

## ENVIRONMENTAL PROTECTION IN KYRGYZSTAN

Falling industrial and agricultural production has led to reductions in raw sewage emissions and emissions of atmospheric pollutants from stationary sources. However economic decline has also cut funding for environmental protection and caused the quality of waste treatment installations to drop. The greatest pollutant of the air in urban areas is automobiles, the number of which reached 72,000 in Bishkek in 1994. During the 14 hour peak period of the day, major thoroughfares in the capital experience point traffic flows of over 300 vehicles every 10 minutes, or 20,000-30,000 vehicles per day. Thus on a 100 meter stretch of street 2 tons of fuel are burned every day, giving off about 1,500 kilograms of air pollutants. Total pollution emissions by state vehicles (about 38,000, of which 2,300 are buses) is 74,000 tons per year; private transport emits 4,500 tons of pollutants in a year. Winter and nighttime temperature inversions cause gas and dust clouds to accumulate over urban areas, which at times have than been observed to produce photochemical smog.

Bishkek is home to over 270 industrial and transport enterprises, 50 of which are the most serious polluters. Among these the biggest by far is the central heating and electric plant, which in 1994 gave off 22,500 tons of pollutants or 35 % of total emissions for the whole republic.

In winter, the majority of Bishkek's 4000 private homes are heated by coal which contributes up to 2,000 tons of air pollution per year. Especially bad air pollution exists in the neighborhoods of the city's eastern and western industrial zones, where maximum permissible concentrations of harmful airborne substances are exceeded five-to ten folds. Bishkek and Karabalta, two of the largest cities in the country are at the top of the list of cities with polluted air.

Kyrgyzstan's natural and climatic features have been a determining factor in the distribution of human settlements in areas with uncomfortable temperature and humidity regimes. Wide fluctuations in temperature are characteristic of every season of the year. In a 24 hour period the temperature may vary by as much as 20<sup>0</sup> to 30<sup>0</sup>C, and yearly fluctuation can be more than 60<sup>0</sup>C Especially in summer, to high concentrations of dust in the air.

Under these general conditions creating proper microclimates for human settlements depends crucially on construction methods and, most of all, on plantings of greenery. In terms of static's on urban planting, Kyrgyzstan's cities and towns lag behind many cities with more favorable climatic conditions. There are approximately 70 square meters of greenery for every urban dweller, or about half the level found in the Baltic states and the Ukraine, which moreover do not have Kyrgyzstan's problems of dry air, heat and dust. In addition, the last few years have seen shrinking areas and worsening condition of these plantings. Green areas occupy only 39% of the total land area in Bishkek, which shows that proper attention and funds have been given to creating an ecologically healthy environment in our cities. By comparison Vilnius is 54% green: Kiev 70%.

According to doctors, children's disease rates – and especially rates of respiratory diseases caused by air pollution – are 20% higher in the center of the city than on the periphery.

On busy thoroughfares noise pollution, which may reach the 80 decibel level, is a serious problem. Many settlements have high-voltage lines running through them at insufficient distances from residential structures. Furthermore, the burning of coals which contain radioactive substances causes high radiation levels in some settlements.

The sanitary situation in Kyrgyzstan's settlements is not good. Centralized plumbing sewers and other municipal services are poorly developed. In many villages the people use untreated surface water for drinking. Up to half the populations of the cities of Osh and Kara-Kul

rely river water. In Bishkek, where new private housing zones have expanded, the number of people with no access to piped water has reached 20,000.

In recent years Bishkek and its environs have seen the arrival of the brown rat, and presently no steps are being taken to combat this new pest. The mountains of trash and kitchen garbage which have lain and accumulated on our streets over long periods of time are very favorable environments for insects and rodents, which may carry disease and cause epidemics. Rats may also cause significant economic loss. Fewer than 10% of the capital's waste dumps conform to sanitary standards and neither municipal services nor enterprises within the city have the funds to pay waste treatment facilities or for sewer maintenance, so that these are now falling into decay.

One of Kyrgyzstan's peculiar characteristics is the unequal territorial distribution of its population. People are settled on no more than 10% of the land in the republic, principally on flatlands at the foot of mountain ranges and in valleys between them. Here the main sources of environmental pollution are concentrated. Outside built-up and cultivated zones the condition of the air, surface waters and soils as a rule is up to standard. Pollution is localized, and some types are seasonal.

The level of water consumption is staying relatively stable. In 1994 the total intake from water sources was 10.9 billion cubic meters, compared to 11.1 billion in 1991. The majority of sources have water of excellent quality; nevertheless water is continually being polluted by wastes from industry, agriculture, human habitation and transportation. About 90% of the republic's drinking water is drawn from underground sources, which are also vulnerable to pollution. A number of wells in Chui and Issykkul oblasts have been shut down because concentrations of toxins exceeded permissible levels. Concentrations of harmful substances also are rising in a number of catchments in the Chui river basin and in Osh and Jalal-Abad oblasts.

A group of scientists from the National Academy of Sciences has discovered serious changes in the hydrogeology of underground waters in the Ala-Archa basin (more properly the Ala-Archa-Alamedin basin), which are used to supply Bishkek. The reason that these waters have become contaminated is that the aquifers which supply the city's water pipelines have been penetrated by surface water polluted with industrial and human waste which seeps down from within the city and its immediate vicinity. Previously clean water now frequently circulates with admixtures of dirty water leached from the surface and from adjacent deposits. The underlying cause of the problem is that water is being drawn off the aquifer faster than it can be renewed. Undersized herds are concentrated around population points. Seasonal herding in distant pastures is being given up in favor of stationary grazing near home, with the result that the burden on remote grazing lands is lightening while the land around rural settlements is being seriously overgrazed. In these areas plant life is being degraded and the soil is being filled with dung-borne microbes and worm eggs.

The ecological well-being of any locality is based on the ability of its biosphere to renew and reproduce the conditions necessary for life. This ability in turn, depends on preserving the relationship between producers and consumers of biomass. Forests are most important in this respect: they occupy only 4.2% of Kyrgyzstan's land area but produce 20% of its biomass. Yet our forests are in danger. In 1994 alone, 34,900 cubic meters of timber were cut under the pretense of "thinning and clearing" and the population cuts down at least that much for fuel and building material. The privatization of natural and planted forests which is now under way could have a negative effect on the condition of these lands.

Cattle grazing in woodlands presents an especially great danger in the south of the republic, where unique wild walnut, juniper, almond and pistachio forests are being degraded as a result. In some places in these forests herds have trampled away the soil down to the roots of the trees. Erosion affects 10,000-14,000 hectares per year. The Arslanbob walnut forests are home to about 3,000 families. These people have no work, but only live on the forest cutting trees for

fuel, grazing their cattle, gathering nuts. The forest is degenerating around them. No trees younger than 20-30 years are left, so that natural renewal has been halted.

In spite of the fact that cattle and fowl populations have dropped sharply, domestic animal biomass is still one or two orders of magnitude greater than that of wildlife. In 1994 domestic biomass was estimated to have reached 200,000 tons, which with its unequal distribution places extremely heavy burdens on certain ecosystems.

Cities, towns and other settlements where mining and metal-processing industries are located have their own specific contamination problems. Some of these population points are located in the immediate vicinity of dumps and tailings and 66 dumps in the republic containing radioactive elements copper, zinc, silver, cadmium, antimony, mercury, iron, fluorine, arsenic, thallium, barites, cyanides.

The state coal concern Kyrghyzkomur, which extracts coal in open pit mines, has contributed greatly to the level of dust in the air and to the creation of extensive lunar-type landscapes. More than 1,000 hectares are taken up by open pits, access roads and dumps (containing 412.1 million tons of rock). In a number of cases the dumps are placed on fertile ground or in productive natural ecosystems, which are then destroyed not only under the waste material itself but also for a great distance around it. The dry, high-altitude climate in these areas significantly reduces the prospects of returning these lands to cultivation or their natural state; the damage will remain literally for centuries. These problems must be kept in mind as plans are being made to develop the mining industry in the republic. Often the economic gain is not enough to compensate for the attendant destruction of the natural environment.

Losing our ecosystems, we may then lose our lives. What good will an economy be then? We must create an ecological economy.

Financing of the social sphere and particularly housing construction was carried out in Soviet times by allotting funds left over when more "important" needs had been met. The result is an unattractive human habitat. As acute housing shortages existed at all times during the Soviet period, they have naturally passed on into post-Soviet times. The new independent states are in no position to solve all their inherited problems immediately.

The necessity of protecting the environment was only first acknowledged in the 1980s, but even since then not a single environmental protection program has been implemented in full. The funds allotted for these projects were tiny, while for 74 years of Soviet power the natural environment had suffered fundamental damage. Bringing the environment back to good health will be a constant high-priority task.

One third of all ecological danger spots in the republic have no sanitary protective zones surrounding them, but on the contrary are home to about 150,000 people. Air pollution in urban areas is having progressively worse effects on the health of the population. According to the Institute of Prophylactics and Medical Ecology, the health index of young children living in areas of greatest air pollution is 4-6 times lower than in areas with relatively clean air.

Waste water emission is a serious problem. Every year in the republic over 1 billion cubic metres of waste water are discharged into aquifers and surface waters, including 1/63 million cubic metres of sufficiently treated water which is sent directly into lakes and streams. This is one reason why Kyrgyzstan has high rates of infectious and parasitic diseases.

Regions with developed agriculture have their own complicated ecological problems. Agriculture's strict specialization in cash crops (cotton, tobacco, sugar beets) without necessary technical consideration has required the use of large amounts of pesticides. Furthermore these substances are neither periodically updated nor employed rationally. As a result the environment, especially soils and water, has become contaminated with highly toxic organic phosphates. Many women recently tested in the Fergana valley had breast milk contaminated with at least two organic compounds.

An assessment study has been conducted on the health of children in tobacco- and cotton –

growing areas which clearly reveals the higher risk to children's health posed by agriculture chemicals. The study also establishes a direct correlation between the use of pesticides and the incidence of respiratory diseases and malignant tumors among children up to age 14.

The sanitation supervisor is concerned by the continued worsening of the of the sanitary and physical condition of watermains and by the resulting drop in the quality of the population's water supply.

In 1994, 145 of the country's 1,022 water mains were in unsatisfactory condition. Nine of these were owned by cooperatives and 136 by departments of the state. Ninety-two mains lacked necessary sanitary protection zones around their sources and catchment structures, and 63 had no installations for disinfection. The majority of water mains in use were built more than 40 years ago and have never had capital repairs, and 40% of our local supply networks are worn out and in need of replacement or reconstruction. Only 46% of the total length of Kyrgyzstan's rural water mains are serviced by the Kyrgyzselremkhoz maintenance agency. Staff laboratories which monitor the quality of water in rural mains have been cut to the minimum. As state and collective farms have who lack qualifications on farms which lack the necessary repair equipment and facilities.

The problem of providing the city Kara-Kol with good quality drinking water has gone unsolved for a long time. Sixty percent of the people there drink untreated and undisinfecting water straight from Kara-Kol and Kashka-Suu rivers. As a result, the population has suffered 61,9% rise in case of viral hepatitis and a 57,7% rise in digestive illnesses of undetermined origin. Consumption of contaminated waters is also blamed for 35 cases of dysentery in Ak-Suu. Because of extremely limited financial resources and lack of building materials, construction of water pipelines in the republic has basically halted. Only individual lines are being laid.