

RECOMMENDATIONS TO ECE GOVERNMENTS ON WATER MANAGEMENT SYSTEMS

Prepared by the Seminar on Water Management Systems, held in Bratislava (Czechoslovakia) in 1986, and endorsed by the Committee on Water Problems at its eighteenth session

In order to meet the requirements of economic development, social well-being and the protection of the natural environment, advanced methods are needed for management of the natural hydrological régimes, taking into account their interrelationship with other sectors of land development. Water-management systems are structures or other elements within a river basin which influence the hydrological régimes and depend upon them. They have proven to be efficient tools for identifying and implementing objectives, including priority-setting, co-ordination, functional interrelationships and optimization.

The following recommendations were therefore formulated:

1. The rational use and effective protection of water resources as an important basis of national water-management policies has been promoted in most ECE countries. Although significant progress has been achieved by incorporating this attitude into the design of water-management systems, further effort should be made to accelerate the application of modern methods of design and operation of water-resources' systems. Governments should therefore pursue policies aiming at the rational use of water in all branches of the national economy by all legal, administrative and economic provisions contributing to the avoidance of wastage or excessive losses of water.
2. As the problems of water quantity and quality are inseparable, both aspects should be taken into account in all decisions related to water-management systems.
3. In comparing alternatives to water-management systems' development, consideration should be given to the economic aspects of optimal use as well as to the protection of water resources as an integral part of all natural resources. Therefore, not

only the use of water resources but also water demands should be controlled in order to integrate water supply and demand into water-management systems.

4. The application of a system of economic instruments, such as subsidies, grants, fees, charges, fines, etc. should be considered as an essential stimulus to the rational operation of water-management systems. The joint and co-ordinated implementation of economic instruments, together with legal, administrative and technical measures, should stimulate various water users to control both pollution of water and wastage of water. In water deficit areas particularly, water users should be directed by administrative and economic instruments towards water use that accords with the requirements of efficient operation of water-management systems. Priorities should be set on water use during dry periods so as to minimize the overall loss to society.

5. Water-management systems should be designed with due regard to their integration into long-term plans, such as land-development plans and water master plans. Medium-term planning should allow for changes in objectives or verification of whether they are still valid. The introduction of formalized and flexible up-dating procedures using the best available technical means, such as mathematical models and computers, is therefore indispensable.

6. It should be ensured that the administrative authorities competent for land development and water-management as well as all other planning bodies co-operate closely on all planning levels at an early stage. This will help to overcome difficulties arising from the different boundaries of the sectoral planning areas.

7. It is recommended to inform the public already at an early stage about relevant facts concerning water-management systems' development. This is important for the final decision-making on the design and implementation of such water-management systems.

8. It is recommended that the design and operation of water-management systems should encompass river basins and that, when appropriate, special authorities for the management of these systems within the basins should be established, taking into

account their interrelationship with the competent administrative organs.

9. In the development of water-management systems, due attention should be paid to methods and means based on advanced technological research, where appropriate, available mathematical models should be used and recommendations given as to their application at various operational levels. Climatic variations, in particular possible changes in mean temperature and in the frequency of extreme events as well as changes in water quality, should be duly reflected in the modelling and design of water-management systems.

10. Land development and planning of water-management systems should aim at the well-being of the public. This means that, in addition to the subjective well-being of the people affected, preservation of the natural environment should always constitute an important goal on which to base plans.

11. Land development planning should play a co-ordinating role for all land-use activities. Particular importance should be given at the earliest possible stage to the environmental-impact aspects of all planning, including planning concerning water-management.

12. The impacts of water-management systems on flora, fauna and their habitats should be identified at the design stage and in any decision involving land development. Appraisal of possible negative influences should enhance nature protection. In this respect, land-development regulations and legislation concerning the protection of flora, fauna and natural ecosystems should restrict human influence on wetlands and moor areas in order to protect and conserve these vulnerable sites if they are important for water resources and their existing genetic resources.

13. Legislation should provide that water management considerations be taken into account in land-use planning control. In addition, land-use planning should be the instrument for combining, co-ordinating and implementing all land requirements among the various planning sectors.

14. In areas of actual or potential water shortage or where water quality is particularly vulnerable, land development policies and plans should be prepared with due regard to these matters.

15. In areas designated or intended for agriculture which are sensitive for water resources, it may be desirable to give indications or guidelines for crop management either through informal guidance or through locally agreed plans.

16. Operational problems should be solved through the use of management tools adapted to the specific characteristics of the water-management systems, planning of appropriate control measures, such as centralized control, and a well-balanced choice of engineering facilities for data acquisition, transmission, storage and processing. Generalized data acquisition is necessary in order to improve accuracy and reliability.

17. The planning of important water management systems should be co-ordinated over a wide area in order to ensure optimal design but this should not inhibit the achievement of efficient operation and proper maintenance.

18. After the implementation of any water-management system, post-project-assessment procedures should include a number of activities which can be incorporated into the broader concept of post-project analysis. In this respect, relevant experience and information gained in post-project analysis as well as on the efficiency and implications of economic instruments should be considered as an important input in the decision-making processes regarding water-management systems.

19. In the case of transboundary effects of land development and water-management planning, the States concerned should inform each other, as appropriate, for good-neighbourly relations. In so doing, they should emphasize the co-ordination of important concerns before implementing practical measures. For this purpose neighbouring States should set up commissions holding regular meetings.

20. Water-management systems' design is a very complex and complicated task requiring an interdisciplinary approach, therefore, the curricula of universities should be adapted to the requirements of future designers, planners and decision-makers dealing with water-management systems. This would allow for adding specialists in the field of water-management systems to the staff of water-management bodies.