STATUS AND IMPACT

The basins of transboundary rivers and lakes are widely heterogeneous from the social, economic and environmental points of view and display specific problems related to both water quantity and water quality. Nevertheless, some issues are common to most of the basins.

In many basins/sub-basins, the ecological and chemical status of transboundary rivers and lakes is under threat from a range of human activities leading to organic pollution (mostly from sewage), nutrient pollution (mostly from agriculture and sewage), pollution by hazardous substances (mostly from manufacturing and mining), and – in the case of rivers – hydromorphological alterations, mostly due to water construction works for hydropower production and navigation.

Although the relative importance of chemical and microbiological pollution varies greatly within the region, the contamination of drinking-water supplies is significant in EECCA and SEE, and water-related diseases such as cholera, dysentery, coliform infections, viral hepatitis A and typhoid are often reported.

The assessment showed that almost 20 per cent of transboundary rivers in Caucasus and Central Asia are in a “high or good chemical status”; this also applies to some transboundary tributaries to first-order rivers in Eastern Europe and SEE. Some of these water bodies, however, show signs of increasing pollution due to the ongoing revival of industry and agricultural production or are potentially threatened by mining and ore processing. The majority of the transboundary rivers included in the assessment fall into the category of “water bodies with moderate pollution”. “Polluted water bodies” in EECCA and SEE basins are transboundary rivers which: (a) take up their pollution load in lowland

areas due to intensive agriculture; (b) are in the vicinity of big cities and industrial centres; (c) have small water discharges; and (d) which take up their pollution load in foothills with intensive industrial (including mining) or agricultural water use. Cadmium, lead, mercury, phenols and oil products, as well as pesticides, are among the most serious pollutants.

Similarly, a number of transboundary rivers in Western Europe as well as Central Europe are in high and good status. Most rivers still belong to the category of "moderately polluted" water bodies or have a "fair water quality". There are also transboundary rivers or stretches of these rivers, for example in the Danube basin, that have been assessed as "polluted". Cadmium, lead, mercury, nickel and its compounds, tributyl-tin, hexachlorobenzene (HCB), dichloro-diphenyl-trichloroethane (DDT), lindane and atrazine are among the most serious pollutants.

Eutrophication is the worst phenomenon affecting transboundary lakes. It is increasing constantly except in areas where wastewater treatment has been effectively implemented and where small improvements are visible. In nearly all areas, increasing non-point loading from agricultural and forestry areas has spurred incipient eutrophication even in some lakes, which were earlier in good condition. High nitrate-nitrogen concentrations, particularly from fertilizers, are also a problem in groundwater (see separate groundwater assessment in Part 3). Insufficiently treated wastewaters from municipal treatment plants and return waters from irrigated agriculture also cause eutrophication in rivers (phosphorus compounds) and the sea (nitrogen compounds, sometimes phosphorus).

Geochemical processes have been repeatedly seen as an issue of concern in some river basins in the entire region due to high natural background concentration of heavy metals (mountain areas) or high turbidity (areas with peat extraction). Geochemical processes also cause high arsenic concentrations in some aquifers in SEE countries.

Deforestation, soil erosion and degradation of pastures (particularly in EECCA) are additional issues of concern. They will continue to be a problem for the proper functioning of water-related ecosystems and lead to higher risks of natural disasters as the implementation of response measures (e.g. afforestation) will take some time.

The effects of climate change are becoming visible in almost all of the analysed river basins. Most basins experience an impact of climate change on water quantity (e.g. decreasing water resources availability and extreme hydrological events, including severe floods and long-lasting droughts). With a reduction in precipitation of up to 30% over the last decade, water resources availability, for example, is decreasing in river basins in the discharge area of Mediterranean Sea. The effects of climate change on the ecological regime of rivers are also becoming visible in transboundary basins in Central Asia, where the rise in air temperatures leads to significant melting of glaciers, resulting in noteworthy changes of the rivers' hydrological and ecological regimes. Thus, climate change adaptation measures in water management and water-depended activities and services (e.g. agriculture, forestry, water supply, hydropower generation) are needed in the entire UNECE region.

Damage by floods became a costly water-quantity problem in the entire region. Too many countries still base flood prevention and mitigation solely on structural measures, such as the construction of dams and dykes and improved operations of dams and reservoirs. Holistic approaches to the prevention and mitigation of floods, applied particularly in basins in Central Europe, should be implemented more widely. These holistic approaches combine non-structural measures (e.g. giving more space to the river) with structural measures. There are also basins that suffer from the consequence of "man-made" floods, an example being basins in Central Asia where high water releases from reservoirs in wintertime for hydropower generation lead to downstream flooding.

Water sharing among countries in the same basins to satisfy demands of national economic activities (irrigation, manufacturing, energy production), continues to cause upstream-downstream conflicts, including adverse effects on the environment (e.g. the destruction of water-related ecosystems). Most affected are the basins in Central Asia (e.g. Amu Darya, Syr Darya, Ili) and the Samur basin.