DESERTIFICATION IN THE NEAR ARAL SEA REGION AND POPULATION MIGRATION

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The drying of the Aral Sea bottom has sharply changed the environment to worse with negative outcomes for the socio-economic development of the region and desertification of large area. The change in water supply conditions of the territory around of Aral Sea Region and the drying of the Aral Sea related to it has caused the problem of desertification. Desertification means degradation process taking place in environment accompanied by a drop in the biologic productivity, development of erosion, salinization and other negative outcomes which directly influence the living conditions of the population and functioning of the region’s economy. And the active influence of human activity on environment not only aggravates this process, but is often one of the major causes of its occurrence. The problem of social development of the region must be first of all highlighted in the aggregate of problems. The problem of supply of rural population with quality drinking water remains one of the acutest social problems. This situation is aggravated by intensifying environmental crisis of the Aral Sea and the area, pollution, depletion and degradation of water supply sources. A drop in the living standards of population is a regular process of the transition period, but it became aggravated as a result of the impact of the deteriorating environment in the Aral Sea crisis epicenter.
Changes of environmental and climatic conditions

The territory of Central Asia represents quite a homogeneous territory in orographic and climatic terms. The climatic features develop under the influence of three major factors: solar radiation, circulation of atmosphere and underlying surface. The considerable amount of solar energy received in summer by the Central Asia territory, due to its location in subtropical latitudes, cause intensive heating of soil and air.

Vast waterless Karakum and Kizilkum deserts surrounding the Aral Sea are huge sources of transformation of air masses, which freely enter the plain part of the territory from west, north-west and sometimes from north-east.

The current tendencies in steady development require complex and continuous attention to all environmental sites. The problem of conservation of biodiversity on the planet and monitoring become especially important when it comes to ecosystems formed and developing under extreme conditions.
The Amudarya River is the largest of Central Asia, along with the Syrdarya River it provided with water the continental lake - the Aral Sea. Rapid development of irrigated lands started in the 1960s gradually led to the necessity of regulation of its channel with dams and withdrawal of a considerable part of its water resources for agricultural needs. As a result, of the total water amount constituting about 90% is used in agriculture, 4% in public utilities, about 2% in industry, 1.8% in rural water supply, 0.8% in fishery and less than 1% by other consumers.
Only in the last twelve years, the area, occupied by vegetation associations which are capable to exist in flood plain habitat provided that they are flooded every year, has decreased from 40% to 30%. At the same time the number of associations confined to saline and desertified areas of the flood plain and delta has increased from 25% to 70%.

The areas of liquorice associations, which were once widely present in the Amudarya delta, have decreased from 12 000 to 1 500 ha. The areas of hay fields and pastures and their yield were also subject to a considerable decrease. For instance, of 420 000 ha of hay fields existed in 1960, by late 1990s only 70-75 000 ha remained.

Their yield on fields which are subject to unperiodic flooding decreased from 1500-4000 kg per ha to 300-1600 kg per ha, and on unflooded desertifying areas to 70-80 kg per ha (dry period), i.e. 22 times less. The area of pasturelands in the flood plain and delta has decreased from 348 000 ha to 125 000 ha. For the last 30 years, the area of meadows in Aral Sea has decreased from 600 000 to 70 000 ha.
Kizilkum desert occupies a vast expanse of the Syrdarya and Amudarya inter-fluve, the second desert in area in Central Asia after Karakum. The Karakalpak Kizilkum is one of major pasturelands of distant-pasture animal husbandry. Monotonous sandy territories sometime extend to many kilometers, sometime ridge-like sand dunes uniformly alternating with takirs suddenly rise amidst flat expanse.

*Desertified tugay forest*

*Plants expansion on the dried bed of the Aral Sea*
The drying of the Aral Sea bottom has sharply changed the environment to worse with negative outcomes for the socio-economic development of the region.

Before the Aral Sea had not only played the role of the factor influencing the coastal areas but the function that regulated as well the temperature and humidity in area of Aral Sea. In the last years, the number of dust-storm days has increased by more than 50% in the drying part of the Aral Sea.

And lengths of dust-storms and their steadiness have increased. The contribution of the Aral Sea to the regional humidity transfer has decreased from 5-8% to 2.6-4%.

The frostless period has decreased by 10-12 days. The total inundated area, which made in 1950 350 000 ha and of inundated lakes and water bodies 80 000-100 000 ha, has decreased almost two times.
Water supply and desertification

The change in water supply conditions of the territory and the drying of the Aral Sea related to it has caused the problem of desertification. Desertification means degradation process taking place in environment accompanied by a drop in the biologic productivity, development of erosion, salinization and other negative outcomes which directly influence the living conditions of the population and functioning of the region’s economy.

And the active influence of human activity on environment not only aggravates this process, but is often one of the major causes of its occurrence.

The environment developed in the region requires considerable changes in the socio-economic development policies and strategies. Consideration of the following major trends is the specific aspect of development of areas that are under extreme natural and environmental conditions.
Population: socio-economical situation and changes by desertification

Among the resource potentials of the republic the population and labour force are of especial significance. The demographic development of Aral Sea region has always been complex. The birth rate remaining high for a long time was not supported by adequate economic growth that negatively affected the living standard and health of the families having many children. The Aral Sea Region inherited an unfavourable demographic situation from the past: high infantile and maternal mortality rate, a large number of families with uncontrolled high birth rates, low social and territorial mobility of population, extremely uneven settlement of population concentrated in oases and long-irrigated areas. As of the beginning of 2002, in Aral Sea region there were 1 533 900 people, including in towns: 713 900, in rural areas: 764 900. Since early 1990s the growth rate of population started decreasing. While during 1991 to 1995, the yearly average growth rate of population amounted to 2.4%, including in towns: 2.5%, in rural areas: 2.2%, in the last four years it decreased and amounted to 1.5%, 1.5%, 1.6% respectively.
During these periods this drop in growth rate took place more slowly in Uzbekistan as a whole. While during 1991 to 1995, the population of Aral Sea region increased by 152,000 people, in the following 4 years by 86,300 people.

During the years after independence, the slow demographic growth has been especially clearly noticeable. It is accounted for the influence of two most important factors: a drop in birth rate and a rise in emigration (in comparison to the 1980s). It has to be noted that the drop in birth rate occurs not only in towns, but in rural areas as well, and in rural areas more intensively (from 1990 to 1997, the aggregate coefficient decreased in towns 1.5 times, and in rural areas 1.8 times, while it decreased in Uzbekistan as a whole 1.3 and 1.5 times respectively).

The mortality rate is relatively low, mainly due to age group features (high percentage of youth and relatively low percentage of retired people). A sharp drop in infantile mortality rate is the chief achievement of the Karakalpak republic. In the 1990s, it dropped 1.8 times.
Emigration is one of the factors influencing the behavior of the number and make-up of the population. At present it facilitates deceleration of growth rate. The migration balance for the last 12 years made -45,500 people. Rural and town people migration is decreasing. In the past years, migration for education purpose predominated, therefore, about half of the migrating people consisted of youth below 30 years old, and as a whole, the percentage of able-bodied people reached 85%.

Map of population density of Karakalpakstan, persons per square kilometer, generalized on small rural communities.
By estimates, in 2000, the yearly average number of able-bodied labour force of Aral Sea region area amounted to 772 600 people against 690 900 in 1997, 657 900 in 1995 and 576 900 in 1990.

In 1991 to 2001, the growth amounted to 195 700 people, i.e. 25.3%. About 50% of labour force is located in rural areas, against 55.8% in all Uzbekistan.

The yearly average growth rate of able-bodied labour force in 1991 to 2001 is ahead of the country’s indicator and amounts to 2.6%, against 2.2%, which creates additional difficulties in providing the population with employment.

According the labour force balance data, of the total number of labour force of Aral Sea region 69.0% are employed in economy, against 74.4% in Uzbekistan, 10.4% and 8.0% respectively receive off-duty training, unemployed population amount to 19.5% and 17.2%.
The percentage of people provided with employment through employment agencies is decreasing. Unemployment rate is growing particularly in small towns, settlements, and rural areas. Still little attention is being paid to off-duty training of people who applied to employment agencies. The number of people receiving unemployment benefits is increasing.

Percentage of unemployed and economical refugees in rural families, living in different zones of Karakalpakstan
Social-economic condition and changes of the Karakalpakstan as Desertification area

The problem of supply of rural population with quality drinking water remains one of the acutest social problems. This situation is aggravated by intensifying environmental crisis of the Aral Sea and the area, pollution, depletion and degradation of water supply sources.

The gas supply level of houses in Uzbekistan is 85%. This indicator looks better in the Republic of Karakalpakstan than in other regions of the country, i.e. 99%. In 1991 to 2001, over 55 000 km of gas pipe-lines had been installed which was financed by all sources of financing. And supply of rural areas with piped gas is carried out at a much higher tempo: during this period over 40 000 km of pipe-lines had been put into operation.

While in 1996 15 private institutions, 1 small business, 8 cooperatives, 10 businesses of other forms of ownership functioned in the Republic of Karakalpakstan, in 1999 these figures made respectively 49, 2, 12è41. And in 2001, 84 non-government sector health institutions functioned making 10.4% of the total number of health institutions.

In spite of the increase in the number of health institutions, during this period the number of hospitals had decreased (from 102 to 90) and the number of hospital beds (respectively 9 100 to 7 200).
At present, there function 764 general education day schools in the republic, in which 377 800 children receive education. Out of these schools 537 function in two shifts, i.e. 70.3% of the total number of general education day schools. 129 200 pupils receive education in the second shift, i.e. 34.2% of the total number of pupils. Beside this, 2 700 pupils receive education in the third shift. In settlements, 23.3% of day schools function in two and three shifts.

3 high schools provide education to students in Karakalpakstan, in which 9 200 students receive education in day courses. In 20013 354 students were taken in by the high schools, of which 2 799 students were taken in by the day courses. As of the beginning of the 2001/2002 academic year, 3 academic lyceums and 64 professional-orientation colleges with the total number of students 886 and 20 458 students respectively function in Karakalpakstan.

Along with this, no considerable changes took place in the level of supply of the general education schools with materials and equipment. There is still shortage of teaching staff in educational institutions, first of all in general education schools, teaching staff, teaching aids and methodic books on newly introduced subjects.
Conclusion

By the living standards and income level the Karakalpakstan holds one of the lowest places in Uzbekistan. The growth in the cost of living and in prices is ahead of the population’s income growth. The inflationary processes are leading to a drop in population’s living standard; the continuing growth in incomes is leading to the social differentiation processes, development of new income-to-expenditure proportions. The growth in real incomes is mainly achieved by raising the salaries. In the production sectors, a gap is observed between the average salary in Karakalpakstan and in Uzbekistan as a whole in agriculture (by 55.6%); there is a considerable growth in salaries 1.4-1.5 times in industry, construction, communication and transport.

A drop in the living standards of population is a regular process of the transition period, but it became aggravated as a result of the impact of the deteriorating environment in the Aral Sea crisis epicenter. In the transition period, the government regulates the social processes, raises the minimum salary level, pensions, allowances and in spite of these the living wage drops. Therefore, improvement of social protection of population considering the environmental situation, which has developed in the Aral Sea area, is one of the priority aspects of further reformations in the Republic of Karakalpakstan.
Thank you for your attention