cazane Mici were declared a mixed type nature reservation with a protected area of 215 ha. With the advent of Law nr.5/2000 regarding the approval of the National Spatial Plan - Section III - Protected Areas the Iron Gates Natural Park was established. Subsequently, in accordance with Law no. 5/2000, Order no. 552/2003 of M.A.P.A.M., H. G. No. 2151/2004 and OUG 57/2007, the park was included with 18 reserves, including the Cazanele Mici and Cazanele Mari.

The natural and anthropogenic tourist attractions of the area are:

- The Danube itself and the massive that guards it;
- Gura Ponicovei cavern;
- Veterani grotto;

- Sub-Mediterranean vegetation;
- Rare and protected plants, the Crimean beech, the oriental beech, the hornbeam, mojdreanul, the cazane tulips, the cazane bells, the thorn, the yellow brânduşa, the Turkish hazel, the hawthorn;
- Varied fauna (the mottled horuldi, the rock partridge, the dalmatian turtle, the land turtle, the salamander, scorpion, horned viper, little egret, the dove from the cliff and the sea eagle);
- face of Decebal, dug into the rock, near the Macronia bay;
- Tabula Traiana;
- Mraconia monastery;
- Dubova church;
- The Dubova troiţa.

The traditional manifestations are the measurement of sheep in the sheepfold (the first Saturday in May) and Nedeia (8 September).

In this area there are cottage type accommodation, holiday houses, cottages, guesthouses and villas close to Dubova village in Romanian territory.

Visitors can cross the gorge with cruise ships, barges, motor boats, and those who practice extreme sport with the kayak. In addition to a cruise through the Cazane, tourists can visit the caves (speleology) can stroll in the area (hiking) can ride bikes (cycling), can visit religious goals (religious tourism) they can admire and photograph the scenery, fauna, flora, and can participate in traditional events in the village.

The Danube Cazane is a natural monument that deserves to be visited by tourists and needs to be protected from the effects of pollution.

3. Aspects regarding the Danube Pollution

A current problem that should not be neglected is the pollution that raises technical, financial and health problems. This may be physical, chemical, biological or radioactive and can have a permanent systematic, periodic or accidental manifestation.

Since the early known history, the waters were polluted, only since then the pollution levels have increased logarithmic, and some causes of water pollution are:

- nutrients in agriculture or various types of industrial and household pesticides.
- substances derived from ineffective wastewater treatment.
- radioactive and heavy metals from mining;
- petroleum products from transport ships or shipyards.

There were also cases of accidental pollution:

- foreign barges (Bulgarian) who dumped in 2009 over 11,500 tons of iron ore;
- loading copper ore floated from Moldova Nouă;
- military and civilian ships sinking in the wars that took place in the Danube.

The river water parameters have changed permanently. Here are some values:

- Water temperature is from 18^0 C to 26^0 C with large variations in the middle;
- The pH is 6.5-8.5, the concentration of H ions indicates the water's capacity to reactivate, and the high level of pollution. A low pH allows greater mobility for heavy metals, and an increase of its concentration.
- The dissolved oxygen, which conditions the existence of life in water, is between values from 4.8 to 14.5 mg / l dissolved oxygen. Low oxygen concentration indicates a high concentration of organic substances.
- The alkalinity, the water capacity for reducing acidity, determined by the content of bicarbonate ions, carbonate, and hydroxyl of the water is between 2.3 to 4.5 mmol / l. Waters that have high levels of alkalinity are harmful for ecosystems.
- Conductivity ranges from 278.4 to 503 micros / cm. The dissolved heavy metals in ionic form cause a high conductivity which is a dangerous pollutant that can brew in fish's body to values over 350 times.
- Nutrients that are organic and inorganic components, based on azoth and phosphor, annuls the capacity to clean water. Indicated values were 0,001mg/l and 0,3mg/l for N-NO2, between 1,0 mg/l – 11,2 mg/l for N-NO3 and between 0,4 mg/l and 3,2mg/l for N-NH4
- Mercury is present in substances and products but also stored in a native form. The figures stated were between 0.1 microg / l and 1.0 microg /l.
- Cadmium can be identified with values of 0.5 microg / l to 5.0 microg / l. High values were produced by the hydro plant in Pancevo, immediately after the bombing of the U.S. Air Force.
- Nickel is found in concentrations of 0.5 microg / l and 10.0 microg / l, higher values being recorded at confluences with Drava, Sava and Tisa.
- Lead leads to pollution, with concentrations of 0.1 microg / l to 5.5 microg / l, but there is a downward trend in concentrations;
- The zinc pollutes with concentrations of 0.1 microg / l and 140 microg / l
- Copper pollutes with concentrations of 0.5 mg / l and 30 mg / l, the values are exceeded in the industrial port area from Moldova Noua.
- Arsenic pollutes with concentrations of 0.8 microg / l and 7.5 microg / l.
- Pollution with chromium with concentrations of 0.1 microg / l and 7.8 microg / l.

The standards for chromium are max 2.5 microg / l, for copper 1.3 microg / l,for arsenic 7.2 microg / l, for lead 1.7 microg / l and for nickel 2.1 microg / l. But these elements are found accumulated in the animals' body that consumes fish or water from the river. Finally they can be found in people's body as well.

An important element for terrestrial and aquatic organisms is iron. It is not classified as toxic, but exceeding a few mg / l can make it toxic. In the river waters we found values of 0,5-1,2 mg / l. These values are upstream of the Iron Gates hydroelectric plant but downstream the values decrease almost completely. Hydroelectric power stations besides the industrial utility (electricity production and fluidization of shipping), tourism (recreational and landscape), agricultural (food and water sources for irrigation), also has drawbacks, being a large deposit of sediments, containing all radioactive heavy metals, and nutrient elements transported upstream when the Danube enters Romania. The European Pollutant Emission Register and Transfer E-PRTR have inventoried only large sources of pollution that exceed the maximum limits - CMA. The sediments became large heavy metals deposits - arsenic reached the values of 650 mg / kg - the zinc reached 550mg/kg sediment values - chromium reached the values of 250mg/kg sediment.

In fact almost all heavy metals have high values that exceed the standard. These phenomena cause a change in pH to values of 14.28 (in 2010) of the sediment.

A particular case is the pollution from upstream of the dam, radioactive pollution from two sources. The first such source is the nuclear power plant from PACKS Hungary declaring values of 104-105 Bq/m3 for radioactive gases and 50-60 mBq/m3 radionuclides in river water. Long-lived isotopes that are accidentally removed can reach 104-107 Bq / day. Only that part of the gas, especially Tritium can reach 300-600 Bq/m3 in water and discharge of 1.5 x1010 Bq / day in air. It is relatively true that the phenomenon is felt within a radius of 1-3 km from the hydropower plant. The second source of pollution consists of abandoned uranium mines in the Cazane area; they are neither inventoried nor measured radiometrically. With increasing water levels in the lake many waste dumps and galleries were flooded. Currently, thousands of tons of contaminated water arrive daily into the Danube.

From the performed research elevated cadmium (595mg/kg), lead (320mg/kg), copper (650mg/kg), zinc (6700mg/kg) and manganese (16000mg/kg) were identified.

By swirling the water by ships propellers the pollutant mixture disperses easily in the water.

PET pollution is present and that the action of UV radiation are toxic, besides that provides an ugly image and mess forms on the shores of the Danube, destroying vegetation and fauna of the area.

Noise pollution is directly caused by vessels traveling on the river and indirect resulting from reflections. The reduction of pollution should be a concern of authorities and NGOs.

4. The Legal Regime of the Danube Area

The factors influencing the Danube legislation are multiple. The international law is determined by the fact that this river basin covers a large number of countries with a population of about 250 million inhabitants, which raises a lot of pressures on the environment and waterways and generally the environmental protection issues are not taken into account.

We should not exclude the European integration process from a legal perspective, considering that some bordering countries are members of the European Union (Germany, Austria, Czech Republic, Hungary, Romania and Bulgaria).

The project of creating a unique water course on the Black Sea - Danube-Rhine-Main-North Sea will lead to new legal instruments in international cooperation with respect to the use of the river for navigation, as well as determining the additional problems of cross-border pollution on the Danube.

In developing and managing the legislative framework on the Danube issues we must also consider that all countries pollute the river basin and the effects of pollution are felt by all the states, but the downstream states suffer more intensely because of the pollution phenomenon and from the pollution of the Danube tributaries.

The international legal framework of protection against pollution of the Danube border is now reported in three categories of international norms respectively:

- rules and principles on pollution over borders;
- specific regulations regarding watercourses and international lakes;
- regulation, enacted by coastal States in bilateral and regional cooperation.

In the context of the topic under review, we consider only the Convention for the Protection of the Danube.

Private international conventions referring to watercourses individualize some general strategic- geographic-political-ecological principles.

Thus the Convention in Sofia in 1994 was concluded by the ten Danube countries and the European Community on the protection and conservation of the Danube River. The Convention takes over provisions of other Conventions and contains rules and practical measures of cooperation to prevent and combat cross-border pollution. It establishes the fundamental objectives of cooperation within the

Danube European countries, the basic principles of river protection measures and other things.

Also between these countries there were concluded a series of bilateral legal documents aimed at preventing and combating pollution on the Danube. Thus, there is agreement between Romania and the Republic of Moldavia, in 1991, the Convention between Romania and Bulgaria in 1993, the Agreement between Germany and Romania – 1993, the Convention between Romania and Slovakia – 1998, the Convention between Romania and Yugoslavia relating to the exploitation and maintenance of hydropower and navigation systems in Iron Gates I and Iron Gates II.

The incidence of the provisions of the Community environmental law is also decisive. According to the principles of the Community law, the states member of the European Union have taken over and assimilated in their internal legislation the Community rules, and the aspiring candidates are in the process of harmonization and assimilation of the EU directives. The EU legal regulations are embodied in approx. 20 directives on water and this is an important milestone especially for setting objectives for water quality and water regulation and pollution discharges.

A large number of global protocols, conventions, regional protocols and area protocols, have an impact on the protection of the Danube. Currently there is work being done, in the project Co-Wanda (Convention for the Navigation of the Danube waste management), on developing an international regulation on the management of waste generated by ships, because regulations are clear, binding and have an International regime applied only on the Maritime Danube.

Through the CODENAV project, the Administration Port from Galati, Romania, has acquired ships for clearing pollution, containers and other technologies that takes over garbage, sorted waste, oily wastes and domestic sewage.

Romania, through the national legislation complied with the EU requirements in terms of environmental protection, including the Danube Delta, Danube traffic and others. Thus, the fluencies of the Danube River in Romania were regulated not only the Danube river. The Law nr.17/1990, republished, regulated the legal regime of internal waters, territorial sea and contiguous zone and the exclusive economic zone of Romania.

5. Conclusions

The Danube is the natural way linking Central Europe to the Black Sea, being the second longest river and flow of the continent, after the Volga. The Danube Gorge includes the Cazanele Mari and Cazanele Mici, a known artwork of nature worth visiting by Romanian tourists and from abroad.

The Danube pollution occurs due to diverse human activities and may jeopardize the vegetation, wildlife and even the lives of the people and tourists in the area. Slowing and stopping the pollution concerns European and Romanian authorities and various non-governmental organizations.

The current legislation can be improved, in this regard there are steps being done, wishing the adoption of some rules that would be accepted by all the Danube countries. We must not forget that this river is a source of income from its spring to its mouth, claiming various economic fields.

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