ENVIRONMENTAL MONITORING

SPECIFIC MONITORING ACTIVITIES[1]

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UNECE Working Group on Environmental Monitoring and Assessment
Environmental Monitoring and Assessment: Eastern Europe, the Caucasus and Central Asia

The reporting process for the third pan-European environmental assessment report (Kiev Assessment) identified important gaps across specific monitoring areas in the countries of Eastern Europe, Caucasus and Central Asia (EECCA). This section summarizes these gaps. The CD-ROM contains additional materials, including case studies and recommendations on transboundary air pollution monitoring and waste monitoring.

The biggest gaps in data availability across the EECCA subregion are related to urban air pollution, soil contamination, soil remediation, waste management systems including hazardous waste, water quality, waste-water treatment and discharge to water and hazardous substances. In contrast, coverage was relatively good for soil erosion, land cover, and water quantity and use (EEA, 2003c).

Box 1. Urban air pollution monitoring in Central Asia

Other Central Asian countries have been able to maintain more elements of their air-monitoring network. In Uzbekistan, for example, 69 stations operate in 25 cities. However, some key stations in these countries have been closed: Tursunzad, in Turkmenistan, for example, has lost three stations that track air pollution from the nearby Tajik Aluminium Plant. In addition, sampling has been reduced at many monitoring stations that continue to operate
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Environmental monitoring systems across Central Asian countries have declined severely over the past decade, owing in particular to insufficient funding. The situation varies significantly, however. The problems are the most obvious in Tajikistan, where the number of fixed ambient air pollution stations declined from 21 to 3. In Kyrgyzstan, only a dozen stations continue to operate in four cities.

Source: Regional Environmental Centre for Central Asia (RECCA, 2002).

Monitoring coverage and data availability for *urban air quality* are poor in some countries. This is a concern in particular as air pollution in relation to human health is a serious problem in EECCA cities (box 1 provides an overview of air pollution monitoring in Central Asia). Other areas, in particular *transboundary air pollution monitoring*, need to be strengthened across the region. Transboundary issues are described in the case study on Monitoring transboundary air pollution and the case study on Air pollution inventories, monitoring and modeling in Kazakhstan, both in this CD-ROM. Recommendations to EECCA, new CLRTAP Parties on strengthening air pollution inventories, monitoring and modelling, addressing these problems, are also included.

For soil and land use, monitoring related to *soil contamination* is another important gap. Although more data on the number of contaminated sites have gradually become available, their analysis is hampered by a lack of comparability and information on progress in and costs of remediation. In contrast, information on the extension of the area affected by *soil erosion*, especially the area of agricultural land affected by erosion, is available (most countries have data for the past 10 years). However, not all countries have data on the amount of soil lost by erosion; moreover, units measured are not homogenous, making comparisons difficult. The most complete data sets concern *land use,* with time series covering the past 10 years.

Although data on the generation and management of *solid waste* – both total levels and for key categories – are generally accessible, data quality is not good enough for analysis in all countries. In several countries, *hazardous waste* data are also unreliable because of inaccurate inventories and different classification systems. Quantitative and qualitative data on the generation, use, disposal and environmental effects of *industrial waste* are not reliable in a number of countries

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(UNECE, 2000d). Industrial waste and chemicals monitoring in Armenia is described in box 2. Further information is found in the case study on Waste classifications and inventories in the Caucasus, contained in this CD-ROM.

Box 2. Chemicals and industrial waste monitoring in Armenia

Since 1988, a severe earthquake, economic difficulties in the transition and war have all significantly reduced industrial production as well as the monitoring of industrial waste and hazardous chemicals. Industrial production started to recover in the late 1990s. While industrial waste statistics are collected from enterprises, overall these are not very reliable. Armenia does not have an inventory of contaminated sites and land, although land contamination is reportedly a widespread problem at heavy industries. Before 1990, about 5000 different chemicals were produced, exported, imported or used in Armenia. Today, however, there is no systematic information on hazardous chemicals stored at active and closed plants and other locations. New laws and programmes have been prepared to improve waste and chemicals management, including monitoring.

Source: UNECE, 2002a.

An overview of waste monitoring in three Central Asian countries is presented in box 3. To address issues related to waste monitoring, General recommendations on the improvement of waste classification and inventory systems, included in this CD-ROM, were prepared.

There is a general lack of environmental monitoring and comparable data and information on *water quality* in EECCA (across rivers, lakes, groundwater and coastal waters). National surface-water monitoring systems are not coherent, as neither the data reporting systems nor the methodologies are harmonized. One issue affecting many countries is that tasks and mandates of various ministries and agencies involved in monitoring water quality and quantity are not well defined, leading to overlapping efforts and lack of coordination. In Ukraine, seven national bodies – ministries and State committees – had a role in different aspects of water monitoring in the late 1990s (UNECE, 1999). In Uzbekistan eight major agencies are involved, together with an extensive network of their subordinate departments and other local entities (RECCA, 2002). The lack of coordination can reduce the effectiveness of environmental policy instruments, contributing to low collection rates for water use and water pollution charges and penalties.

In most EECCA countries, monitoring systems for *biodiversity* are cumbersome and expensive to manage (UNECE, 2000d). This is a problem also for shared ecosystems, such as marine and coastal areas of the Caspian Sea (UNECE, 2000b). In some cases, biodiversity monitoring has largely ceased, for financial reasons. This is the case in Uzbekistan, whose wetlands are of global and regional importance (UNECE, 2001), and in Armenia, whose Red Data Books are based on data from the 1970s and early 1980s (UNECE, 2002a).

Beyond specific environmental issues, the environmental impacts of *major economic sectors* such as transport, energy and agriculture are poorly monitored. In many countries, emission data on polluting enterprises are lacking, and environmental performance reporting (including data on environmental expenditures) by companies is only just starting. Moreover, the emission data available in some EECCA countries give only a rough idea of the role of transport in air pollution (often, the share of pollutants such as carbon monoxide and lead emissions that originate from transport is not estimated). (UNECE, 2000d).

Sampling and measurement of *industrial sources* are often uncertain, even in countries that have largely maintained their monitoring systems (box 4 describes the situation in Ukraine). In

countries facing severe funding problems, this monitoring has been significantly curtailed. In Kyrgyzstan, for example, only two of the Ministry of Environmental Protection's six regional offices regularly carry out emissions sampling (UNECE, 2002c). Self-monitoring by industry poses a problem of information reliability on several levels, including the often poor condition of measuring equipment used. In Uzbekistan, highly polluting facilities, such as oil and gas processing plants and coal-fired power plants, lack efficient monitoring equipment (UNECE, 2001). Weak monitoring of compliance with permits discourages their strict application by industry in many cases.

Box 3. Waste monitoring in Central Asia

The Kazakh National Statistics Agency has considerably improved its reporting system for industrial waste generation, including hazardous waste, over the past 10 years. In contrast, data on municipal waste generation are poor and in some cases unreliable. Kazakhstan does not have an inventory of contaminated sites. Data on hazardous wastes stored at industrial areas are also incomplete.

In Kyrgyzstan, the National Statistics Committee has collected data on hazardous industrial waste from enterprises via questionnaires since 1994. However, the accuracy of responses is not verified. Mining industry, in particular for uranium, has been a major sector in Kyrgyzstan – one specific concern is the need to improve monitoring of mine tailings for soil and water contamination and other threats. Unmonitored mine tailings are a potential concern in other Central Asian countries as well.

In Uzbekistan, data on solid waste generation and disposal are fragmentary and conflicting. Among the areas that require attention is hazardous medical waste, a potential health risk. Its transport and disposal are not tracked.

Source: UNECE, 2000b, 2000c and 2001.

Box 4. Monitoring industrial air pollution in Ukraine

In the late 1990s, Ukraine had over 2,500 inspectors who checked emissions at major polluting facilities. Random inspections were also made. Samples were analysed at 49 inspectorate laboratories across the country. Overall, however, equipment was ageing and the inspectorate was not able to ensure regular and complete control of major polluters. Moreover, most industries had little capital investment: factories typically were poorly equipped with pollution measuring devices. Samples were taken only occasionally – there was no equipment for continuous emissions measurement. These were important concerns, as factory pollution control equipment had been ageing and emissions in some cases rising. Air emissions were and continue to be calculated based largely on production processes, energy consumption and mass balances.

Source: UNECE, 1999.

One further problem, seen across different monitoring activities, is that many EECCA countries lack national guidelines to ensure uniform sampling, measurement and analytical work. Moreover, in many countries there is no system in place for accrediting laboratories that analyse samples (UNECE, 2000d).

Issues affecting monitoring are addressed in the Recommendations on strengthening national environmental monitoring and information systems in countries of Eastern Europe, the Caucasus and Central Asia, found in this CD-ROM.