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WATER AND SANITATION IN THE UNECE REGION: ACHIEVEMENTS IN WATER PROTECTION AND WATER SUPPLY SINCE RIO, TRENDS AND CHALLENGES*

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I. PROGRESS AND CHALLENGES IN WATER PROTECTION AND WATER SUPPLY

A. Protection of water resources, water quality and aquatic ecosystems

1. The 1990s saw a move towards a more integrated approach to water management. This trend included: (a) water-quantity and quality management at watershed or river basin level; (b) greater consideration of interactions between urban and rural activities and water quality; and (c) greater recognition of the fact that water bodies should be able to support aquatic life and meet human health and recreation criteria. .

* For technical reasons, figures and literature references are contained in ECE/AC.25/2004/5/Add.2.

2. Modern water management needs to take account of ecological, economic and social functions throughout the entire basin. Thus, there is renewed interest in river basin management and other "place-based" approaches. Some countries (e.g. France and Spain) have long had river basin agencies, and many others are now creating them. Some countries, while not making the river basin approach a fundamental institutional feature, are improving integration by creating ad hoc entities for the protection of specific water bodies, in which all stakeholders are represented.

The development of integrated water management implies that most countries will be obliged to make considerable investments. Having drawn up national action plans, they must develop investment programmes with clear targets and a budget to protect aquatic ecosystems, act against floods, improve water quality and complete or upgrade their water infrastructure.

3. Although there has been significant progress in the management of water resources and quality across Europe, problems still persist. Total fresh water abstractions fell during the past decade in most UNECE subregions (see fig. I).

4. However, 31% of Europe's population lives in countries that experience high water stress, particularly during droughts and periods of low river flow. Overexploitation of water, especially increasing use of groundwater for public water supply, and, to a lesser extent (except the countries in Central Asia), overuse of surface water for irrigation, have had serious consequences, such as the drying-up of spring-fed rivers, the destruction of natural wetlands in Western, Southern and Eastern Europe and North America, salt-water intrusion in aquifers, for instance, along the Mediterranean coast and the Aral Sea, and the extinction of the Aral Sea is aquatic environment.

5. There are, however, examples of water resources that have recovered once overexploitation ceased. In Latvia, for example, intensive and unbalanced use of groundwater had caused large underground depression fields in the Liepaja and Riga aquifers, but a decrease in water consumption during the 1990s, resulting from the implementation of water consumption accounting and economic instruments, has led to a gradual rise in the water level (see fig. II).

6. In Western Europe and the EU accession countries, river, lake and coastal water quality is generally improving in terms of phosphorus and organic matter. This reflects a decrease of these substances in discharges, which mainly results from improved waste-water treatment. Nitrate levels have remained relatively constant; but they are significantly lower in accession countries reflecting less intensive agricultural production than in the European Union. Concentrations of nutrients are much higher than natural or background levels. Eutrophication, as indicated by high phytoplankton levels in coastal areas, is highest near river mouths or big cities. Heavy metal concentrations in rivers in Western Europe, and their direct discharges and atmospheric deposition into the North East Atlantic Ocean and the Baltic Sea, have all fallen as a result of emission reduction policies.

7. Information on the state of waters in EECCA shows that many rivers, lakes, groundwaters and coastal waters are polluted, often with hazardous substances including heavy metals and oil. The pollution tends to be concentrated in localized hot spots downstream of cities, industrialized and agricultural areas and mining regions. Away from these hot spots, river

and lake water quality appears to be relatively good. However, industrial accidents, even of a limited scope, remain a threat to these waters.

8. Oil pollution caused by discharges from coastal refineries and offshore installations is decreasing in Western Europe. However, illegal discharges, mainly from ships, are still a problem, especially in the North Sea and Baltic Sea. Oil pollution in general, from several sources, is a major problem in the Black Sea, the Caspian Sea and the Mediterranean.

9. In the past few decades, West European countries have made huge efforts to clean up effluent discharges, and protect and restore water resources. Good progress has been made, although the diversity among countries with respect to economic and social development, institutional structures and culture has led to considerable differences in the environmental results achieved to date.

10. On the basis of the Environmental Performance Reviews conducted by the Organisation for Economic Co-operation and Development (OECD) and UNECE, it is clear that all countries in Western Europe have achieved notable success in at least some of the following areas, whereas these areas remain a challenge, particularly for Eastern Europe, the Caucasus and Central Asia (EECCA):

- Large reductions in point discharges from industry and urban areas;
- Clean-up of the worst polluted waters;
- Establishment of a comprehensive framework of water management laws, policies, programmes and institutions;
- A good degree of integration of quantity and quality management;
- Progress towards the whole-basin approach;
- Wider implementation of integrated permitting;
- Improvement in the enforcement of regulations and permit conditions.

11. The past decade has also seen increasing recognition that the management of fresh water and the coastal zone should be linked, acknowledging that the cause-effect relationships in terms of pollution, flooding, salt intrusion and other management issues do cross coast lines. A number of initiatives have been launched to address these interlinkages (see box 1).

Box 1. Integration of river basin and coastal zone management

The Oder catchment forms an interesting international case for a freshwater-coast project because of a number of features:

- There is close interaction between the river basin and the coastal area;
- The interests of stakeholders in the project area are substantial;

- The Oder river forms an international basin of medium size with existing international cooperation on the river basin and coastal zone;
- The region is experienced in integrated coastal zone management (ICZM) as in the past substantial ICZM activities/projects have taken place and lessons have been learned for the Szczecinski Lagoon (Baltic pilot area, strategic plan, guidelines);
- The project is politically relevant, as the implementation of the EU Water Framework Directive is on the agenda;
- Germany and Poland have the political will and good contacts with management organizations and appropriate research institutions for the implementation of a pilot project.

Source: /27/

12. During the 1990s, EECCA countries have made significant efforts in environmental management and are continuing to doing so. They have adopted basic environmental legislation and introduced new environmental policies, generally based on a combination of legal and regulatory instruments (e.g. standards, norms, environmental impact assessment, permits for water abstraction and discharge) and economic instruments (e.g. charges for water use and pollution discharge, fines).

13. Nevertheless, economic and social difficulties in the transition to a market economy mean that the efforts have not always born fruit. They also explain why environmental issues are not among the top priorities in these countries today.

14. It was an advantage that the Russian Federation kept the system of water management, based on the river-basin approach, that had been developed in the Soviet era. Many other countries have also recognised the advantages of the river-basin approach for water management and, after testing it on particular national and transboundary basins (for instance, the Dnieper basin), are now considering using it more widely. The approach has proven to be useful not only for pollution control, but also to optimize the collection and use of funds.

15. Several measures for water conservation have been adopted. Economic instruments, mainly based on the polluter-pays and user-pays principles have been introduced (abstraction charges, permits, increased water charges and taxes). More could be done to change consumer attitudes, especially by introducing metering, which has proven to be a very efficient tool to reduce water use.

According to the national assessment reports on the implementation of Agenda 21, prepared by countries for the World Summit on Sustainable Development (WSSD), between one third and two thirds of the UNECE countries have implemented the measures on groundwater pollution prevention, water purification treatment and water conservation as laid down in Agenda 21.

15-20% of UNECE countries have made progress on these measures. According to these reports, the performance does not differ significantly between subregions.

16. Despite the progress made, the considerable water management efforts of recent decades have not been enough to safeguard and restore water quality and aquatic ecosystems. Much remains to be done on a number of issues, such as:

- Achievement of ambient water-quality objectives;
- Better protection of aquatic ecosystems;
- Reduction of subsidies which increase water problems (e.g. over-abstraction, pollution);
- More consistent application of the polluter-pays principle and the user-pays principle;
- Implementation of the laws, regulations and policies that have been adopted;
- Control of diffuse sources and deposition of nutrients, heavy metals and persistent organic pollutants;
- Reduction of groundwater pollution by nitrates, pesticides and other persistent chemicals;
- Completion, restoration and upgrading of the waste-water treatment infrastructure;
- Better integration of water management into sectoral and land-use policies.

B. Structural and non-structural measures related to drinking-water supply and sanitation

17. Agenda 21 called for access to safe water in sufficient quantities and proper sanitation for all. The Johannesbourg Plan of Implementation called for the proportion of people without access to safe drinking water and sanitation facilities to be halved by 2015.

18. Drinking-water quality is still of concern throughout the UNECE region, with significant microbiological contamination of drinking-water supplies in EECCA, contamination by salts in Central Europe and the potential exposure of more than 10% of European Union citizens to microbiological and other contaminants that exceed the maximum allowable concentrations. Problems are generally highest near pollution “hot spots” as a result of a range of industrial and other activities.

19. The situation is generally of greatest concern in some EECCA countries, especially the quality of drinking water in terms of microbiology and toxic substances. This reflects the still relatively poor economic conditions in this region and, in several countries, the deterioration or lack of infrastructure for providing clean drinking water. The health of humans and ecosystems is also threatened in other parts of Europe. One example is water contaminated by organic and inorganic pollutants, such as pesticides and heavy metals, at concentrations greater than those laid down in EU or other international standards.

20. Several countries, particularly those with large cities situated in coastal areas, find it increasingly difficult to have access to drinking-water sources of sufficient quality to allow purification at reasonable cost. At times, their health standards are not met because of contamination of drinking-water source areas.

21. The 2000 Global Water Supply and Sanitation Assessment Report, prepared by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), assessed the population with access to "improved" water supply and sanitation (see fig. III). The "improved" or "not improved" classifications were based on the technology applied for water supply and sanitation. North America and Europe (according to the country grouping of this report), except Romania, had improved water supply (house connections) and sanitation (sewers) nearly everywhere. The coverage was higher in urban than in rural areas. Kazakhstan, Kyrgyzstan and Uzbekistan all had improved water supply and sanitation in most urban areas, while water supply in rural areas was much less improved throughout Central Asia (see box 2).

Box 2: Water supply in rural Tajikistan

In 1995, it was estimated that less than 10% of the rural population of Khalton province had access to safe drinking water and less than 5% to sewerage systems. For example, in Gozimalik district, just 5% of the population had access to safe water and only 2% to safe sanitation. In Jillikul district, the situation was even worse, with 4% of the population having access to safe water and no one with access to safe sanitation.

The absence of clean water has had a devastating impact on hygiene, especially in rural schools and hospitals. Health education, although obligatory under the Soviet regime, has increasingly been neglected. The results are evident in deteriorating child health. The infant mortality rate, which increased in 1993–1994, remains one of the highest among the former Soviet Union countries.

Source: /2/

22. Taking into account the people that are currently unserved and the predicted population development, the Assessment Report estimates that in Europe alone (excluding the Caucasus and Central Asia) another 22 million people in rural areas will need improved water supply and 25 million people in urban areas will need improved sanitation to meet the 2015 targets. In addition, a significant number of people will need service coverage in the Caucasus and Central Asia, particularly water supply in rural areas.

23. In EECCA, new problems have emerged during the past decade. The under-five mortality rate of diarrhoea diseases (see fig. IV) and incidences of water-related diseases, for example, hepatitis A (see fig. V), are significantly higher in most EECCA countries than in Central and East European countries and in the EU. This also causes a heavy cost to the public health system and the economy. In the Republic of Moldova, for instance, the National Environmental Action Plan calculated the social and economic impact of water pollution and reached the conclusion that polluted drinking water leads to 950-1850 premature deaths a year as well as 2-4 million days of illness a year. The monetary cost to the economy was assessed to be as high as 5-10% of GDP.

North America, the EU member States and the accession countries have national legislation that requires not only better sanitation, but also better waste-water treatment. Regulations on drinking-water quality require additional investments in water supply. Moreover, the Parties to the Protocol on Water and Health have to comply with its provisions on water and sanitation.

Even though the UNECE region as such can comply with the 2015 target with only modest investments, national and subnational legislation will require much higher investments.

Such investment is particularly needed in EECCA countries. Water utilities in many of these countries find it increasingly difficult to provide service continuity.

Waste-water treatment plants are increasingly becoming the main polluters of surface water in EECCA countries, and in numerous cases decaying sewerage pipes cause cross-contamination of drinking water. Consequently, demand for clean potable water from alternative sources is growing rapidly and water vending and bottled water business is growing in all EECCA countries.

24. EECCA countries have since the late 1990s started to react to this development with municipal sector reforms comprising decentralization, transformation of water utilities into municipal enterprises and phase-out of government subsidies. This "shock-therapy" reform, which took place without appropriate tariff and institutional reform, appears to fall short of expectations. In 2000, EECCA and other UNECE Ministers agreed to make this a key area for international cooperation.

25. However, for Western Europe new challenges are emerging too. Concern over the greater vulnerability of children and the elderly with weakened immune systems to infections of viruses and parasites that are often highly resistant to chlorine disinfection, and the need for treatment for nitrates and pesticides in water supplies, is growing. Ageing pipe networks (see conclusions below) also add to these problems.

In the region, ageing pipe networks, requiring expensive maintenance or upgrading to cut leakage and enable a more continuous supply, and the tightening of drinking-water standards to comply with the provisions of the Protocol on Water and Health and/or the relevant WHO guidelines continue to put high demands on institutional capacity and on funds.

C. Water for sustainable food production and rural development

26. Water withdrawal for irrigated agriculture differs greatly across the region. In Western and Northern Europe and North America, agriculture accounts for less than 50% of the water withdrawal, whereas EECCA and the South European countries use more than 50% of their water withdrawals for irrigated agriculture. In Central Asia, the proportion is 80-95% (see fig. VI). The majority (85%) of the irrigated land in Western Europe is in the Mediterranean area (France, Spain, Italy, Portugal, Greece). In the EU accession countries, the bulk (93%) is in Romania and Turkey. In the EECCA region, the Aral Sea basin accounts for 51% of the total

irrigated land. Several new water-supply projects are planned in Europe and the rehabilitation of the badly maintained irrigation structures in Eastern Europe and EECCA may boost the demand for irrigation water.

To reduce the pressure of agriculture on the quality of receiving waters, most countries in estern Europe have embarked on agro-environmental programmes that combine various approaches involving, inter alia, technology, awareness raising, community participation, cost-sharing and regulation to reduce inputs of fertilizers and farm chemicals and to minimize leaching of residues to natural waters.

27. Agro-environmental programmes have been quite successful (e.g. in reducing fertilizer and pesticide use), but they are often cumbersome to administer and difficult to enforce. In other cases, nutrient loading has been reduced, but without any direct effect on groundwater quality owing to the accumulated load already present in the soil. The high cost of some measures to reduce nutrient loads is another obstacle to progress. Good results could be obtained at little economic cost by cutting agricultural production subsidies, but social costs might have to be considered. Innovative approaches can nevertheless be reported, such as a water utility paying farmers to reduce fertilizer and/or pesticide use in some areas rather than having to invest in purification equipment or to seek other water resources at some distance.

28. The role of the pricing regime for agricultural water is being considered as a mechanism to make water use more efficient without necessarily introducing a financial burden. Of all the user groups, agricultural water users currently pay the smallest share of the real cost of their water provision. This practice should be phased out, bearing in mind the social consequences of more expensive water for irrigation. Several countries in Western Europe have already made significant progress in this difficult process, and others are considering such changes. New pricing structures, with social support measures possibly associated, are key features of these reforms. In other countries, few measures are taken against nitrate or pesticide pollution or over-abstraction from agriculture, and industry or households fund the only measures being taken.

29. Water users have been given a greater role in resource management. For example, in some countries, such as the West European Mediterranean countries, Turkey and to some extent Tajikistan, responsibility (including financial responsibility) for management or sometimes even ownership of community irrigation systems is being or has been transferred from public bodies to user associations. Amended legislation in some EECCA countries introduces programmes to encourage the setting-up and capacity-building of irrigation user groups, acknowledging the pivotal role of water management at the lowest appropriate level in order to maximize water efficiency.

Box 3: Rehabilitation of irrigation and drainage in Central Asia

The Central Asian countries in the Aral Sea basin have some of the largest irrigation schemes in the world, and at the same time have to face the environmental consequences of unsustainable large-scale irrigation.

Some 22 million people and between 20% and 40% of GDP depend directly or indirectly on irrigated agriculture.

At present, besides the enormous environmental damage, the irrigation and drainage infrastructure is falling apart. Farmers cannot afford to maintain the schemes and neither governments nor international donors have sufficient resources to rehabilitate anything but a small proportion of the schemes. Yet, the economies of most countries in the region are not creating alternative jobs to absorb people who will be displaced as farming becomes impossible.

A recent study */25/* has found that the case for the rehabilitation of many irrigation and drainage schemes in Central Asia is strong for several reasons, namely: (a) many schemes appear to be economically viable; and (b) halting the deterioration of irrigation infrastructure would benefit especially the poor.

The same study concluded that governments should consider increasing investments in rehabilitating those systems that meet sound economic criteria and have reasonably strong institutions, while always continuing vital policy and institutional reforms. Irrigation rehabilitation – if carefully designed – should be considered as one important component in a strategy for social and economic recovery in Central Asia.

Other sources of information call for a holistic approach to water management in Central Asia, pointing to the fact that unsustainable agricultural development was one of the reasons for the damage to the water environment, particularly the Aral Sea environment.

30. Severe droughts in many parts of the region in the 1990s, as well as growing awareness of the effects of water-related subsidies on water use and aquatic systems, have reawakened interest in some countries, such as Spain and United States, in the role that tradable water rights and water markets could play in allowing water use to move national up towards higher-value applications. Some limited systems are already in operation in these countries, but in many cases establishing markets will depend on creating suitable water-right regimes and water conveyance systems that can meter and control the flow of water among users.

The challenge for agricultural water use in the developed part of the UNECE region is to improve water productivity in order to protect water ecosystems from overexploitation rather than to increase food production through the expansion of irrigated agriculture.

In some countries in South-East Europe, the Caucasus and Central Asia, however, there may be a need to increase food production: the proportion of undernourished people in some of these countries has reached more than one third, and has been increasing over the past decade. However, this is largely attributable to the deterioration of the infrastructure, including irrigation systems, and the general reduction in industrial and agricultural output during the economic transition.

31. Per capita food consumption decreased in the countries in transition between 1985 and 1998, but it is still above the threshold of 2,700 kcal/person/day. This shows that undernourishment is a distribution problem (caused by poverty) rather than a total output problem.

32. In a few dry regions of several UNECE countries, water scarcity has become a limiting factor on development, and the need to allocate water to the highest-value uses is greatest in arid and semi-arid regions. Even where competition for off-stream uses is less strong, growing demand for various in-stream uses and growing demand to maintain groundwater table levels (e.g. for recreational purposes and to preserve wetlands and other ecosystems) will promote greater efficiency of agricultural water use.

33. The EU and Central Asian countries have paid increasing attention to the need for management technologies to conserve water in agriculture and to maximize "the crop per drop" by developing appropriate water and soil management strategies. Major research programmes focusing on water scarcity management have been launched during the past decade, and water scarcity has been an important aspect in EU support to water management in Central Asia. In this respect, experiments with the involvement of end-users through water users' associations (WUAs) have shown promising results, for example in Turkey (see box 4) and Central Asia.

34. Addressing the needs of water-scarce and salinity-logged areas, there is still scope for achieving "more crop per drop", for example, through the development of more salt-tolerant crops and drought-resistant crops through genetic engineering.

Box 4: Participatory privatization of irrigation management in Turkey

The World Bank has implemented projects to: (a) strengthen irrigation institutions - governmental and WUAs; (b) transfer operation and maintenance responsibility to WUAs; (c) reduce public sector subsidies for investment; and (d) promote the efficient and sustainable use of irrigation systems, so as to improve agricultural productivity.

Project financing is mainly for operation and maintenance equipment for the WUAs, institutional strengthening and pilot drip-and-sprinkler irrigation schemes. This is the largest and most mature of the irrigation and drainage projects supporting WUAs, covering 1.5 million ha, through financing of operation and maintenance equipment, to which WUAs will contribute 70%.

As the "leader" in participatory management, Turkey's experience needs to be carefully evaluated for the benefit of other countries.

Source: /25/

D. Water and sustainable urban development

35. Good urban water management is complex and requires not only water and waste-water infrastructure but also pollution control especially in industries, rational use of water, waste-water management and flood prevention. In addition, it requires coordination across many sectors and

usually between different local authorities as most cities' water supplies and waste-water services are not limited to catchments within their boundaries. The importance of (a) ensuring good water quality for water systems used for recreation and (b) limiting ecological damage to the water system, which receives water, storm and surface water run-off, has added significantly to the challenges for the authorities. All these tasks require governance structures that provide a sound legal, institutional and financial basis. In the cities with rapidly growing populations or those with weak economies and limited possibilities for raising funds for water management, these structures must also be adapted to the particular difficulties facing local authorities.

36. In the UNECE region, the number of people living in cities has increased steadily during the past century and is expected to continue to do so for the next decades. The overall growth in population, however, has been modest, so the growth in the urban population is caused by migration from rural to urban areas. In most UNECE countries, 60-80% live in urban areas. The UNECE region has about 100 cities with a population of more than 1 million:. 26 of these have a population between 3 million and 10 million and two (New York and Los Angeles, United States) with more than 10 million people.

37. Although urbanization has increased, consumption of water has fallen in most of Western Europe (see fig. II) during the past decade as a result of urban water services having focused on water savings, increasing metering and the use of economic instruments (water charges and tariffs). In other cities of the UNECE region, for instance in South-East Europe, urban water use has continued to increase as more homes are connected to water-supply systems, more households are formed and people adopt more water-consuming lifestyles. In the accession countries and EECCA countries, urban water use has decreased since 1990 primarily because big industrial water users have closed down and subsidies for water have gradually been removed.

38. Urban water utilities have installed meters with end-users in most countries in Western Europe. This has proved effective in reducing water use. Only recently have meters been introduced in Eastern Europe and EECCA (see fig. VII).

39. Unaccounted-for water, which in many cases reflects the efficiency of a water utility, is low in western countries of the region and high in most EECCA countries (e.g. Republic of Moldova, Russian Federation and Ukraine) and in a few Central and East European countries (Romania and Bulgaria). The main reason for their high figures is loss in the distribution system.

Agenda 21 recommends that States should ensure that: (a) all urban residents have access to at least 40 litres of safe water per day and at least 75% are provided with on-site community facilities for sanitation; (b) discharge limits for municipal and industrial effluents are applied; and (c) at least 75% of solid waste generated in urban areas is managed in an environmentally safe way.

In most EU member States and accession countries, the targets of Agenda 21 have been met. There is a more or less universal provision of advanced water and sanitation facilities and other urban water services. Most are provided by public sector utilities, although increasing use is being made of private sector provision. In urban areas of EECCA countries and some Central and East European countries, the water and sanitation infrastructure exists but is often in poor condition.

40. Many UNECE countries are threatened by major floods, with severe economic and social impacts. Flooding is becoming the most common and costly "water-quantity problem" in the Mediterranean region as well as in parts of Western and Central Europe and North America. This is one area where the economically advanced Western countries of the region seem to be experiencing increasing problems.

41. In Europe, economic losses due to floods and landslides between 1990 and 1996 were four times those of the entire 1980-1989 decade. The 1993 Mississippi flood cost more than all previous United States floods combined in terms of economic losses. In recent years, disaster plans have been implemented in the Rhine basin, in Central Europe, in France and in other countries where the population has suddenly experienced major flooding and economic losses equivalent to a few per cent of GDP.

42. Flood damage has increased and often hit urban areas particularly hard. Additional measures will be required along rivers to protect dykes. Development in flood plains results in increased damage when protection measures fail because of poor maintenance or insufficient infrastructure strength. Common factors exacerbating this problem are fragmentation of responsibilities and lack of integration of flood protection, land-use planning and flood damage compensation policies.

43. Some progress has been achieved in EECCA in moving towards a more sustainable development of the urban water-supply and sanitation sector. EECCA Ministers adopted a set of guiding principles in Almaty (Kazakhstan) in 2000 and a reform programme has been initiated. Both need genuine commitment by the countries.

44. Many urban centres throughout the region have outgrown their capacity to provide adequate water supplies, as all nearby surface water sources have been tapped and/or as groundwater resources are being drawn on much faster than the natural rate of recharge. There are examples of cities that have established water management systems for the whole watershed that they are drawing water from. The city administrations have made agreements with upstream farmers on the application of best agricultural practices, acquired land in the watershed vital to protect future water quality, imposed stricter water management regulations, etc. Such approaches will be needed more in the future to cope with the increased urban water demands.

45. With regard to floods, a more proactive land-use policy across an entire watershed (including "green corridors" along rivers and streams, reinstatement of flood control plains, better control of deforestation, and preservation of wetlands), combined with enforcement of zoning provisions may contribute to reversing the trend in the long term. It may even be necessary for potential flood victims to assume a greater share of the risk through higher flood insurance premiums or reduced compensation for flood damage. All UNECE countries are taking measures to better prepare for and cope with extreme events, be they floods or droughts.

E. Means of implementation

Compared with other regions, many countries of the UNECE region seem to be well advanced in the introduction of economic instruments, such as water fees and fines, water-related taxes, water-related subsidies given through environmental funds and voluntary instruments. Environmental management systems for enterprises have reduced industrial water use and emissions and public-private partnerships have made water services provision more effective.

46. It has been shown in many East European countries that increasing water prices effectively to decreases water use. In Hungary, for example, water prices increased 15-fold after subsidies were removed and during the 1990s this led to a reduction in water use of about 50% (see fig. VIII).

47. Analyses of water affordability in EECCA countries have demonstrated that water bills are already a heavy burden on household budgets, especially for low-income families. If water becomes more expensive, the poorer families may need to reduce their water consumption even further which, again, might lead to an increase in water-related disease. It is clear that crucial rises in water tariffs will be a challenge for the poorest sections of the population. To ensure social acceptance of water sector reforms, it is therefore essential to give sufficient attention to this issue and to take adequate measures to protect the poor. As concerns the economic reforms of the water supply and sanitation sector, one of the key reasons for the continued decline in water services in EECCA is the chronic underfunding of the sector. In particular, water utility revenues are typically insufficient even to cover essential operating and maintenance costs, largely due to extremely low water tariffs.

48. The protection of the aquatic environment can only be achieved through further integration of the different policy areas and management of water-using sectors. Integrated water resources management procedures and the EU Water Framework Directive have promoted such developments in Western, Central and East European countries, encouraging, for example, farmers to change land-use practices to reduce nitrate leakage into groundwater and to apply pesticides in a more environmentally friendly way. Industries have been encouraged to invest in new technologies to reduce emission, and consumers have been encouraged to buy environmentally friendly products, like biodegradable detergents.

49. In EECCA and some countries in South-East Europe, utility companies are inefficient. Weak incentives for environmental improvements, low fees and fines for resource use and violation of emission limits, subsidies and the recession have provided little stimulus for environmental action by industries. As a result, industries have not introduced the less resource-intensive technologies and pollution control measures that could have improved both their competitiveness and reduced their environmental pollution.

50. Substantial domestic and international funds for water and sanitation infrastructure and services development have been raised in Western, Central and Eastern Europe.

51. It is estimated that, for example, the EU countries will have invested about €130 billion or an average of €307 per person equivalent in the 1993-2005 period to comply with the Urban Wastewater Treatment Directive. About half of this is for collection systems. It is estimated that the seven Central and East European countries that will become members of EU in May 2004

will need to invest about €12 billion in urban waste-water treatment and about €8 to 10 billion in drinking-water supply over the next 10 years to comply with EU legislation.

52. The accession countries have covered about 90-95% of the investment from their domestic budgets. Public sector expenditures in the whole region rely on three major sources of finance: local government revenues, transfers from central government budgets, and grants and soft loans from environmental funds. Municipalities have problems securing financing for investment and many have been exploring new opportunities including involving the private sector and issuing municipal bonds. Environmental funds have played an important role in financing environmental investment in many countries, covering up to 40% in some and from 10 to 20% in most of Central and Eastern Europe.

53. Industrial water use has also fallen in Western countries (see fig. II). Western Europe has invested in less polluting production methods and in pollution control equipment. In EU and accession countries, the Integrated Pollution Prevention and Control (IPPC) Directive has introduced best available technology (BAT) in the most resource-intensive and polluting industries. Some have started to implement environmental management systems, such as the EU Eco-management and Auditing Scheme (EMAS) or the International Standardization Organization's (ISO) 14000 series. Governments have to some extent supported this development through subsidies or technology development programmes targeted in particular to polluting and resource-intensive industries. There has only been limited development in this field in EECCA.

54. Central, East and South-East European countries have obtained substantial assistance in the water sector through bilateral donors, EU programmes and international financing institutions. Through the 1996-2001 period, external assistance for the environment sector increased and reached 0.1-0.9% of GDP in recipient countries. On average, 50% of all donor funds spent on the environment sector supported reform capacity-building and investment.

55. In EECCA, domestic sources also generally account for the largest share of environmental expenditures. In 1996-2001, domestic sources accounted for about 90% in most EECCA countries; for a few countries, this share was about 30% (Armenia, Georgia, Kyrgyzstan). Most EECCA countries seem to devote almost the same share of their incomes to environment-related expenditures as Central and East European and EU countries do. In most countries, water supply and sanitation account for the largest share of environmental expenditures - typically 50 to 85%. Absolute values in EECCA countries, however, are very small because of the very low incomes.

56. Environmental assistance from donors to EECCA countries have increased in absolute terms and as a share of total development aid in the 1996-2001 period. Water supply and sanitation have been the major beneficiaries.

57. Overall cooperation and coordination in the water sector in the Central and East Ejropean and EECCA subregions have improved during the past decade. Under the "Environment for Europe" process, the Environmental Action Programme and the OECD task force put in place to support its implementation have assisted the Central and East European in their water sector reform. The Regional Environmental Centres have facilitated environmental dialogue, networking and regional cooperation mainly to bring civil society into the transition process. The Project Preparation Committee hosted by the European Bank for Reconstruction and Development has assisted in coordinating international financing institutions', donors' and

countries' support to investments in infrastructure. From the mid-1990s, EU accession programmes have played a major role for the accession countries.

58. From 1998, the "Environment for Europe" process has increasingly focused on EECCA. The further work on the Environmental Strategy agreed by the UNECE Environment Ministers in Kiev in May 2003, and a number of existing and new subregional (Central Asia, Aral Sea basin and Caspian Sea basin) and transboundary agreements will strengthen cooperation and coordination in the water sector in this region (see box 5).

Box 5: EECCA Environmental Strategy – Ministerial Declaration

"...We adopt the "Environmental Partnerships in the UNECE Region: Environmental Strategy for Countries of Eastern Europe, the Caucasus and Central Asia. Strategic framework" intended to contribute to improving environmental conditions and to implementing the WSSD Plan of Implementation in Eastern Europe, the Caucasus and Central Asia by strengthening the efforts of these countries in environmental protection and by facilitating partnership and cooperation between these countries and other countries of the UNECE region, including all stakeholders. We welcome the Strategy's key objectives and areas of action to:

…(a) Improve environmental legislation, policies and institutional framework;

…(b) Reduce the risks to human health through pollution prevention and control;

…(c) Manage natural resources in a sustainable manner;

…(d) Integrate environmental considerations into the development of key economic sectors;

…(e) Establish and strengthen mechanisms for mobilizing and allocating financial resources to achieve environmental objectives;

…(f) Provide information for environmental decision-making and promote public participation and environmental education;

…(g) Identify and address transboundary environmental problems and strengthen cooperation within the framework of international conventions, as applicable...".

Source: /29/

59. Some governments in Central and Eastern Europe and EECCA have increasingly looked for private sector partners to provide two key resources: (a) improved management systems and technical options and (b) funds. The international financing institutions, like the World Bank, have initiated a number of projects with management contracts in EECCA, which have resulted in improved service provision. Foreign direct investment (FDI) in the urban water sector has increased worldwide during the past decade and reached US$ 25 billion in 1997. However, FDI flows have been concentrated on a small number of countries; and Central and Eastern Europe and EECCA obtained only 6% of this amount. The main reason seems to be the high financial

risk perceived by private investors. In EECCA, only two projects with private sector involvement seem to be under development (St. Petersburg in the Russian Federation and Almaty in Kazakhstan).

60. At the WSSD, the EU together with the EECCA countries launched a partnership to implement the water aspects of the Johannesburg Plan of Implementation, i.e. the 2015 targets on water supply and sanitation and the 2005 target on integrated water resources management and water efficiency plans. This partnership was adopted in Kiev, at the fifth "Environment for Europe" Ministerial Conference as an important tool to meet the WSSD targets as well as those of the EECCA Environmental Strategy.

Public awareness of environmental problems, public pressure to solve them and public participation in decision-making have been essential for the development and implementation of effective environmental policies in Western Europe. However, the conditions for public participation in decision-making are still difficult in other countries, particularly in EECCA.

Throughout Central and Eastern Europe, the number of NGOs grew rapidly during the 1990s and in 1997 the number of environmental NGOs, of which a number also focus on water, was estimated at about 3000. NGOs have tried to act as catalysts for environmental improvement. They have provided environmental information to the public, undertaken environmental protection projects and participated in government decision-making. The adoption of the UNECE Aarhus Convention has been a major step forward in providing NGOs and civil society with the right to get information and participate in decision-making. The NGO movement has been weaker in a number of EECCA countries, and they have had less influence on the political process than in Central and Eastern Europe.

61. The level of technical education in the water sector is generally high throughout the UNECE region. Higher education on water and water-related subjects are offered in all countries, and all Western and most Central and East European countries have training institutions for water service managers and personnel.

Box 6: Environmental education and awareness-raising

The Green Pack, developed by the Regional Environment Center for Central and Eastern Europe, is a multi-media environmental education curriculum kit primarily intended for Polish secondary school teachers and their students, although it can also be used at other levels of education.

It focuses on particular aspects of environmental protection and sustainable development, and includes a variety of educational materials, such as:

- Teacher's handbook with lesson plans and fact sheets for students;
- A video cassette with animated clips and educational films;
- An interactive CD-ROM with extensive information on various environmental topics;

- A dilemma game; and
- Other printed materials.

Thus, the users of the pack will be able to follow lesson plans, complemented with video presentations and additional information from the CD-ROM and its links to similar web sites.

Rather than focusing on the accumulation of knowledge in particular environmental areas, the Green Pack emphasizes the formation of new values in students and a new model of behaviour at school, at home and in society.

Source: /30/

62. A step towards even better environmental education in the region was taken at the fifth Ministerial Conference "Environment for Europe" in Kiev in May 2003. The Conference agreed on a statement on Education for Sustainable Development and invited Education Ministers and other Ministers, in close cooperation with the United Nations Educational, Scientific and Cultural Organization (UNESCO), to take an active part in the development of a regional strategy for education for sustainable development. It confirmed that education was a fundamental challenge and a tool for environmental protection and sustainable development and invited all countries to promote education as a key agent for change.

II. CONCLUSIONS

A. Conventions and protocols

63. Progress:

(a) UNECE Water Convention ratified by 34 countries and the European Community;

(b) Significant activity with regard to negotiating and signing water basin agreements, modelled on the UNECE Water Convention;

(c) Government accountability, transparency and responsiveness in environmental matters promoted through the Aarhus Convention, which has been ratified by many Central and East European and EECCA countries;

(d) Most countries have initiated national planning processes like National Environmental Action Plans.

64. Challenges

(a) Ratification of UNECE environmental conventions and protocols by countries that have not already done so;

(b) Ratification of existing bilateral and multilateral agreements in the region;

(c) Drawing up bilateral and multilateral agreements and other arrangements where these do not exist, or adapt existing ones in order to define mutual relations and conduct regarding the prevention, control and reduction of transboundary impact and other issues relevant to integrated water resources management.

B. Legal and regulatory aspects

65. Progress:

(a) Polluter-pays principle and user-pays principle embedded in law in almost all countries;

(b) Clear goals and targets set for water bodies in EU through the Water Framework Directive: “Good status” required by 2015;

(c) River basin management approaches introduced in most countries, and mandatory in EU.

66. Challenges:

(a) Complete regulatory framework in EECCA;

(b) Implementation and enforcement of newly adopted water legislation, especially in EECCA.

C. Institutional arrangements

67. Progress :

(a) Almost all countries have a national body responsible for water policies, strategies and national planning;

(b) Water management, especially water services, decentralized in most countries;

(c) Joint bodies established for a great number of transboundary surface waters and some groundwaters.

68. Challenges:

(a) Full implementation of the tasks of joint bodies for shared water resources, and establishment of joint bodies for transboundary waters (rivers, lakes, groundwaters) where they do not yet exist;

(b) Capacity-building of river basin management institutions and financing of water resource management services.

D. Monitoring and water resources assessment

69. Progress:

(a) Water resources assessment services established in all Western countries;

(b) Some Central and East European countries have revised and updated their monitoring programmes;

(c) Two thirds of UNECE countries report that they have made progress or already implemented Agenda 21 measures on freshwater monitoring.

70. Challenges:

(a) Move from data collection to creation of policy-relevant information;

(b) Counteract deterioration of monitoring systems in many EECCA countries due to the lack of financing;

(c) Rehabilitate of water monitoring networks in EECCA;

(d) Harmonize of monitoring and assessment procedures through international cooperation and participation in international networks, especially for Central and eastern Europe and EECCA.

E. Protection of water resources, water quality and aquatic ecosystems

71. Progress:

(a) Total water withdrawals have fallen in most subregions during the past decade;

(b) Good progress in reducing and cleaning effluent discharges (in EECCA partly because of declining economic and industrial output);

(c) In Western Europe and EU accession countries, water quality has generally improved;

(d) Significant progress across the region in management of water resources and quality as a result of policies and measures implemented;

(e) More than half the countries report that they have made progress or implemented Agenda 21 measures on water pollution prevention and water treatment.

72. Challenges:

(a) Achieving ecosystem protection and ambient water quality objectives;

(b) Control of diffuse pollution sources and deposits of nutrients, heavy metals and persistent organic pollutants;

(c) Prevention of overuse and contamination of groundwater aquifers;

(d) Completion, restoration and upgrading of waste-water treatment infrastructure;

(e) Better integration of water management aspects into other sector policies.

F. Structural and non-structural measures related to drinking-water supply and sanitation

73. Progress: North America and Europe have improved water supply and sanitation nearly everywhere. In Europe and especially in Central Asia, rural coverage is considerably lower than urban coverage.

74. Challenges:

(a) Reducing microbial pollution of drinking water, especially in Central Asia and other EECCA countries;

(b) Municipal water sector reforms, decentralization, transformation of water utilities, phase-out of subsidies, in EECCA;

(c) Ageing pipe networks requiring expensive maintenance or upgrading in most of the region;

(d) Policy and institutional reforms in EECCA to maintain, operate and upgrade water infrastructure and management systems;

(e) Assistance from Western countries to infrastructure rehabilitation in EECCA.

G. Water for sustainable food production and rural development

75. Progress:

(a) Reduction in use of fertilizers and pesticides;

(b) Innovative application of watershed protection by paying farmers to reduce diffuse pollution in sensitive areas;

(c) Progress in Western countries in removing subsidies from agricultural water use;

(d) Water efficiency gains achieved through management by water users' associations (WUAs).

76. Challenges:

(a) Protection of water resources along with rehabilitation and expansion of irrigation systems;

(b) "More crop per drop" of water used for agriculture, tolerant crop development.

H. Water and sustainable urban development

77. Progress:

(a) Agenda 21 targets on urban water issues have been met in most Western and EU accession countries

(b) Urban water use has fallen, partly due to the installation of meters.

78. Challenges:

(a) Vulnerability towards floods increasingly high, also in Western Europe;

(b) Integrated flood management approaches to reduce flood vulnerability;

(c) Water transfer schemes to cover urban growth and measures to manage urban water demand.

I. Means of implementation

79. Progress:

(a) Many successful examples of economic instruments (fees, fines taxes, environmental funds, etc.) have led to a reduction in water use and pollution; EECCA lagging behind;

(b) Best available technology and environmental management systems widely introduced in Western countries;

(c) Environmental assistance to EECCA has increased, with the water sector receiving the most of the support;

(d) "Environment for Europe" process as a vehicle for cooperation and coordination of environmental assistance to Central and Eastern Europe (previously) and EECCA;

(e) Involvement of NGOs (facilitated e.g. through the Aarhus Convention) acted as a catalyst for environmental improvement in Central and Eastern Europe; less so in EECCA.

80. Challenges:

(a) Involvement of private sector in financing water infrastructure rehabilitation in EECCA;

(b) Finding the appropriate mix of economic and regulatory instruments;

(c) Securing additional resources for municipalities, in particular in EECCA, from investment in the water sector.