

RECOMMENDATIONS TO ECE GOVERNMENTS ON DRINKING WATER SUPPLY AND EFFLUENT DISPOSAL SYSTEMS

Prepared by the Seminar on Drinking Water Supply and Effluent Disposal Systems, held in Albufeira (Portugal) in 1982, and endorsed by the Committee on Water Problems at its fourteenth session

In the light of experience gained in the majority of ECE countries and on the basis of views exchanged at the Seminar on Drinking Water Supply and Effluent Disposal Systems held in Albufeira (Portugal) from 18 to 22 October 1982, it is recommended that Governments should apply the following principles taking into account specific regional conditions:

1. In rural and sparsely populated areas, public authorities should promote the application of legal and administrative instruments and mechanisms, such as technical guidelines, licensing, granting of subsidies, pricing systems, etc., in order to ensure satisfactory drinking water supply to all consumers, irrespective of the number of connected dwellings. These regulations should also cover any small water works operating at the local level. A decision as to the installation of a public supply grid versus individual water abstraction should be based on a thorough analysis of the respective construction and operating costs, as well as on the other advantages and disadvantages with regard to reliability of supply and safeguarding of public health.

2. In rural and sparsely populated areas, measures should be taken to reduce the cost of construction and operation of the sewer system, *inter alia*, through the use of alternative materials, low-cost technologies, energy-saving devices, prefabricated installations and modular structures. In zones of scattered rural settlements, engineering alternatives such as sewage transportation via forced-flow networks could be envisaged.

3. In view of the increasing capital and operational costs of wastewater transportation over long distances and in order to preserve the water balance, the choice between centralized and

decentralized sewage treatment plants should be based upon a cost-benefit analysis of each individual case.

4. The planning and, in certain cases, the construction of rural water utilities programmes are best co-ordinated by a central administrative authority which would ensure optimal design of the whole system. With regard to efficient operation and good maintenance, however, decentralization at the local or regional level seems to be the most appropriate solution.

5. In rural and sparsely populated areas, local support structures for the operation and maintenance of water supply systems and sewage collecting and treatment systems should be set up. Their functions should be to provide technical advice, training facilities and assistance in water-quality control to users; they might also keep a stock of spare parts for the various installations.

6. In sparsely populated areas, where the situation of small communities allows for the safe collection and treatment of effluents, individual sanitation methods should be considered. The development of individual sanitation in such areas should include information and training for the potential users and installation and maintenance should be supervised by the responsible authorities. Technical and financial public assistance may be granted as necessary. In deciding on these individual treatment facilities, all technical, environmental and economic factors should be carefully assessed.

7. Users living in rural and remote areas should be involved at an early stage in the planning and decision-making process with respect to improved or new services. In certain cases they may also play an active role in the construction of these services. To enable them to participate effectively in these various stages, adequate public information should be provided, ranging from health education to specific project-related information. Ideally, regulations should be adopted which provide a legal basis for public participation.

8. Authorities responsible for water supply should ensure that all the plants under their control are adequately maintained and that their performance is monitored. They should also, where that seems feasible or advantageous, envisage the creation of regional systems as a means of improving the reliability of water

supply and of safeguarding of public health. Where possible, the capacity of these regional water supply systems might be increased by building high-capacity pipelines and additional storage reservoirs, by connecting their supply networks and by interconnecting the regional systems.

9. The development and effective application of criteria for the selection of sites for recreational development should be promoted at the national and at the regional levels. These criteria should take duly into consideration the availability of a both quantitatively and qualitatively adequate water supply, the possibility of disposing safely of the corresponding amount of waste water and the environmental impacts of the proposed projects.

10. Whenever new developments are planned along the seashore, due attention should be given, at an early stage, to the sensitivity of the coastal ecosystems to future discharges of pollutants. In particular, a balance should be sought between the direct economic benefits of increased tourist inflows and the long-term effects on fragile coastal ecosystems especially in conchological zones. It may be of help, at the planning stage, to include ecological mapping of the region among the tools to be used in the decision-making process.

11. In evaluating the potential benefits of any tourist development project, special care should be taken to assess also the possible adverse effects on the environment and, in particular, to balance the economic advantages against pollution hazards to surface water and ground water. No new development project should be undertaken without prior cost-benefit analysis covering, *inter alia*, all aspects related to investment, operation and maintenance, environmental impacts and long-term effects, both positive and negative, at the local and regional levels.

12. In recreational areas, care should be taken to develop the sewer network and the sewage treatment facilities in parallel with the water supply systems. The most appropriate level of treatment should be determined in the overall context of the basin or sub-basin receiving the effluents.

13. In recreational areas, whether coastal or inland, a uniform method for the classification of the quality of recipient water bodies should be adapted, in particular, to the needs of bathing

and other uses of natural waters, so as to afford the best possible projection of human health.

14. In deciding on the future development of recreational areas, especially along the coast and along inland lakes, the needs and desires of the local inhabitants should be taken fully into account. This entails, inter alia, the formulation of alternative solutions; giving the public knowledge of the essential choices; the organization of polls, surveys and referenda; and the development of new educational processes.

15. In water management, the implementation of conservation programmes in recreational areas should be promoted with the active support of the various users, especially when and where water resources are scarce. Such programmes might include various incentives - such as pricing policies and water metering - for consumers, particularly those who are at the origin of seasonal fluctuations, to use water more rationally, as well as measures aiming at water conservation. Possibilities in this respect include the use of clock-controlled taps in public buildings and of water-saving devices and the recycling of water for irrigation purposes.

16. Renovation programmes for old town centres should include, at the earliest stage in the planning process, provision for renewal of individual and collective water supply and sewage collecting systems. Where appropriate, grants, subsidies or preferential tariffs should be provided for categories of users who have invested in improved sanitation of old buildings. An appropriate mechanism for the control of the water supply and sewage collection networks should be established in order to detect and reduce leakages.

17. Priorities set in national policies should consider expansion of existing infrastructure of supply and sanitation to cover the total population or to favour the renewal and/or rehabilitation of existing infrastructures. When financial resources are limited, the return of investment for either of these options should be a decisive factor in decision making. Benefit to society received from expansion may be less than that from renovation. This may even be more valid taking into account that a system is to be handed over to future generations in a state which is at least as good as the one in which we inherited it.

18. Because of their strong influence on environmental pollution, special attention should be given to sewage and stormwater collection systems. In order to improve this situation, it is necessary to regard sewage systems and treatment plants as forming a package.

19. Renewal of the infrastructure in old town centres should be carried out without causing undue disturbance for the population and without affecting commercial activities. Appropriate construction techniques which allow for rapid execution of the necessary works and careful planning and timing of the operations are of primary importance in this respect.

20. Great attention should be given to operational, economic and hygienic problems associated with leaking supply and sewage systems. Examples show that water losses from drinking water supply grids sometimes even amount to more than half of the total supply, with considerable impact on the economy of the system. In this respect, consideration should be given to potential health hazards especially when sewers laid in the same trench as water supply pipes are leaking. Any measures that might help to lengthen the life-span of new or of existing pipes should be applied. In this respect, it is advisable to promote monitoring so as to gain better information on the extent of defects in networks. In addition, research should be undertaken in order to develop new techniques and materials for increasing the life-span of pipes.

21. In old town centres and other densely populated areas, the public should be involved in any programme aiming at the improvement or renewal of water distribution networks and sewage systems. The presence of a motivated public which is fully aware of the problems to be solved will ensure easier acceptance of possible negative side-effects and thus further the elaboration of solutions consistent with the specific characteristics of each neighbourhood. All works decided upon should take into account the presentation of the cultural heritage that old town centres represent.

22. As a complement to the renewal of water supply pipelines in densely populated areas or, in certain cases, in order that renewal may be deferred, consideration should be given to constructing a ring main parallel to the existing grid. Such a ring joining the major storage reservoirs or water treatment plants to

the major centres of demand would considerably augment the capacity of the distribution network.

23. Low-cost and appropriate technologies should be adopted wherever possible in order to economize energy and to take full advantage of local climatic and environmental conditions. Re-use and multiple-purpose use of water, utilization of sludge and recovery of valuable by-products contained in waste water are important points to be considered. One possibility in this respect is to employ dual supply systems where fresh water of good quality is scarce.

24. Priority should be given to research at the national and international levels on questions related to the safe supply of drinking water, the proper disposal of effluents and the possible re-use of sludge. This research should be multi-disciplinary and should include, apart from water managers, also specialists on land-use planning, tourism, geography, sociology, and sanitary and environmental engineering. The following topics in particular might be studied:

- (a) Performance of small-scale sewage treatment facilities;
- (b) Survey of small ground water deposits and their characteristics;
- (c) Methodologies for cost-benefit analysis adapted to renovation programmes in old town centres;
- (d) Methods and experience in post-project evaluation of drinking water supply and sewage collection and treatment systems.