

SLOVAK REPUBLIC



1. OVERVIEW OF THE NATIONAL POLICIES AND DEVELOPMENT PLANS

Slovakia's present period is an important landmark for the free market economy. Several years of decline in Slovakia's economic activity came to an end and revitalization in a stable macroeconomic environment begun. One of Slovakia's greatest natural resources is its agricultural and forested land, which accounts for 4.4 million hectares, 2.4 million of which is arable land suitable for agriculture. It is of immense national economic interest that the use of this natural resource be optimized.

Towards a solution to this situation, the government of the Slovak Republic adopted a whole range of one-time, as well as, long-term measures. The most significant step was the acceptance of the basic principles and objectives of an agrarian policy, approved by parliament in 1993. It is based on the principle of economically utilizing the potential of arable lands, productive and human resources for the production of food and raw materials, while fully respecting the ecology, protection of the land and preservation of rural habitation.

Water management provides necessary services for society, such as protecting the land from floods, supplying the population, industry and agriculture with use and drinking, water, as well as, the protection of surface and groundwater from pollution.

The present structure of water management organizations in the area of land management accounts for about 85% of all water management activities, whereas other activities such as the maintenance of waste water purification plants, water treatment plants and minor reservoirs come under the administration of other departments. This vision is important for operative interventions

and responses to crises, and also for 'the-decision-making, process concerning the priorities of financial and pricing, policy and the coordination of ultra-regional waterworks.

Within the structure of water management there are four water-basin enterprises under which authority are 24,500 km of flowing water, more than 6,000 km of drainage canals and 228 km of irrigation conduits. Water-basin companies also manage 260 reservoirs whose total volume comes to 1.8 billion square meters of water, and monitor water quality. These organizations are responsible for the administration of 18 waterworks that generate energy. They also maintain dams that protect over 5,000 km of land from the threat of floods.

From a hydrological standpoint, Slovakia is the "rooftop of Europe", with an uneven layout of its water sources. Every year, about 22 billion square meters of water flow out of Slovakia. up to 54% of all usable underground water comes from the Danubian Lowland and lower Vah, 27% is in Central Slovakia and 17% is in the east. There are ten regions in the Slovak Republic declared protected - water management regions with a total surface area of 7,000 km.

Running transformation and privatization in the area of water management enables Communities to realize their ability to solve the problems of drinking water supplies, canalization and purification of waste water, and to open the space for the investment of private capital.

The basic documents for implementation of the water management policy in Slovakia are :

- Program Declaration of Slovak Government
- Principles of water management policy in Slovak Republic
- Conception of water management policy in Slovak Republic
- General water management plan
- General schedule of protection and rational use of water in Slovak Republic

2. PRESENT STATE OF WATER MANAGEMENT

Surface water resources include watercourses, water reservoirs, lakes, ponds and transfer of water among, catchments. There flows about 3328 $\text{m}^3 \cdot \text{s}^{-1}$ of water in long term average (1930-1980) in total. From this amount only about 12 % (398 s^{-1}) rises on the Slovak territory. The rest flows from neighbouring countries, especially in river Danube. Minimal flows appear by the end of summer, in autumn and winter. In most of water courses significant imbalance of flow appears (rate of minimal and maximal flows) which considerably restricts economic water use. For example in the catchment of river Ipeľ is the rate from 1:2575 to 12 900, in catchment of river Vah from 1 : 109 to 487 and in river Danube from 1: 13,5 to 18.

In order to secure economical use of water and its energetic potential there have been (mostly after year 1945) 54 big water reservoirs constructed (with volume over 1 mil. m^3), which are able to catch about 14 % of long term average annual discharge from the area. Water reservoirs improve small flows during dry seasons by about 55,5 $\text{m}^3 \cdot \text{s}^{-1}$, So that total improved flow reaches approximately 145,8 $\text{m}^3 \cdot \text{s}^{-1}$. Besides above mentioned big water reservoirs there are approximately 300 small water reservoirs and ponds with total volume about 50 mil. m^3 .

Subsurface water resources include soil water and ground water resources. Average annual volume of soil water on agricultural land in the Slovak Republic has been calculated (under condition of depth 1 m and humidity 25 %) to be about 7.0 billion of m^3 . This water is important from the point of view of production stability.

Ground water resources located are very uneven. Those near big, urban centres, which have been used at present, are practically exhausted. Many problems appear also in utilization of many resources due to their low capacity, threatening by pollution, or big distance from places of consumption. The resources are supplied mostly by precipitation. Natural water resources are

calculated to 146,7 m³, while recorded usable resources make 74,1 m³. This amount is gradually decreasing due to observed decrease of capacity of both ground water resources and water courses. Further decrease is caused by prohibition of use due to pollution.

Supply water delivery: Development of surface water taking in the Slovak Republic is characterized by following data in mil. m³

Consumers	1990	1995	1996	1997
Public water mains	92,5	72,0	73,6	74,5
Agriculture	279,5	74,4	46,4	50,5
Industry. Power engineering	1018,1	661,8	701,7	685,6
Total	1390,1	808,2	821,7	810,6

Absolutely biggest decrease of water withdrawal has been recorded in user group "industry" including power engineering and other users. However, relatively biggest decrease appeared in water withdrawal for agriculture - water withdrawal in 1997 made only 20% from water taking in 1990.

Areas with water deficit especially for agriculture (comparing with theoretical requirements for irrigation) are lower sections of tributary flows of boundary rivers in southern part of Slovakia. In order to solve the deficit there have been proposed some measures - but they cannot be realized at present due to little water requirements and lack of finance.

Water courses and their use. Out of total water courses of length 49745 km., 32 632 km of are managed by the state public-profit enterprise - Slovak Water Management Enterprise. Its 4 branch works manage water economy, hydraulic structure and flood protection works in 4 most important river basins. Management in main river basins is executed with the help of water management systems; i.e. with the help of utilization of co-operation of natural flows, effects of water reservoirs, water transfers and water works. Besides that, part of small watercourses are managed by others like state forests, national parks, and other bodies. The Slovak Water Management Enterprise manages watercourses and constructions on them in a scope presented in Table 1.

Besides supplying the needs of water for all sectors, the hydraulic structures also provide necessary protection against flood as well as help navigation, facilitating production of energy and for leisure purposes, etc.

In order to increase agricultural production the irrigation systems have been constructed. During the period from 1960 to 1995, the irrigated area has increased from 25,000 ha to 308,200 ha. Irrigation works been constructed mostly in southern parts of the area, and in the East Slovak Lowlands. During the period 1971-1994 there was increase in irrigated area from 44,000 ha to 248,000 ha (in the year 1986) and the water withdrawal increased from 576 m³/ha to 1332 m³/ha in the year 1990.

Natural disasters on river flows (floods) arise due to extreme precipitation, long term precipitation and high water level in lowland sections of rivers, after sudden ice and snow melting, due to ice barriers, etc. Extreme floods appeared in the years 1954 and 1965 on river Danube, 1958 and 1960 on Vah, and repeating floods in the east Slovak Lowlands. Last floods in years 1996, 1997 and 1998 have arisen due to extremely intensive precipitation also in small catchments and caused significant damages. It has been confirmed, that on those river flows (Danube, Orava, Vah), where reservoirs with satisfactory accumulation volumes, and also other water works have been available were floods not hard, and damages not so high.

There appeared big, problems in lowland parts of river flows due to leaking of dikes. The problem of soil salinity is not important. Salt affected soils solonetz and solonchak appear only locally.

Potential of rivers is used also for electric power production in big and small power plants. Technically usable potential in realisable power plants represents average annual production of 6,608 GWh. In the year 1998 the production reached 4,630 GWh, and power of water power plants was increased to 2,487 MW. The water power plants covered 20 % of total electric energy consumption.

Fulfillment of water management tasks depend on investment and operation development. This development depends on financial securing. Delivery of drinking water, discharge of used water, and water treatment for inhabitants are realized by limited prices which don't take into account requirements of new investment over the sum of depreciation. Payments for rivers management don't include (respectively include only a part) of public profit activities connected with use of energetic potential, flood protection, maintenance of navigation course, etc.

3. PRESENT STATE OF FOOD PRODUCTION

While evaluating the present state of food production, the development of agriculture after 1990 must be taken into account when significant changes appeared.

In following 5 years, the share of agriculture on gross domestic product made 4,4 %, with trend of further decrease.

The present total area of agricultural land is 2 444 600 ha. From this amount the arable land makes 1 472 200 ha which is 60,2 %. Perennial grassland, i.e. meadows and pastures make 845 600 ha, orchards make 15 900 ha and gardens make 77 900 ha. Vineyards and hop gardens occupy 30 000 ha. Forest area is 1 993 366 ha, water surfaces 93 476 ha, grassland 196 143 ha, and other area 176 054 ha.

Under the irrigation and drainage programme, an area of 308,000 ha has been brought under irrigation, especially on the most fertile soil. However, potential need is 892,000 ha. Moreover, according to evaluation of possible consequences of climate change in the Slovak Republic, there appears necessity of re-evaluation of irrigation and drainage programme as a whole. Preliminary results show that potential demand of irrigation is 700,000 ha as minimum. The irrigation systems cover 20.8 % of arable land at present. The need of drainage was calculated in the framework of irrigation and drainage programme as 560 000 ha of agricultural land. At present is drainage realized on 460 000 ha. From this amount there is 4'30 000 ha of subsurface drainage, which is 82 % from total need of drainage.

Salt affected soils, which appear in Slovakia, occupy only a small area and they are not important for economy.

From the total area of agricultural land, 49 % of soil is productive and 2% not productive, even unsuitable for agricultural production.

The problem of agricultural production reflects a fact, that cereals and oil crops are the easiest marketable crops at present.

In the framework of total agricultural area, 50,000 ha of land are managed by a system of organic agriculture, which makes 1,97 % of total area covering cereals, oil crops, legumes, sugar beet, flax, and fodders. The prevailing part of production is exported. Export prices of those products are higher by 25 - 30 % in comparison to prices on domestic market. From this production there are no products available on domestic market. Their application on domestic market depends very much on chance of early habits and price of products. This form of management is

supported by state so far. It is done through the Ministry of Agriculture, which provides support of 2,000 S-k per hectare of arable land to farms managing, in the system of biological agriculture.

Analysis of food consumption in the Slovak Republic from 1990 shows, that early habits of inhabitants still do not correspond to new way of life, which considerably modified due to influence of civilization processes. Our meal is still energetically overextended and imbalanced from the point of view of nutrients. Big consumption of fats persists, although it is positive in this field, that consumption of plant fats and oils increases (by 56 % in comparison to 1990). The consumption of meat is 65.6 kg, which is still by 10 kg more than recommended annual rate.

4- PRESENT STATE OF RURAL DEVELOPMENT

Rural development plays an important role in social and economic development of Slovakia. According to official statistics, the Slovak Republic had a population of 5,325,000 as of 31.12. 1994. The total area of the country is 49,035 square kilometres. The countryside is more densely populated with an average density of one hundred and nine (109) people per square kilometre.

The age structure of the inhabitants of Slovakia is quite favourable, with approximately 25 % of the populace in the pre-productive age category (below 15 years of age), 58 % of the populace in the productive age category (15 to 56 for women, and 15 to 60 for men), and 17 % of the populace past productive age (beyond 56 and 60 respectively for women and men). Retirement ages for women and men were legally established by the national government.

Demographic gender statistics indicate, that women are dominant (51.3 %), especially in the retirement segment of the populace.

As a criterion for area classification serves density of occupancy. The limit value 150 inhabitants/square kilometre is a criterion of „rural character of the area“ (taken from OF-CD countries). According to this criterion, 78.4 % of inhabitants of Slovakia live in a country. Regions, where more than 50 % of inhabitants live in rural settlements, are rural regions. Regions, where from 15 to 50 % of inhabitants live in rural settlements are semi rural regions and those where less than 15 % of inhabitants live in rural settlements are urban regions.

Regional information indicates a spatially differentiated location of the populace: 42 % live in rural regions, 45 % in semi rural regions and 13 % in urban regions. In spite of a relatively high proportion of people living in rural regions, where Population density per square kilometre reaches 87 people, in semi rural regions is this number 105 people and in urban regions 1,022 people.

A large proportion, 31.8 % of rural inhabitants travel to work daily. Currently, the rural population is not primarily involved in agriculture with only 14 % of rural families relying on agriculture as their main source of income.

The topographical distinctions between the areas of Slovakia created inter regional differences in the utilization of the landscape. Land use for agriculture, in total area, is approximately 50. Proportionally, this land usage percentage is: 90 % in lowlands and 15 % in mountain regions. Conversely, in mountain regions 90 % is forested and 10 % is agricultural.

As far as qualification of people in agricultural enterprises, all of them are high-qualified experts. 95 % of managers of enterprises are graduated at universities; technicians are mostly school-leavers of secondary agricultural schools with general certificate of education and most of experts (tractor-drivers, repairmen, etc.) are school-leavers from 3-year expert schools.

Non-qualified workers do only basic auxiliary service. Level of education in the country in Slovakia is almost the same as that in urban regions.

Agricultural production shared gross national product by 4.84 added value by 4.22 investment by 3.31 %, and employment by 5 %.

5. SCENARIOS AND FUTURE AIMS

Since the Slovak Republic lags behind western countries in development of drinking water delivery from public water mains, and in sewage, drinking water has been given top priority in water management. Other priorities areas are :

- Measures for protection of ground and surface waters against pollution from industry, stockpiles, and aerial pollution
- Increase of level of protection of an area against floods; protection against floods from internal waters and waterlogging; protection against soil erosion; increase of accumulation of waters discharged from the area; securing enough water resources for covering expected needs; (keeping ecological limits in water taking), and preparation of possibilities of building enough water reserves to tackle improper global climate influence on water resources.
- To improve the maintenance and then according to requirements gradually modernize equipment in already constructed irrigation systems (308,000 ha),
- Adopting measures for increasing agricultural production and changing of cropping pattern, gradually increasing water use in already constructed irrigation systems,
- Depending on increase of influence of climatic changes (decrease of moisture regime in soil) gradually build new irrigation systems and resources, especially in regions with favourable soil and human factors for development of agricultural production. There have been selected areas for extension of irrigated area to 500,000 - 700,000 ha. Similarly there are searched possibilities and allocated places for construction of necessary resources of supply water - reservoirs - especially in southern part of Slovakia.
- To reconstruct and extend protection dikes for protection of the area against floods, to adopt gradual measures for increase of protection effect of a forest in catchments of important rivers, to reconstruct drainage canals and repumping stations of internal water, to complete and extend these networks and repumping stations. In the framework of irrigation and drainage programme, in order to secure maximal agricultural production, there has been calculated drainage demand on 560,000 ha of agricultural land, but at present is the drainage realized on 460,000 ha (430,000 ha from it by subsurface drainage)
- To increase implementation of effective agrotechnical measures against erosion, because at present there is 55 % of agricultural land exposed to water erosion (17 % is extremely threatened), respectively 6 % to wind erosion
- Support of increase of utilization of energy/power potential of rivers with the help of construction of new water power plants and small water power plants,
- Revitalisation of improperly executed water courses improvement their return to their original state, rehabilitation of landscape, rehabilitation of wetland
- Improvement of navigation on Danube and according to need, gradual extension of canalisation on rivers Vah, Morava, and Bodrog,
- In catchments with lack of natural water resources, and without possibility of water accumulation, to supply water from neighbouring catchments according to prepared technical solutions,
- To keep balancing of water and management of water in rivers by water management organizations which act in the framework of catchments. Gradually transfer (except strategic resources and long-distance delivery systems of drinking, water) management and supply of drinking water, sewage and water treatment for inhabitants under responsibility of municipalities

- Gradually replace recent system of financing development of water management from one centre - state budget, and persisting system of limited prices for water management service with the system of prices based on payment of cost, with taking into account not only need of performance, but also necessary development. It will help to solve present problem of lack of finance in water management,
- To secure necessary finance not only from income from water sales, its sewage and treatment, but also from activities for public benefit (flood protection), for utilization of water energy, for keeping of navigation course, etc., but also through loan policy and subsidy policy.

Rural development plays an important role in social and economic development of Slovakia. Integration effort of the Slovak Republic connected to enter into European Union requires adapting system measures and courses in the field of rural development, so as to be comparable with member states of the European Union.

The following goals are set to be realised in the field of rural development:

- to keep population in the country and improve demographic development, especially in marginal settlements
- to create new vacancies in prospective rural traditional and non-traditional sectors
- to make attractive social environment of the country, especially for weak social groups of population (children, youth, women, pensioners),
- to develop regional culture, architecture and aesthetics in the country, traditional crafts and to support rehabilitation of rural spaces,
- to be aware that all activities in the country must protect and improve environment,
- to protect soil management also in non-competitive mountain regions, where it contributes landscape development, and has also ecological and social functions, including country settlement,
- to build technical-macro infrastructure in order to reach improvement of living, conditions and conditions for job in the country

6. CHALLENGES FOR FUTURE

For realising the vision's described above, the following activities are needed.

- completing of construction of not completed constructions,
- water management,
- improvement of maintenance and decrease of water losses,
- increase of number of settlements with public water main and sewage in compliance with directives of the European Union for member countries,
- improvement of flood protection,
- increase of participation of cities and villages in management and supply of drinking water, sewage and purification of water,
- securing finance by implementation of real prices for water management activities and activities of public interest which will enable to secure not only operation, but also development.

In the field of rural development, it will be necessary to take steps for keeping population in the country in control, improvement of age composition of inhabitants, creation of new vacancies, extending agriculture also in sub-mountain regions.

Implementation of scenarios and aims will require large investments. Rate and scope of implementation will depend on growth of economic level of the country, villages and income of inhabitants, on completing of restructuralization of industry and other productive branches, on development of home trade and establishment of products on foreign markets, on investment of foreign capital into development of productive structures of the country, on entering and active participation of the Slovak Republic in international integration groups, on support and application of results of research and science, on education of experts and managers.

So, the general development of the country and its agriculture, forest and water management will depend not only on internal, but also external conditions, i.e. on development whole world economy, trade and cooperation.

In the framework of fulfillment of vision programme it is expected to continue and enhance recent cooperation with neighbouring countries, especially with those with common borders with Slovakia. The field of cooperation will include not only bilateral cooperation in the field of boundary rivers, but also multinational cooperation on rivers crossing more countries (e.g. the Danube), membership in many specialized expert organizations, in the European Economic Committee of LTNO, as well as in solving of many international programmes.

Table 1

Parameter	Unit	Year							
		1990	1991	1992	1993	1994	1995	1996	1997
Length of natural water courses	Km	8368	8368	8437	8437	24719	25307	28676	28676
From this amount : regulated water courses	Km	3073	3082	3156	3158	7131	7140	7617	7617
Important water management and water supplying rivers	Km	7307	7307	7307	7307	7383	7383	9183	9183
Length of dikes Area threatened by floods Q10	Km	2689	2690	2739	2751	2852	2852	2852	2852
	Km2	1469	1469	1469	1469	1686	1686	1899	1859
Area threatened by floods Q100	Km2	2973	2973	2973	2973	3381	3381	3984	3984
Area protected against floods Q10 and more	Km2	4893	4893	4893	4893	5201	5201	5764	5764
Length of artificial canals and inlet canals	Km	737	737	737	773	774	775	1120	1120
Dams	Number	174	175	175	185	202	202	217	217
Pumping and repumping stations	Number	61	63	64	66	562	563	585	588
Big water reservoirs	Number	46	47	48	50	51	51	51	52
From this amount : multi purposive water reservoirs	Number	41	42	43	45	45	45	45	45
Drinking water reservoirs	Number	5	5	5	5	6	6	6	7
Total controlled volume	Mil.m3	1628	1631	1827	1830	1855	1855	1855	1865
From this amount : multipurposive water reservoirs	Mil.m3	1506	1509	1705	1708	1708	1708	1708	1708
Drinking water reservoirs	Mil.m3	122	122	122	122	147	147	147	157

* including Water Reservoir Zilina on river Vah, which is close before completing.