National Environmental Health Action Plan (Kazakhstan)

In recent years, vital statistics has continued to deteriorate rapidly. For example, as compared to 1992, in 1997 birth rates decreased from 19.9 down to 14.7 (per 1000 population) or by 25.2%; mortality rate increased from 8.1 to 10.2 or by 20.6%; natural population growth rate dropped from 11.8 down to 4.6 or by 2.6 times; and infant mortality rate, on the contrary, decreased from 26.2 down to 24.2 or by 7.7%. The incidence rates of selected communicable and non-communicable diseases have also increased.

It was found that the deterioration of health indicators had been mainly caused by an integrated impact of both natural and occupational environment, social problems and the economic situation in the country. The above-mentioned factors are directly related to nearly 75% of all diagnosed cases, more than 50% of deaths, about 60% of abnormal physical development and the reduction in life expectancy by 5-7 years (N.D.Sokolov (1989), G.A.Kulkybayev (1997)). About 1/3 of hospital beds occupied were reserved for and almost half of the attending physicians had to deal with the management of diseases associated with unfavourable consequences of these factors.

Nevertheless, as has already been demonstrated by health care practice of the former USSR and other countries, the extensive approaches to medicine had been exhausted, and at present it is the prevention rather than the treatment of diseases is in the forefront. The message of the President of Kazakhstan N.A.Nazarbayev “Kazakhstan 2030…” is dealing with all these issues.

General incidence rate remains to be increased, i.e. 77 617.3 per 100 000 population, and 78 225.5 – among children.

Higher morbidity indicators are connected with such conditions, as respiratory diseases (30 843.4 in 1992 versus 21 702.6 in 1996); nervous system and sensory organ disturbances – 10 074.2 and 9380.4, respectively; gastrointestinal diseases – 9361.8 and 73 014; circulatory diseases – 6126.3 and 5620.7 per 100 000 population.

The incidence of malignancies continues to be high, i.e. 1553.2 in 1992 versus 1422.1 in 1996.

Throughout the period chosen for comparison, the incidence of communicable and parasitic diseases had slightly decreased and made up 4877.1 and 4159.2, respectively.

Among the infectious diseases, tuberculosis stands out as a problem of special concern since the number of deaths associated with it is rising annually, being 11.7 in 1992 and 34.6 in 1996 per 100 000 population.

So, one may presume that to a great extent health status of the population is affected by unfavourable environmental situation, technogenic pollution hotspots in the Republic and complicated social problems of the transition period which requires efficient preventive measures to be urgently taken in the environmental health area.

The environmental situation was aggravated by the unwise decisions taken in the past in connection with large environmental projects. As a consequence of these decisions, one can observe such environmental problems, as drying of the Aral sea, shallowing of the Balkhash lake, depletion of the glacier resources, etc.

Negative consequences of the military-industrial complex activities are serious as well. A vast central part of Kazakhstan is polluted by rocket fragments and toxic propellant.

The aftereffects of the nuclear arms tests conducted over the Semipalatinsky Nuclear Testing Range are estimated as grave. From 1949 to 1989, there had been radioactive fall-out over the bordering territories occupying more than 300 000 km²,
including Pavlodarskaya, Karagandinskaya and Eastern-Kazakhstanskaya Oblasts with over 1.7 million population, and in 711 human settlements the radiation dose increased an average annual norm. These territories were declared by the Government of the Republic of Kazakhstan as “The Semipalatinskaya Environmental Disaster Zone”.

A sharp rise in the number of transportation vehicles contributes to intensive urban air pollution.

Combustion products of liquid/solid fuel and natural gas, particularly the emissions of large thermal power stations (TETS), state territorial electric power stations (GRES) and boiler rooms, had lead to air pollution. Around huge industrial complexes, technogenic biogeochemical provinces (with exposure to zinc, lead, etc.) are being formed.

Community water supply problems, especially in the Northern part of the Republic, happen to be one of the major difficulties. Drinking water shortage and worn-out water pipe-lines are the reasons of deteriorated potable water quality and higher incidence of intestinal infections.

Structural changes in agriculture and weakening of the veterinary control of cattle, in addition to natural foci of zoogenetic infections, contribute to higher incidence of brucellosis and tuberculosis both in animals and humans.

**Current situation**

Quite often epidemic complications, and high incidence of acute intestinal infections and cases of viral hepatitis are attributed to massive water source pollution, poor sanitary and technical maintenance of the water-supply facilities and networks, and high microbiological pollution of drinking water.

Although a comparative analysis of the infectious disease morbidity in 1991 and 1997 has a certain downward trend, in a number of the Oblasts one can observe ongoing epidemic problems while the incidence of acute intestinal infections (AII) and cases of viral hepatitis is much higher than average rates throughout the Republic. Such Oblasts, as South-Kazakhstanskaya, Mangistauskaya and Kyzylordinskaya are among these territories. The incidence rate of this group of infections in these Oblasts varies between 385.1 (Zhambylskaya Oblast) and 803.8 (Kyzylordinskaya Oblast) while the Republican average rate makes up 339.0 per 100 000 population.

An unfavourable situation is still observe with the incidence of viral hepatitis (VH). In recent 10 years, over 800 000 people had different types of hepatitis. The incidence rate of these infections per 100 000 ranges from 222.8 to 856.7. In 1997, the morbidity rate of VH throughout the Republic made up 407.4, and in 6 Oblasts it was even higher and varied between 415.9 (Almaty-city) and 856.7(Kyzylordinskaya Oblast). The overwhelming majority of those who contacted the disease were children (in 1995 – 41 125 or 70.7%; in 1996 – 33 006 or 66.3%; and in 1997 – 47 012 or 73.2%). In some Oblasts a percentage of the affected children is even greater, i.e. 90.9% in Kyzylordinskaya, 81.6% in Atyrauskaya, over 80% in Zhambylkskaya, 85.3% in Mangistauskaya and 82.8% in South-Kazakhstanskaya Oblasts.

In 1997, viral hepatitis A made up 89.3% of all types of VH. The incidence of viral hepatitis B is also high.

As indicated above, poor water supply significantly contributes to high level of AII and VH.

In this country as a whole with its 2479 water-supply systems available, about 80% of the population have access to tap water and nearly 12% - to decentralized water
sources, while the remaining percent of the nation (above 500 000 people) rely on open water bodies and water tanks delivered to them.

Even more serious situation is now observed with the rural water-supply bodies which as a result of complete privatization of agricultural objects, had happened to be an ownerless property since the latter requires substantial financial investment for its sanitary and technical maintenance and in the immediate future is not promising at all in money teams. Moreover, community-based rural water-supply systems gradually become inoperative also, and this network includes thousands of kilometers of water mains connected to nearly 1200 villages for which this is the only source of potable water. As a consequence, these villages may be and some of them have already been faced with a desperate situation being deprived of the centralized water supply.

At present one should most carefully interpret the statistics related to both access to tap water available for the local community and average daily water consumption per one inhabitant since the validity of these data cause strong doubts due to unstable operation of the water-supply projects.

Every year, the incidents of intensive and highly intensive pollution of surface waters are recorded. For instance, in 1997 along the Ilek river, in the vicinity of the towns of Aktyubinsk and Alghi, there were 43 pollution incidents with the MACs being higher by the factor of 98 and 70 for boron and phenol, respectively; along the Krasnoyarka river and the Irtyskh river, there was one incident of pollution with zinc whose MAC had been higher by the factor 990; along the Ili river basin (Bol and Malaya Almatinka rivers, Kaskelen river), there were 21 incidents of pollution with nitrates up to 94 of their MACs. In the vicinity of the town of Zhezgazgan (Sarysu river) there was at least one episode of water pollution with oil products up to 67.6 of their MACs.

As of now, the majority of sewerage collectors and networks as well as sewage water treatment facilities have a considerable wear in addition to continued shortage of chlorine-containing reagents; and the concentrations of pollutants and microorganisms in water delivered to its treatment plants and in wastewater outfalls happens to be much higher than the allowable level. The efficiency of the treatment facilities usually does not exceed 40-50%.

**Priority areas** include:

- Development of the law of the Republic of Kazakhstan “On Drinking Water”;
- Provision of potable water in the rated amount and of standard quality for the population of the Republic of Kazakhstan, and ensuring epidemic safety of surface water bodies at the water use sites;
- Prevention of communicable and non-communicable diseases associated with such factor, as water;
- Development and implementation of measures aimed at stopping or reducing the level of chemical, physical or biological pollution of surface sewerage systems and water reservoirs used for economic and drinking purposes and recreational needs of the population, as well as at bringing the water quality parameters up to its natural background;
- Proper sanitary and technical maintenance of economic and drinking water use objects, including water intake and water-line facilities, water pipe-lines and water distribution network, hydrants, etc., artesian wells, water intake wells, water springs, fill-and-draw tanks;
- Retrospective analysis conducted in selected territories to find out cause and effect relation: “pollution of water objects versus morbidity of the population”.
Action plan includes:

- Development of legislation and normative acts regulating the rights, duties and responsibilities of physical persons and legal entities – owners of the water-supply objects and water consumers;
- Development of requirements placed to chemical and microbiological composition of potable water, sanitary and technical maintenance of water-supply facilities and networks, other water-supply objects providing for community water delivery to meet economic and drinking needs in the rated amount and of an adequate quality;
- Study of correlation between the levels of chemical, physical and biological pollution of the water sources, on the one hand, and the infectious and somatic morbidity of people, on the other, including the development of corresponding recommendations;
- Development and implementation of a complex of measures to bring chemical and microbiological quality parameters of water yielded through surface and ground sources to its natural background;
- Ensuring the design, construction, repair and expansion of water pipe-lines in urban and rural areas with no centralized water-supply systems;
- Construction of water reservoirs for regulating surface runoff and building up atmospheric precipitation water reserve in arid zones;
- Development of scientifically and hygienically sound basis and methods of rational water use and disposal, water resource and human health promotion activities;
- Reduction of the volume of water disposed of as polluted industrial sewage water, development and implementation of measures to improve the performance of water treatment facilities, striking the right balance between water use per unit of production and the normative consumption, revision of technologies by making them less water-dependent or waste-free, increased use of recirculating water supply;
- Holding of annual contests in sanitary condition of the water objects for their compliance with sanitary rules and norms “Surface Water Quality Protection”, availability of water protection zones, detection of those sources which pollute the riverside and the neighboring territories, meeting the accepted standards for ploughing agricultural virgin lands, applying pesticides and mineral fertilizers when air method of plant protection is used;
- Laboratory tracking (monitoring) of chemical and microbiological pollution of water sources at its use sites, development of hygienic forecast of the conditions of water objects, development of the ecological passport, including subsequent inventory of the water bodies;
- Introduction of alternative techniques of drinking water purification and disinfection;
- Hygienic classification of the water objects depending on their chemical and microbiological pollution of water at its use sites;
- Decision-making on the possibility of using selected irrigation and watering systems as the sources of centralized economic and drinking water-supply;
- Organization of hygienic education for raising sanitary awareness of the personnel working at the objects of economic and drinking water-supply;
- Wide-scale health education and advocacy activities among all strata of the population on the prevention of water-borne outbreaks of acute intestinal infections and viral hepatitis, and parasitic diseases;
- Use of deposits of ground mineral water sources for erecting balneotherapeutic sanatoria and bottling plants for the production of table and mineral water;
- Decision-making concerning the construction of bottling plants for the production of drinking water to be supplied for arid or water lacking areas;
- Development of the projects and construction of popular recreation zones along the banks of the open water bodies;
- Designing, construction and expansion of the facilities providing for total biological treatment of urban sewage water, construction of sewage farms, filtration fields and other objects meant for the tertiary treatment of sewage water;
- Medical and geographical mapping depending on the available water resources and anthropogenic load;
- Assessment of the surface and ground water resources, including their quality forecasting;
- Control and implementation of the activities aimed at drinking water fluoridation and decreasing water mineralization;
- Improvement of water preparation, treatment and disinfection systems, and introduction into practice of new, more cost-effective and efficient systems;
- Development and improvement of drinking water quality standards with due regard for the regional anthropogenic load (chemical, physical and microbiological);
- Toxicological and hygienic quality control of the materials, reagents and equipment used in the economic drinking water-supply practice;
- Improvement of the methodology of hygienic studies in the area of developing medical and microbiological quality criteria for the water sources.