

HUNGARY



1. OVERVIEW OF NATIONAL POLICIES AND DEVELOPMENT PLANS

- The processes and decisions in water management are influenced by a number of governmental and non-governmental institutions in Hungary. The laws on water management, environmental protection and regional policy, together with subsequent acts of legislation create the basis of harmonization, although some legal and other criteria of implementation are still unclear.
- Water policy making has long traditions in Hungary. However, the changes in political regime, restructuring of economy and the shift to market economy, further the requirements of sustainable development made new approaches to water policy formulation necessary.
- The new water policy of Hungary has been shaped during the recent years. One of the most important objectives of the new water management policy is to upgrade the surface- and subsurface waters to the status defined in the EU directives, which will require development efforts much greater than the present ones in the domain of water management.
- Water management planning - and catchment development planning as part thereof - have long traditions in Hungary. New features of recently started catchment management planning are the preparation of a consultation plan and the requirement of taking account of market economy conditions and ecosystems.
- River Basin Management plans have been proposed for 33 area units (river basins) in Hungary. These river basins conform to the boundaries of the catchments drained by the streams and canals. The particular water management conditions in Hungary are

characterized by the fact that over one-half of the 33 area units are in river basins of which a major part extends to the territory of a neighbouring country.

- Notwithstanding the recompensation and privatisation following the political change in the year 1990, being considered practically completed, the Hungarian agriculture is still in transition from several points of view. The estate structure and farm constitution resulting from large-scale changes in the property relations are ambiguous; their further changes can surely be expected.

1. PRESENT STATUS OF WATER

- Water has always played a decisive role in the life of the Hungarian people, which prompted the early development of a hydrographic observation and data processing network. Readings on the Danube river gauge at Budapest have been taken regularly since 1823. The national hydrographic observation network was established in 1886, the results of which have been presented since 1895 in uninterrupted sequence of Hydrographic Yearbooks (from 1998 also on CD-ROM).
- Over the past 150 years, human activities had a significant impact on runoff conditions in Hungary. Cuts have shortened the course of the River Tisza by close to 500 kilometers. Embankments have prevented river floods from spreading annually to one-fourth of the country, while from another one-fourth the excess runoff is drained by means of artificial facilities. Without these measures one-half of lands would be inundated periodically or permanently.
- Over large parts of the country, the runoff coefficient is very low, its magnitude depending in many places on the capacity and operation of the artificial drainage facilities. Dry and wet periods alternate. In areas, where the abundance of water has caused problems for several years, droughts have caused heavy losses subsequently. The low runoff coefficient has water quality impacts as well (less water will wash less pollutants from the catchment).
- General water quality along the Hungarian section of the major streams is classified satisfactory.
- The groundwaters close to the surface are polluted. The bank filtered- and karst waters, and the waters stored in deeper aquifers are still generally of good quality. An ambitious action program is being implemented for the protection of developed and potentially vulnerable future sources of supply.
- The overall conclusion arrived at from the foregoing is that the surface and subsurface water resources in Hungary are large enough on the long-term average to meet the demands as regards both quantity and quality.
- The magnitude of the surface water resources is determined by the fact that 95 per cent thereof originate abroad and that reservoirs have been built beyond the borders. The demands for surface water arising in Hungary, especially those in the Tisza Valley, can be met by water routing and transfers alone. Considerable efforts have been made at ensuring the desired level of supply to the large lakes, even by drawing on groundwater resources.
- The supplementary water resources needed to control eutrophication are often absent, river training works to accelerate flow are often omitted, or limited in their extent because of the very high costs involved.
- Disregarding a few parts with unfavourable hydrogeological conditions in the country, groundwater resources are available in volumes sufficiently large to meet the demands. Major drops in the water table in the surroundings of high-rate abstractions are evidences of water uses surpassing the rate of recharge, for controlling which legal measures must be introduced. Groundwater quality varies with the depth of the aquifers, but can be upgraded to drinking standards by simple treatment methods.

- Growing vulnerability of the sources of supply and the trends detectable in the records imply, however, that owing to pollution of communal, industrial and agricultural origin, the quality of groundwaters has deteriorated in recent years. With the aim of controlling groundwater pollution, a government program was launched in 1993 to protect the sources of supply.
- The water resources available almost everywhere in Hungary are large enough to meet the water demands. The majority of the problems and difficulties encountered in meeting the needs of society for water are associated with quality. Over 95 per cent of the surface water resources originate abroad, making both quantity and quality management difficult, in that the methods of international water management must be resorted to. The normally good relations of Hungary with her neighbours in water affairs have contributed to settling such problems.
- The water demands of agriculture, power generation and industry can generally be met presently. In the absence of medium- and long-term development plans in the various sectors of economy, the future demands are difficult to quantify. Recent economic difficulties of the users have discouraged water consumption considerably in agriculture and industry alike. Efforts must be made at reorganizing and developing agriculture and industry in a manner that is compatible with the needs of ecology. Limitations must be imposed on unauthorized irrigation abstractions from groundwater on the Danube-Tisza Divide.
- Ecological water demands and uses are relatively new in Hungary, though considerable efforts have been made over long years to provide compensation water of the required quantity and quality to water bodies suited to recreation uses.
- Water related activities and the legal regulation thereof have long traditions in Hungary. By subjecting all water uses (abstractions and discharge into a natural recipient water body) to a permit, the regulation is a comprehensive one.
- The water and environmental authorities are involved in the procedure as professional authorities.
- The sharing of authority functions within the sphere of water management among the water authorities and the community self-governments means at the same time the completeness of function performance in the fields of water abstraction, water supply and other water management activities.
- Cottage industries have been started all over the country, the operation of which is impossible to control and which discharge potentially hazardous substances into waters.
- Striving for higher profits, the newly founded industries pay little attention to minimizing the risks to the environment.
- Farming operations have applied fertilizers at rates considerably higher than necessary. The excess has accumulated in the soil and is now washed into the surface water bodies by erosion.
- Several industrialized animal farms dispose of the liquid manure produced in an unsatisfactory manner, causing soil and groundwater pollution.
- Ownership rights in agriculture are unclear in a number of places. The water management associations have no information on several owners of property in their area. Drainage and irrigation of the lands split up into small holdings are unsolved.
- Many of the new landowners have no farming experience and their farm water management awareness is inadequate to serve as a groundwork of farm water management based on ecological systems.
- Organized tourism is not truly concerned with the preservation of ecological values. Therefore the unorganized, spontaneous type of tourism is liable to cause considerable harm to the aquatic environment. "Public access" to several water bodies is unregulated.
- Water provision is ensured by the 1.401 km long irrigation and 3.142 km long double-use canals owned by the state and managed by the district water authorities.

- Close to one-fourth of the country's territory is exposed to flood hazards. In the protected flood plains 2.5 million people live in over 700 communities. Flood control to these areas is provided by levees of 4.220 km total length, of which only 58 per cent have dimensions complying with the provisions presently in force. Another cause of concern is that in recent years lack of funding has prevented maintenance work on the embankments, as a consequence of which even the safety of those having adequate dimensions has become questionable.
- Close to one-half of the country's territory consists of lowlands, which have no natural drainage, and from which the accumulating snowmelt and storm runoff must be removed by artificial measures.
- Of the small streams in Hungary, sections of 5.300 km total length are maintained by the state water agencies, while water management associations and the local self governments are responsible for maintaining 21.100 km thereof.
- The most important tasks in the domain of controlling water related losses include performance of the outstanding maintenance works, clarifying the ownership conditions, upgrading the riparian landscapes and erosion control.

3. PRESENT STATUS OF FOOD

3.1 LAND RESOURCES AND LAND USE

- In Hungary the arable land exceeds 6 million hectares, from which the grassland (meadows and pastures) is 1,5-2 million hectares.
- In plant production both super-intensive, intensive, general and extensive forms of farming exist. Considerable part of the average yields, especially the cereals are higher than the world average.
- Irrigated fields exceed 130.000 hectares which is half of the area equipped for irrigation.
- On the 95 percent of the cultivated land is rain-fed, which provide sufficient income to the farmers even in years with average precipitation.
- On forested river-banks water tolerant and water requiring tree species (willow, alder, poplar) can be found. Sometimes can be met with orchards, where plums and walnuts are frequent.
- In some areas which experience drought frequently, suffer heavy losses in production.
- The most characteristic climatic effect is between semi-arid and semi-humid. Humid type weather appears only on small area on the western part of the country, near to the Alps. From 10 years 4 is droughty, but in 3 years excessive precipitation causes over-abundant situation. It is typical that on the same area - especially on the Great Hungarian Plain – may be drought-stricken in one year but in other years suffer from floods and/or inland water surplus. Therefore there are watercourses established for „double-use“ (used for irrigation and also for drainage).
- Because of the basin type situation of the country the protection of arable soil is very important. During floods mainly grassland areas are used as emergency reservoirs.
- In the surrounding of bigger and permanent reservoirs the seepage water can be found near to the surface depending on the water level in the storage basin. Water logging and acidification occur in soils under periodic inundation. The same symptom was noticed in the 70s and 80s caused partly by the overdosage of fertilizers, too.

3.2 AGRONOMIC FACTORS, PRODUCTIVITY

- A very large proportion of the land of the country is good for agricultural production. Majority of the soils are suitable for the successful production of the most important plants used for food or fodder.

3.3 CROPS GROWN

- Cereals has prominent role in arable production. The greatest sowing area belongs to the winter wheat and corn, perennial crops are grown for forage (e.g. perennial papilionaceae) or for seed-grain (e.g. rape). On the arable land, the cultivation of sunflower and sugar beet is also significant.
- Among the fruits apple and drupes (peach, apricot, plum, cherry, sour-cherry) are important, but the berry-fruits are also grown.
- In the intensive orchards micro-irrigation methods are used. Recently the use of fertigation is also increasing.
- Among the plantations the vineyards and apple orchards are most important. However - after the collapse of the soviet market - grape growing and vine production has declined. The development strategy can now be the switch-over from quantity production to quality one. Especially on hilly areas the new vine-cellars are producing good quality vine which have attained world wide popularity.
- Forests cover 18 percent of the total area, composition of which is on the plain mainly acacia, poplar and black pine, on the mountains different deciduous trees.
- Fish husbandry has been introduced to revive dead channels, lakes and reservoirs. Special fish ponds have been established for this purpose.
- Some changes in land use will be made: about 20 percent of the present arable land will be converted to grassland and forest.
- Among horticultural plants mainly the growing of vegetables will increase.
- The use of artificial fertilizers declined to the tenth of the amount in 1985 only. Mostly livestock manure is used for organic fertilization, beneficial effects of which are effective through the increasing of biological activity and water retention capacity of the soils.
- The use of plant protective herbicides and pesticides is also declining, but not in as dramatic way as in the case of fertilizers.
- Food supply in Hungary is excellent. Except for tropical fruits, everything can be grown in the country. There are more offers than requirements. In nutrition, carbohydrates and fats are dominant, while the consumption is lower than desirable in case of vitamin-rich vegetables and fruit. The habits of the former rural life and diet are changing rather slowly.

3.4 IMPORT-EXPORT

- The import of foodstuffs does not exceed 10 percent of the total consumption.
- In food export mainly the raw products (wheat grain, fruits, etc) are determinant. The volume of former agrarian export has decreased to the half size. The consequence of this is the 10-12 percent increase of unemployment from agricultural sector, and about the same coming from the industry.
- Security of the food storage is solved, the scale of quality degradation is low.

4. PRESENT STATUS OF RURAL DEVELOPMENT

- The direct state functions comprise the construction, maintenance and operation of the transfer and regional projects, which create the infrastructure in particular areas for farm irrigation developments by ensuring water for, and conveying it to, the irrigation sections. Farm irrigation development is beyond the sphere of the state functions. Such projects are implemented by associations, the collective efforts of interested farming operations, or with financing by an economic corporation. State support to such projects may be granted on an application basis. The emergence of small farms is likely to increase area irrigated from

groundwater abstracted from shallow, dug wells. The small groundwater volumes abstracted by the individual farmers may in combination affect adversely the subsurface supplies within a brief period of time.

- The merits of the Hungarian water law include the simple, clear structure, the accurate allocation of functions and responsibilities (state, self-government, water user) and the unambiguous identification of ownership (exclusive state property, state property, self-government- and private property) covering all projects and waters. The distinction between operating functions emerging from ownership responsibility and administration functions emerging from state responsibility is also considered among the particular features.
- Legal regulation of water related activities has long traditions in Hungary. The first water law entered into force in 1885, the second in 1964, while the third in 1996. A permit was required for any water management activity since 1885. These permits have been registered ever since in the Water Book. The water laws represented advanced legal instruments in their time and this is why they remained in force for extended periods of time. Water pollution was prohibited by the law of 1885 already. The water laws have always responded to the felt necessities of society, economy and politics of a particular period. Comprehensive legislation on water pollution control was accordingly introduced as late as 1964.
- Enactment of the water management law in 1995 was prompted by a number of circumstances, including the change in political and economic regime, privatization, the transition to a market economy and harmonization with the EU. Water management is presently regulated by a host of laws, law decrees and standard specifications, of which the laws on water management, environmental protection, nature conservation, regional development and forestry are the salient ones. In the formulation of these laws account has already been taken of the conditions of a market economy and of the requirements of harmonization with the EU.
- A comprehensive legal framework of water resources management, environmental protection and water pollution control had been developed in Hungary, but the implementation thereof was ineffective.
- One of the outstanding present goals of water management is - with special regard to integration with the EU - to meet the water demands arising in the sectors of economy while complying with the requirements of ecological quality. This goal is apparently in conflict with the basic principles of profit-oriented market economy, the actors of which must realize that this is the only possible way of development.
- The environment-oriented approach is, for instance, reflected by the obligation of the buyer to remedy the environmental harms caused during the former operation of a privatized company. The same applies to the identified polluters of water and soil.
- The discontinuation of subsidies had a profound impact on water management. One of the important tasks of water management is the application of non-structural methods, the perfection, introduction and implementation of legal and market oriented regulatory measures.
- Water management education has a well developed background in Hungary. Major problems have been encountered in recent years on account of the meagre budget appropriations for such purposes. At the same time, broadening international relations and opportunities for students and young professors to study abroad have played a significant role since the early '90s. New types of university and continued education (for instance training water- and environmental managers) have contributed to the development of water management.

5. FUTURE SCENARIOS AND AIMS

- Effective water management needs the integration with the economy, with the environmental and nature protection, with regional development, and with social movements.

- Our aim is to create such a situation in which the international cooperation in water management could be raised to a higher level either in the use of water resources or in the conservation and improvement of their quality, or in the increasing of safety in flood control.
- For the future, on-going governmental programs must provide for the protection of drinking water resources, for water caused damages, and sewage treatment as high priorities. There is welcome trend toward construction of lakes and small reservoirs. Considerable problems have resulted on the Danube-Tisza-table-land region by the rapid lowering of the water-table, the solution of which and the attainment of the water recovery in this region directly influences the life, subsistence, and future of 250.000 people living there.
- In water management, the further clarification regarding division of responsibility between the owners and participants is to be expected; government will properly finance the maintenance of the state-owned main constructions, while the financing of the not state owned projects will be solved by the new owners (local authorities, communities, companies, associations, private owners).
- The measure as well as the danger of water pollution originating from agricultural activities will decrease mainly because of the use of environment friendly technologies. By the development and conscious utilization of the drought mitigation strategy new plant production alternatives will be introduced into the practice for the reduction of water scarcity. On the irrigated fields intelligent automatic systems will provide the full water- and nutrient requirement of the plants during their whole vegetation period. On the irrigated fields the drought sensitivity of the present farming methods will decrease about 50 percent by the wide use of precision irrigation techniques and water saving methods, and in the proper operation of irrigation equipment the prediction- and extension training services of the INTERNET will play a considerable role.
- In Hungary water will be treated as an economic good instead of a social good, therefore its price will be determined basically - and rather in the future - according to its market value; this hopefully will considerably influence the use of the water saving methods increase awareness about the importance of water.
- Besides meeting the traditional water demands, special demands (e.g., those related to ecology, recreation, landscape aesthetics, a pleasing environment, etc.) will require greater attention in the future.

6. CHALLENGES FOR THE FUTURE

- One of the most comprehensive current programs of Hungarian economy and society is the preparation for integration with the EU, under which a number of major problems await solution, also in the domain of water management.
- A broad spectrum of instruments have been applied in Hungary to promote integration. The new type of country-wide river basin management planning started recently and scheduled for completion within a few years is expected to become an effective tool thereof. Along with planning, the recent legislation on water management, environmental protection, nature conservation and regional development will also assist administration in realizing integration. Non-legislative instruments and market oriented regulatory measures may also provide powerful incentives towards integration.
- In the context of the uses of natural waters mention must be made of the work to be started in the near future, on surveying and development planning of the river basins, which would consider quantity and quality of all types of water resource in the catchment and aim to provide an optimal answer to potential water demands.
- Growing ecological water demands will have to be anticipated, but these must be met from surface water resources.
- Over the next decades, the main concern in Hungary will be to supply water of the desired quality to the consumers, the quantity demands will be met readily. The water rates will be

proportional to the costs and will therefore be high. The population will be encouraged to economize on water, so that no major increase in domestic demand is expected. Owing to the high costs of water supply and waste water treatment, industry is also expected to introduce water saving and clean technologies. Farmers will resort to irrigation for growing high-value crops only, in the absence of considerable state support irrigation will prove uneconomical. The demand for ecological water and water-side recreation is likely to grow appreciably. The latter will raise the ecological, leisure-time and aesthetic value of the water bodies, further the appreciation of the water-side cultural heritage.

- The first steps towards implementing the quality concept in water management have been made. The importance of quality awareness and “consumer-oriented“ attitude is emphasized at control and execution levels alike. Financial resources are sought for introducing the quality assurance and management systems in production and services, in this context for accrediting and notifying, the certifying and managing organizations, further for the comprehensive modernization of the technical regulatory framework.
- The main consideration in the development of the institutional background of water management in Hungary over the next decade will be the harmonization of policies with the EU.
- The chances of the present upward trend in industry and agriculture to proceed along the principles of sustainable development are good, but the risk of owners concentrating on profits alone and neglecting environmental requirements is also great. Under the changed set of conditions the water- and environmental administrations will have to play important roles in ensuring environment - compatible, sustainable development by a carefully elaborated and enforced complex of regulatory measures.
- Environmentalist movements have grown vigorous and general public awareness of water- and environment related issues has also evolved. These may offer guarantees for the realization of ecosystems-oriented water management, while meeting the water demands of the various sectors of economy.
- The water resources of Hungary, both on and below the surface, are characterized by the broad spectrum of their potential uses. Water uses being of concern to all actors in the social and economic sphere, at the same time the abstractions and water uses interacting with each other, strong legislative regulation is necessary, to make access to water resources a citizen’s right to everybody.
- In the early ‘90s (following the regime change) Hungary has embarked upon an ambitious program of legislation under which the law on water management has also been adopted. The laws most relevant to the subject under consideration are those on water management, environmental protection, nature conservation and regional development. Besides enforcement the new laws and other legal measures, compliance with these must be ensured. Advanced legal measures have existed formerly on water management and on the protection of the aquatic environment in Hungary, but these were not enforced satisfactorily.
- Public awareness of water and environmental protection issues has grown appreciably in recent years, but have not become truly effective. Owing to the economic depression, problems other than pollution control and environmental protection were of concern to the population.
- One of the most important methods of conflict resolution is the involvement of the public into the processes of decisions making. This has been recognized already, though the mechanisms of effective public participation and conflict handling have found no widespread application yet.
- It has not been realized still that the involvement of the public in decision making is an expensive exercise, yet the results offset the efforts and costs thereof.
- Several new legal institutions have been introduced in Hungarian legislation, including the establishment of a public consultative body and forum to promote the balanced development

of water resources and to prepare strategic decisions in the prevention of water damages. Public involvement in water management decision making is thus made possible. The provisions on the operation of public water utilities, on the methods thereof, including the possibility of concession arrangements, are also advanced features of the law.

- The environmentalist groups have still considerable influence on the public and the successive governments in Hungary. Some environmentalist organizations have played unquestionably important roles in protecting the aquatic environment and ecosystems. At the same time extreme views have been voiced and in some government orders on the aquatic environment, political, rather than environmental or water resources management considerations predominate.
- Reviewing the history of the past 15 years it is concluded that the professional in state water administration and water management in general have performed their functions correctly, keeping public interests in view, but have failed in recognizing in time the characteristics of the democratization process, have not involved the public into the decision making processes and have omitted image building in water management (PR work), which became the source of several problems. The public administration institutions, self governments and private companies operating in the field of water management conduct presently a successful public policy, take efforts at maintaining good relations with NGOs critical of water management activities. The institutional, legal forms of these relations are being developed.
- Traditionally good relations have existed in Hungary between the institutions of public water administration and the national and international professional and scientific organizations. Good examples of cooperation between the professional and scientific bodies can also be quoted. For example, the Hungarian representatives/officers of the international water management organizations re-convened annually under the auspices of the Hungarian Hydrological Society to coordinate their activities. They organize several joint events, or invite each other to their events. The international water management organizations provide also assistance in inter-governmental cooperation by identifying and analyzing problems, conflict situations and the potential solutions, promoting the avoidance, alleviation and solution of conflicts. They accelerate significantly European integration and harmonization. In professional and scientific fields (education, research-development) they make participation in the activities of the EU member states possible earlier than over the official channels of international politics. Examples thereof can already be mentioned, in that Hungarian professionals are actively involved in the activities of a number of European professional and scientific organizations and in the Central-East-European working groups thereof.
- Water management research is adversely affected by the fact that there are virtually no funds available for basic research and those of applied research-development are also very limited. Domestic and international research projects financed from international funds have beneficial effects. Special attention is called in this respect to the research projects under the Danube Environmental Program, in several of which teams from over ten countries are involved. This kind of scientific collaboration may open new perspectives in water management, in particular international river basin management.