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ACTIVITIES OF THE UNITED NATIONS SYSTEM IN THE FIELD OF WATER AND MINERAL RESOURCES, AND INTER-AGENCY COORDINATION FOCUSING ON PROGRESS MADE TOWARDS ACHIEVING SUSTAINABLE DEVELOPMENT

Activities of the Economic Commission for Europe in the area of water resources

Note by the Secretary-General

The report of the Economic Commission for Europe in the area of water resources, available in the language of submission, is contained in the annex below.

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Annex

REPORT OF THE ECONOMIC COMMISSION FOR EUROPE IN THE AREA OF WATER RESOURCES

Overview of Transboundary Watercourse and International Lakes in UN/ECE Countries

The extent of the economic and environmental relevance of transboundary watercourses and lakes and rivers is clearly demonstrated by the magnitude of these resources and the boundaries through which water flows. In fact, more than 50% of the thirty-one major river basins in Europe with a drainage area of over 50,000 km^2 have transboundary catchments. Moreover, a great number of small and medium-sized waters crisscross the boundaries between two or more states. For centuries, water has played an important economic role in these catchment areas in Europe without particular thought being given to the notion of preventing, controlling and reducing transboundary impacts.

The long history of water-construction works has led to a situation where most transboundary waters in Europe are heavily regulated and hence are far from their pristine conditions. The effects of river regulation are not just felt locally and there is often an impact on downstream and surrounding areas. The impact has led to conflicts between various uses including conflicts between riparian countries. Concern over the severeness of flood events, particularly as a consequence of man-made alterations of river banks, river beds and floodplain, is also growing.

Water use by industry and agriculture also threaten water quality, fisheries, shore use or the balance of ecosystems. The pollution of transboundary watercourses and international lakes has become a widespread phenomenon in Europe and a matter of particular concern. Freshwater supply in European countries is often dependent upon such external sources, in the Netherlands, for example, two-thirds of the water supply depends on the Rhine.

It appears from submissions to the ECE secretariat that organic pollution is considered a serious problem for the rivers Danube, Daugava, Dniepr, Elbe, Meuse and Scheldt. The bacteriological quality of some transboundary rivers in Europe, although improving, is low. Algal growth in transboundary surface waters is a major problem in parts of Europe as a result of pollution from agricultural sources. Trends in pollution by heavy metals and other toxic substances are not very encouraging either. For example, critical values of cadmium concentration are exceeded in the Rivers Danube, Dniepr, Elbe, Neisse and Oder. High levels of DDT have been detected in the River Oder. Although only limited results of water quality measurements in transboundary waters are available, it may be concluded that these, like many internal groundwaters, experience nitrate concentrations above drinking water standards and show signs of contamination of heavy metals, metalloids and pesticides.

To enhance the protection of waters and reduce transboundary impact requires reliable data. There are signs that the availability of water quality and water quantity data in Europe is improving, and progress is being made in the introduction and use of harmonized collection methods and a broadened exchange of information. Examples at the subregional level include activities of joint bodies, for example, those established for the rivers Danube (at interim) Elbe, Oder (at interim) Rhine and the Finnish-Russian waters, and the lakes Constance and Geneva. At the regional level the situation is quite different. Data availability is still inadequate and requires joint efforts under the Water Convention in order to avoid piecemeal solutions to serious

problems. The same applies to data on the status of water treatment facilities in transboundary catchment areas, where at the regional level only sporadic information is available on the status of sewer networks (number, type and capacity of waste water treatment plants) and methods of sewage sludge treatment and disposal is available. In all likelihood this impedes the planning of assistance to countries in transition.

National strategies

A number of ECE countries have defined national strategies with respect to the protection and use of water resources and are in the course of drawing up their strategies to respond to the objectives of the ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes. While the strategies vary from country to country, there is a common thread throughout them. Many of the countries have expressed the need to limit waste water emissions and to undertake comprehensive water quality measures. In addition to these needs, there is agreement on the precautionary and polluter-pays principle. In most cases, however, the strategies are presented in very general terms without quantifiable goals and objectives. An exception to this is the strategy in the Netherlands whereby the primary objectives is to achieve a water quality comparable to what it was in the 1930s. The strategy is defined in such a way as to present specific goals to be achieved, e.g. a 50% reduction in emissions by 1995 compared to 1985, with further reductions after 1995. It appears that the driving force for these elaborated national strategies are the international conventions such as the North Sea and the Baltic Sea.

At the same time that emphasis is given to these areas, there is a widely acknowledged concern of the need to achieve sustainability of water resources. Many countries have developed broad strategies to promote sustainable water management taking into account transboundary waters. Such strategies attempt to cover in an integrated way quality and quantity aspects of the management of surface waters and groundwaters, as well as the ecosystems. While noting the necessity to promote sustainability of water resources, within the context of national strategies, sustainability is most often presented in general terms as a goal. Sustainability is something to aim for, however, it is most difficult to achieve.

Control of point sources

Progress has been achieved in Europe in the development and application of waste water treatment and sanitation technology, the establishment of appropriate design standards, and the adoption of restrictive discharge authorization procedures. Total volumetric discharges of effluent have been cut by introducing in-plant measures and modifying production processes. From the regulatory point of view, discharge-oriented control based on technological requirements is applied in a wide variety of industries. For new industrial plants, the application of best available technology is frequently required to achieve maximum pollution prevention together with an optimum degree of safety.

In France, these measures require substantial financial resources, for example, a financial

programme on water covering the 1992-1996 period was adopted in 1991. Of a total of US$ 13.5 billion, some US$ 9 billion will be spent on reduction of pollution from point sources in the municipal and industrial sectors. Some 80 per cent of this latter amount will go to the construction or upgrading of municipal sewer networks and treatment plants, whereas the remaining 20 per cent is foreseen for the reduction of pollution from industries. These sums are roughly double the amounts spent for the same purposes in the 1986-1991 period.

Most central and eastern European countries suffer the consequences of past developments. Industrial waste waters are frequently discharged into the sewer network or directly into the recipients without any proper pre treatment. Moreover, a great number of the public treatment plants in central and eastern Europe are only mechanical-biological plants. Treatment plants are often overloaded, improperly operated and use inappropriate treatment technologies. The degree to which the load of pollutants is reduced is therefore often smaller than expected.

Not withstanding progress already made and planned measures in countries in transition there are several issues to be raised. For example, while limits are set for emissions, are these in fact realistic taking into account the benefits arising from decreased pollution and the costs associated with achieving these benefits involved. Many countries lack funds for the construction of waste water treatment plants, and a prudent approach could well be that no new plants are built until one can assure adequate treatment of waste water prior to discharge into sewer systems or receiving waters. Such a policy is already practiced in some countries. There is always the question of upgrading existing treatment plants or constructing new ones. A complete examination of alternatives is clearly required prior to approval of new construction. If waste water is treated prior to disposal into sewer systems, then clearly there is less need for new construction and greater justification for upgrading of existing facilities. The polluter-pays principle must be strictly enforced.

Attention should be directed towards the concept of Best Available Technology. ECE countries have repeatedly made reference to the adoption of BAT. The Convention on Transboundary Waters includes in Annex 1, a definition of the term best available technology. This definition is taken to mean the latest stage of development processes, facilities or methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste. The definition takes note, that among many factors, special consideration must be given to the economic feasibility of such technology. The importance given to economic feasibility is in direct contrast to the position adopted in Germany. In the latter case, the German Federal Water Act gives greater weight to ecological concerns than to the economic feasibility of such technology.

Control of non-point sources

Various measures have been taken in Europe to decrease pollution from non-point sources in agriculture. Their ultimate goal is to ensure that the total amount of nutrients applied to farmland, including chemical fertilizers, manure, slurry and urine, does not exceed the amount

taken up by crops.

Many widely-used pesticides have been classified as a potentially high risk for leaching into groundwaters, and have accordingly been phased out in some European countries. Action programmes aimed at reducing pesticide use by up to 50 per cent have been drawn up, for example, in Denmark and Sweden. France has developed a particular action programme for the protection of waters against pollution by pesticides. Only a limited number of pesticides are licensed in this country for the control of weeds in water bodies. There are strict conditions for their use, such as a limited time period of application or application on dry ditches only. In some other countries, such as Denmark and Germany, there is already a complete ban on the use of pesticides for these purposes. Such a ban is also under consideration in the Netherlands.

Codes of good agricultural practice have been elaborated in some European countries to reduce water pollution by fertilizers and pesticides. They serve as a new form of direct advice to farmers with emphasis on fertilizer use, plant cultivation, reduction in soil erosion and the revised draft guidelines on the prevention and control of water pollution from fertilizers and pesticides will assist ECE governments in implementing plans, practices and other measures. Agricultural policies should be promoted to combine the application of strict legal and regulatory measures and appropriate economic instruments.

With respect to non-point sources of pollution, governments have a tendency to concentrate upon agriculture which leads to the most severe pollution and place minimal attention upon other sources of pollution. Guidelines for agriculture have been adequately defined and it is necessary to strictly enforce them. The situation regarding the other sources of pollution is far less clear. Much more work remains to be done on detecting leakages of polluting substances from existing and disused underground storage sites and from abandoned waste disposal sites. Work should be undertaken to examine existing technology for lead detection and for the development of new technology. Technical measures should be evaluated for the prevention and effective containment of accidental spillage from highways, railways and during pipeline transportation. Cost effective rehabilitation measures are needed to prevent groundwater pollution from the rehabilitation of abandoned military sites. In furtherance of the need to promote the convergence of national policies and strategies to prevent and control groundwater pollution, and as an initial endeavor, ECE organized a seminar on this subject in Madrid, Spain from 11/15 September 1995. In addition.to providing a platform to share experiences on chemical storage facilities and waste disposal sites. the participants also focused their attention upon the decommissioning of industrial and military sites. This subject is of increasing concern as the process of dismantling military sites proceeds and the effects of pollution become widely disseminated to the public at large. The immensity of future problems is illustrated by the simple fact that the Federal Republic of Germany a surface of approximately 1 million ha had been used for military purposes up to 1990. The dismantling of military sites is of increasing concern throughout developed and developing countries. Guidelines needed to provide advise on such matters as the establishment of inventories of old production sites and other contaminated areas, the detailed evaluation of areas polluted by hazardous substances, and setting priorities for rehabilitation. Another serious problem is saltwater intrusion from over-

exploitation of aquifers and attention should be directed towards the conjunctive use of groundwater and surface water.

Contingency planning

While most industrial accidents that could potentially adversely affect water quality can be contained within the boundaries of the industrial plant, there are cases where impact extends beyond these boundaries and has adverse effects, both short-term and long-term, on life, life-support systems including water, or property. Groundwater pollution has severe consequence and ever-increasing attention is being given to the operation and monitoring of chemical storage facilities and waste/disposal sites.

Contingency planning is most important in view of the apparent degree of unpreparedness at local, national and international levels. With respect to industrial accidents one is fortunate to have the ECE Convention on the Transboundary Effects of Industrial Accidents. This Convention provides the necessary mechanism to strengthen cooperation at the regional level to strive for consistency, set up joint contingency plans and harmonize relevant procedures, particularly in a transboundary context. In contrast, the Water Convention does not go into much detail regarding emergency preparedness and contingency planning. However, in a number of European countries, water act or accidents ordinances have introduced a system of preventive action, directly related to facilities, to avoid hazardous incidents and accidents. Owners of industrial facilities dealing with large quantities of hazardous substances are often required by law to meet certain safety standards. In particular, they must carry out risk analysis, implement monitoring and control systems and plan detailed emergency measures. Individual plans have often to be approved by the provincial or local water inspectorate. Water-management authorities have to regularly check the status of such measures and the compliance with legal regulations. Contingency systems and guidelines for a safe drinking-water supply in the municipalities are also being developed.

Economic and financial instruments

Economic and financial instruments are widely used in European countries as a complement to other policy instruments. Their basic objective is to ensure the appropriate pricing of water resources and water-related services in order to promote an efficient use and allocation of these resources. Charges, levies and fees for abstractions and discharges are intended to promote both the rational use of water and the control of pollution in accordance with the polluter-pays principle.

The most common and prevalent economic measure to control and reduce pollution is the principle that the polluters must pay for pollution. This principle has been adopted, with varying degrees of success, by all ECE countries. As one would expect the method of determining taxes and use of such revenues varies from country to country. The differences in rates of taxation and ultimate use of revenue greatly determine the effectiveness of the polluter pays principle.

In order for taxes to be an effective incentive against pollution, penalties must be set at high enough levels to make it costly to continue the ways of the past. From a technological point it is not difficult to determine pollution limits which must not be exceeded and the tax should be greater than the treatment cost. As an example, the Government of Croatia is well aware of the need of the level of taxes necessary to control pollution. However, due to the present situation and state of industry, they had to set a fairly low level of tax of some DM 0.16 for each cubic metre of waste water. In this particular case, the general economic conditions of the country prevent the application of an effective polluter- pays policy. The ability to enforce tax levies is also of paramount importance. In Hungary the law states that noncompliance by dischargers can lead to the cessation of activity, however, this has happened in very few cases.

An important element in economic policy is how the funds collected from polluters are utilized. Funds may either be utilized to control pollution and improve the environment or for general expenses of the government. While the Croatian government collects limited taxes, all revenues do go to the Croatian water management authorities and must be used for waste water management purposes. In France pollution charges are collected by the Water Agency and can only be used for measures such as subsidies for pollution control measures and the restoration of the quality of inland waters. In contrast, the Government of Slovenia's policy is that revenue from taxes and charges are transferred to the general state budget.

Sustainable water management

In this context, the objectives of water management are broadened to cover the utilization and development of water resources in an efficient, environmentally sound, equitable and reasonable manner in order to satisfy society's demand for water, water-related goods and services, as well as to safeguard the ecological functions of water resources. Specific policy instruments applied in Europe to promote sustainable water management include environmental impact assessment, integrated planning and the application of the ecosystem approach.

Proposed activities in a catchment area that could adversely affect the conditions of aquatic ecosystems in terms of water quality and quantity, biological communities and the integrity of aquatic ecosystems, are already subject to an environmental impact assessment (EIA) in some European countries. Frequently, EIA is required for such water-related investments as hydropower projects, dock constructions and large dredging activities. Other examples include the establishment, removal or substantial modification of a water body or its banks and the construction of dykes and dams; the expansion, construction or removal of a federal waterway; and the construction and operation or the substantial modification of waste-water facilities with a certain minimum capacity. Water abstraction is also subject to an EIA in some countries, if the intake is on transboundary waters or water is abstracted in significant amounts from other groundwaters and surface waters. Non-water-management activities which may have an adverse impact on water resources are also subject to an EIA in some countries. These include, for example, the construction of oil and gas pipelines, opencast mining and sludge-storage areas.

The integrated planning of water resources seeks to include socio-economic,

environmental and technical aspects into a decision-making framework. This how it can take into account all short-term and log-term needs and effects, ensure users' interests while maintaining ecosystem integrity and biological diversity, and find an appropriate balance between conflicting interests, on the national and transboundary level. The ecosystem approach to water management is essential for achieving and maintaining sustainability. It takes a broad, holistic view of the interaction among physical, chemical and biological components within a catchment area. The ecosystem approach covers the entire system comprising water, land, air, flora and fauna.

The entire subject of sustainable water and integrated water resources management needs much greater elaboration. There are indeed major policy decisions needed to be undertaken to bring these concepts to reality. Integrated water resources management involves a multi-sectoral approach taking into account not only water resources but also economic and social sectors of economies. Alternative uses of water have direct consequences upon a multitude of sectors and integrated water resources management involves determining the relationships between the sectors. The very concept of integrated water resources management involves determining the relationships between the sectors. The very concept of integrated water resources management implies a significant contribution in terms of capital and human resources and the development of a model to quantify results. The successful application of integrated water resources management necessitates accessibility to an extensive data base and the development of a macro-economic model. The model should present planners with an array of outputs based upon different scenarios. In order to demonstrate inputs and complexity of such a task it is suggested that a pilot project be undertaken which could serve as a guideline to methodology and application of integrated water resource management. What is important is the development of the methodology, which then could be applied throughout the ECE countries.
