The Danube River Basin

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Introduction

The Danube River is one of the longest rivers in Europe and its watershed is composed of land in 19 countries. It has historically been one of the most important rivers for transportation because it stretches over 1800 miles from west to east. Its source is in the Black Forest of Germany and flows east until it reaches the Black Sea.

The Danube River and its tributaries impact the lives of over 80 million people. It can be broken into 3 main regions: the Upper Danube from Donaueschingen, Germany to Devin Gate at the border of Slovakia and Austria. The Middle Danube stretches from Devin Gate to the Iron Gate Gorge, the boundary between Serbia and Romania. The Lower Danube reaches all the way to the delta region at the Black Sea. The delta region is shared by Ukraine and Romania.

Political Policies and Committees

The Danube River basin is different than many of the other river basins we have looked at because flow allocation is not a major source of conflict in the region. Major issues in the basin revolve around transportation, flood control, and pollution. The management of the river does have challenges including economic differences and rivalries, which can make negotiations difficult.
The Danube Commission was created in 1948 after World War II. It replaced the European Commission which had managed the river since the end of World War I. The commission managed the river including navigation and flood control.

The Danube River Protection Convention (DRPC) was signed in 1994 by 14 countries in the basin that commits them to coordinated water management. The International Commission for the Protection of the Danube River (ICPDR) was founded in 1998 with the goal to ensure the sustainable and equitable use of waters in the basin. It has the power to implement rules set by the DRPC. It has seen success due to its framework composed of representatives of each country and representatives from the private sector. It was awarded the International Thiess Riverprize in 2007 for excellence in water management.

Human Impacts

The region of the Danube River has been occupied by humans dating back to 25000 BC when hunters searched for mammoths. It has played a key role in migration, transportation of goods and militaries, as well as a source of food and water.

Major changes have taken place on the river throughout the years. Attempts to connect the Danube River with the Rhine River date back over one thousand years, when Charlemagne tried but failed. In 1960 construction began on the Rhine-Main-Danube Canal in Germany. It was completed in 1992 and is a major transport route. It links the Black Sea with the North Sea through the Danube and Rhine Rivers. Another canal was built to bypass the Danube delta, called the Danube-Black Sea Canal. Located in Romania, it reduces travel time to reach the Black Sea.

The Danube River is also used as a source of energy. A total of about 600 dams and have been built on the river and its tributaries, with 69 of those built in the main Danube channel. The two largest dams are the Iron Gate dams I and II, completed in 1972 and 1984 respectively. They form part of the border between Serbia and Romania and include two hydroelectric power plants. The countries of Slovakia (Czechoslovakia) and Hungary agreed to jointly construct a series of dams called the Gabčíkovo – Nagymaros Dams in 1977. It was initiated by the Budapest Treaty, and intended to prevent floods, produce electricity, and improve sailing. Hungary abandoned construction before their dams were completed, causing strain on their relationship with Slovakia.

The Danube delta was broken into numerous smaller lakes that no are no longer interconnected between 1960 and 1990 by Romania. This was done to allow for agriculture, forestry and fish culture. Many reservoirs have also been created in the region to store water for irrigation.

Environmental Quality & Climate Change

Each region of the Danube River has a distinct characteristics and ecology. The Upper Danube is characterized as a mountain stream, with low water temperature and higher velocities. It has mild winters and high precipitation. The Middle Danube begins to slow down and spread out. The Lower Danube consists of wide floodplains and even slower velocities. The Middle and Lower Danube have lower precipitation and cold, dry winters. The Delta region has a rich ecosystem and covers over 5,500 km². It has very low precipitation, <350 mm, compared to other parts of the region.

The environment has been greatly affected by changes in the region. The water quality has steadily declined due to several factors. Industrialization in the area during 1950 to 1970 led to dumping of toxic waste into the river. This has been reduced in the Upper Danube with the increase in wastewater treatment plants. The Middle and Lower Danube are still plagued by poor water quality due to high pollution inputs from tributaries, poor pollution control and industrial inputs. Agricultural runoff is also a source of pollution. The dams have reduced the sediment and suspended solids carried down the river, which has affected the Delta. High nutrient loads in the river have led to eutrophication.
The importance placed on transportation on the river has also had dramatic impacts. The dams have reduced spawning grounds for native fish species. Only two of the dams have fish migration facilities. Sturgeon was an important fish species for the region, and today 5 of the 6 species are critically threatened by extinction due to over fishing and loss of habitat. Many of the flood plains have been drained and dikes have been constructed to allow for more land for agriculture, reducing even further spawning grounds. The Rhine-Main-Danube Canal has led to invasive species which is also hurting the ecology.

Climate change is a major issue for the region. It is expected that the region will experience more frequent flooding, longer periods of drought, and an increase in water temperature. Over the past century, Europe has experienced an increase in temperatures of approximately 1°C, which is expected to continue. The precipitation in the region is also expected to shift. In northern Europe, the precipitation is predicted to increase 10 to 40 percent, while in central Europe the precipitation is expected to decrease by up to 20 percent. These changes will affect the water quality, and could harm the native species of fish and animals if they cannot adapt. The WWF (World Wildlife Fund) has made several recommendations on coping with climate change. They are: work with nature, not against it; find the right balance between use and protection and support innovative technology; turn agriculture from problem driver to solution facilitator; and integrate European policy and ensure wise use of EU funds.

Assigned Reading:

“Danube River” Transboundary Water Challenges: Case Studies, D. C. McKinney, University of Texas at Austin, 2008