Prut River Basin

KEY WATER ISSUES

The project is funded by the European Union

This project is implemented by a consortium led by Hulla & Co. Human Dynamics KG
The Environmental Protection of International River Basins (EPIRB) project aims to improve the quality of water in transboundary river basins in the wider Black Sea region, including Ukraine and the Republic of Moldova. One of the specific objectives is to improve technical capacities by developing river basin management plans (RBMPs) in selected pilot river basins, according to the requirements of the EU Water Framework Directive (WFD). One of the selected pilot basins is the Prut River basin, which begins in western Ukraine and extends along the border between Romania and Moldova.
The Water Framework Directive and river basin management plans

One of the requirements of the WFD is the achievement and preservation of good water status by managing waters in natural units — that is, in river basins.

River basin planning follows a structured approach: finding out facts, deciding on necessary actions, making a management plan, and putting the plan into practice. An important first step is to identify significant water management issues so that appropriate solutions and measures can be developed.

The impacts of human activities

Human activities can lead to serious problems in terms of both water quality and quantity. The most common water-related problems are pollution and the effects of physical modifications to rivers and lakes.

Water pollution can arise from two types of sources: point sources, such as discharges from industrial facilities and wastewater treatment plants; and diffuse sources such as land-use activities, including agriculture and tourist facilities.

Hydromorphological alterations include the physical modification of waterways, such as engineered modifications to the natural structure or flow of rivers in order to make particular use of them. Such modifications might include land drainage, the construction of flood defences, or the damming of rivers to provide storage for power generation or facilities for fish breeding.

Another potential problem is excessive water abstraction, which can reduce river flow and even cause rivers and lakes to dry up.

Good water status

is achieved when pollution is controlled and there is sufficient flow for ecosystems to function and survive.

A river basin is the land that water flows across or under on its way to a river. The basin sends all the water that falls within it to a central river or estuary.
PRUT RIVER BASIN – Profile

TOTAL AREA
27,540 km²

LOCATION
9,350.012 km² in western Ukraine; 8,123.35 km² in Moldova

CHARACTERISTICS
Five national parks, several nature reserves, one major wetland and several Ramsar-listed lakes along the lower Prut.

WATER USE
In Ukraine, 48.92 million m³ of water were abstracted in 2011. Groundwater was used for household/drinking water supply (51.3%), agriculture (42.9%), industry (5.7%) and commercial bottling (0.1%). In Moldova, an average of 21% of consumed water is used for municipal purposes. Around 3 million m³ of water from the basin, or 17.6% of total water consumption, are used for irrigation.

DID YOU KNOW?
The Prut rises in the south-western slopes of Mount Goverla, in the Chemogory massif, and flows into the Danube.
Most of the waste that ends up in rivers has been disposed of on land. Buying reusable products and avoiding excess packaging can help reduce the amount of waste produced and thus protect rivers from pollution.

POLLUTION FROM SOLID WASTE DISPOSAL

What’s causing the problem?
In the Prut River basin, in Chernivtsi region in Ukraine, there are 11 municipal solid waste landfills with a total area of 67 ha, eight of which exceed their intended capacity. In 2011, the region generated over 225,000 tonnes of waste, 160,000 tonnes of which were generated by the city of Chernivtsi.

In the Prut basin in the Republic of Moldova there are 742 landfills for the disposal of solid domestic waste, covering an area of 529 ha, and seven storage facilities for obsolete pesticides and chemical fertilisers. There are many unauthorised landfills and dumpsites for solid industrial and domestic waste, and a vast amount of mining waste, particularly in the north of the basin. There is a shortage of modern treatment facilities, although 15 new landfills were constructed in 2011 in Briceni, Nisporeni, Ungheni and Cahul districts.

How does it affect water status?
The drastic increase in the production of solid waste and the lack of adequately equipped landfills lead to the leaching of extremely hazardous toxic and carcinogenic chemicals and biological pollutants into groundwater and surface water bodies.

Leachates, especially from unauthorised landfill sites, penetrate the groundwater, resurface via springs and then enter the Prut River.
Water pollution is the contamination of surface waters and groundwater with harmful substances, causing a degradation in water quality.

POLLUTION FROM PARTIALLY TREATED OR UNTREATED WASTEWATER

What’s causing the problem?

The wastewater treatment plants in the Prut basin in Ukraine were built between 50 and 60 years ago and were not designed to remove modern pollutants. Their equipment is outdated and their expected lifetime long over. Most of the industrial enterprises in the basin are so-called secondary water consumers, meaning that their wastewater is transported for treatment to municipal facilities, where it is typically not appropriately treated. In addition, sewage collection systems are inadequate in small towns and rural areas. In 2011, the level of coverage in settlements in Ivano-Frankivsk region (4 percent) was among the lowest in Ukraine, and coverage is also low in Chernivtsi (6.2 percent).

In settlements that are without a sewerage system, or only partly canalised, wastewater is collected in decentralised sanitation systems such as septic tanks or pit latrines.

In Moldova, wastewater treatment facilities often fail to respect environmental standards, including pollution prevention and control. The lack of sewerage networks and treatment plants in most settlements is a serious problem. Most biological wastewater treatment plants require reconstruction and technological modernisation, especially in Cahul district and in Cornesti and Valea Mare in Ungheni district. The quality of discharged wastewater has decreased significantly due to the outdated equipment and inadequate capacity of treatment plants. Despite a reduction in the volume of insufficiently treated water the average remains high, at an annual 1.5 million m³ over the past four years.
How does it affect water status?

Each year, a substantial volume of wastewater is discharged into septic tanks or in an uncontrolled way, contaminating wells and surface water bodies. Untreated wastewater increases the content of phosphorus, nitrogen and organic compounds in the water body, changing the composition and condition of fresh water due to the explosive growth of algae and plants in a process known as eutrophication. Oxygen is used up as the dead algae decompose, reducing the amount of dissolved oxygen in the water and altering the survival, reproductive and competitive capacities of water organisms. The rapid growth of algae, known as algal bloom, can be harmful to fish and other aquatic animals, as it creates toxins. Even non-toxic algal blooms can affect aquatic life by blocking out sunlight and creating areas with little or no oxygen.

Wastewater treatment is the removal of contaminants from wastewater to produce both a liquid suitable for disposal into the natural environment, and sludge. Biological methods may include aerated lagoons and sand filters. The simplest method is to separate solids from liquids by sedimentation.
POLLUTION FROM AGRICULTURAL ACTIVITIES

What’s causing the problem?

Sources of agricultural pollution (fertilisers, livestock breeding and the excessive grazing of pastures) are known as diffuse, or non-point, sources.

In the Prut River basin on the territory of Ukraine the total volume of mineral fertilisers applied in Chernivtsi region in 2011 was 10,730 tonnes, with an average of 88 kg per hectare of crops. Only a small volume of fertilisers is used in mountainous areas (30 to 40 kg/ha), and a considerably bigger volume in the plains. The average figure in Khotyn district is 128 kg/ha. There are limited data available regarding organic fertilisers, although the average amount is 500 kg/ha.

Agriculture is a traditional economic sector in the Republic of Moldova, and the Prut River basin is a typical agricultural region, with agricultural land occupying 76.8 percent of the basin. Over 52 percent of the basin is covered by arable land, used for growing grains and crops for feedstock. There has been a dramatic slump in animal farming in recent years due to the absence of subsidies and frequent droughts. Numbers of pigs and poultry do not differ greatly by region, but there tend to be more sheep and goats towards the south and more cattle in the north, according to the extent and quality of natural pastures.

Manure can be a valuable resource rather than just a waste product, but it must be managed appropriately to protect surface waters and groundwater.
How does it affect water status?

Applying fertilisers affects the quality of groundwater and surface waters. Mineral and organic fertilisers and pesticides are washed from fields and livestock farms into streams and rivers, causing organic and nutrient pollution. A rise in the level of nutrients (nitrogen and phosphorus) causes algae to grow faster, increasing biological oxygen demand. This has a negative impact on water quality and fish breeding. In Moldova, agricultural land is an insignificant source of water pollution due to the small volume of chemical fertilisers used in agriculture, with the exception of the north, where it can exceed 90 kg/ha.

Fertilise wisely!
Applying fertilisers in appropriate quantities, at the right time of the year and using the right methods, can reduce the potential for pollution.
What’s causing the problem?

Hydromorphological changes in the Prut basin in Ukraine are mainly due to flood protection engineering, gravel abstraction and the derivation systems of small hydropower plants (HPPs). Most small HPPs in the Carpathians are designed to operate on the upper reaches of rivers where slopes are steepest and the falling waters provide maximum energy. However, river flow discharges are low, thus to maximise power generation large volumes of water are diverted (“derived”) each year from riverbeds to HPPs. Flood protection measures in the basin include improvements in monitoring, damming, straightening river courses and strengthening riverbanks. In mountainous areas a popular bank strengthening measure is to build retaining walls. At the beginning of 2012, a total of 202.3 km were regulated in Ivano-Frankivsk region and 123.4 km in Chernivtsi region.

In the Prut basin in Moldova there is a single 32,000 kW HPP in operation. Commissioned in 1979 jointly with Romania, it is located near Costesti and Stinca, 576 km from the Prut headwaters. The main task of the hydrotechnical complex is to regulate the flow of the Prut River so that 34 residential areas located downstream, with over 100,000 inhabitants, are protected against floods. Flood protection embankments along the Prut have been constructed and reconstructed since the mid-1900s, particularly after the historic flood in 1969.
How does it affect water status?

Engineering infrastructure disrupts aquatic ecosystems, river flow and the migration of aquatic organisms. The straightening of riverbeds leads to morphological alterations and, consequently, to changes in ecosystems. In Ukraine, diversion work often involves the entire volume of water in a river, leaving the riverbed dry. Water derivation leads to serious problems: habitats are destroyed, fish fail to reproduce and aquatic organisms disappear. It also leads to socioeconomic problems, such as a decline in tourism potential.

In Moldova, the impacts of embankment construction have been both positive, in terms of flood protection; and negative, by increasing the velocity of river flow. The main dams are in lowland areas in the middle and lower parts of the basin (Cahul, Cantemir, Leova and Hincesti).

The natural migration routes of fish and their access to habitats are often obstructed by the building of dams. The incorporation of fish migration aids in cross-river structures helps keep habitats accessible, protecting natural reproduction patterns and lifecycles and ensuring population sustainability.
The European Union is the world's largest donor of official development assistance. The European Commission's Directorate-General for European Neighbourhood Policy and Enlargement Negotiations (DG NEAR) manages the majority of the Union's financial and technical assistance to the neighbourhood and enlargement countries. By implementing assistance actions in Europe's eastern and southern neighbourhood, DG NEAR supports reform and democratic consolidation, and strengthens prosperity, stability and security around Europe. DG NEAR helps to promote EU values, policies and interests in this region, and contributes to developing the special relationship of the EU with its neighbouring countries.

Legal notice: This publication has been produced with the assistance of the European Union. The views expressed in this publication are the sole responsibility of the Human Dynamics Consortium implementing the project and can in no way be taken to reflect the views of the European Union.

© 2015 – Regional Environmental Center for Central and Eastern Europe