Monitoring of Influence of the Mining Industry on a Soil-Plant Cover in Ganja-Kazakh Region of Azerbaijan

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Abstract:

Since second half XIX of century on an extent almost 150th years in the west of Azerbaijan in Ganja-Kazakh economic region in Dashkesan and Kedabek districts are spent working out colour (gold and copper) and ferrous metals (iron ore). The mining industry has affected transformation of natural landscapes; a waste on ore enrichment is a source of pollution of a soil-plant cover and water sources. In article necessity of creation and carrying out of monitoring quantitative and quality standard of influence of the mining industry on components of environment and forests is proved.

Key words: monitoring, mining industry, soil, plant, landscapes, pollution.

Introduction:

Azerbaijan black and has for development of the non-ferrous metal industry to stock of enough mineral raw materials. But basic source of raw materials of the black metallurgy consists of Dashkasan fields of iron ore, basic source of raw materials of the non-ferrous metal industry Zeylik-Alunit from ore beds. Gold and copper non-ferrous metal industry are consist in Kedabek ore beds. Reserves of raw material were in these fields will be able to suffice leap years for development mountain in the country of industry.

Materials and Methods:

The Ural of the industry of important mine, ore Azerbaijan name the Dashkasan district of whose center is been of the republic justly. There are beds of rich iron ore, alunite and marble here (Djafarov M. I., Babaev A.G., Ibragimov Z.A., 2005). Dashkasan iron and cobalt belts which were in the height 1600-1800 m from the sea level were known still 1867. There are Dashkasan strong blue coloured special mineral beds about the group of barite, amphibole here. The Dashkasan district is quite rich by natural wealths. The iron ore etc of whose strategically importance is been in the time of the Soviet Union in the Dashkasan. It have been taken out. There are very valuable natural stocks like iron ore and marble in mountains in territory of the district now, too. But have been begun with industry way of the ore here to production from 1954 and continue present time. Negative influence of mining industry is very different and great to environment mountain (fig.1 and fig.2). The basis of the mining industry in Kedabek area has been put in pawn by German mesenate of brothers Siemens on copper melt in 1848-1914 (Siemens Brothers). Operation of copper deposits was spent by a mine method by the subsequent melt of copper ore. As the energy carrier for ore melt wood coal that has been interfaced to an intensification wood was used. Forests of 8711 hectares have been transferred by the area in long-term using Kedabek and Kalaken copper ore melt to factories of brothers Siemens. Before transfer of the specified site copper melt to factory and carrying out forest inventory (1892) how many and as woods were cut down, are not present official data. There are isolated data on wood cuttings since 1880, which (these data) allow to judge about volumes are annual timber cuttings. For five years, 1887 - 1891, on fixed for copper melt factories the natural boundary officially has been cut down 12478 cubic sajen (1 cubic sajen = 9,71 m³) wood on the area approximately 2000 desyatin (1 desyatin = 1,09 hectares) (Ibragimov Z.A., Djavadzade D.B., 2013. Along with operation for needs of the mining industry, the attention to the account and an estimation of wood resources (forest inventory), and also wood renewal was paid. The first forest inventory works in Azerbaijan, and as a whole on Southern Caucasus, have been spent Kedabek area on attributed coper
melt factories woods on the area of 9 thousand in hectares in 1892. In the end of XIX, the XX-th century beginning in territory of Kedabek area brothers Siemens had been spent works on artificial renewal of beechen (Fagus orientalis) woods by creation of silica cultures, silica cultures with use of pine (Pinus silvestris, P. nigra), firs Caucasian (Abies nordmanniana) are created. The silica cultures of coniferous breeds created at that time are elderly over 100 years differ high efficiency and is the fullest meet the requirements to soil-climatic conditions of area. By monitoring and routing supervision the form, degree and scales of influence of the mining industry of Dashkesan-Kedabek economic region on environment with working out of the basic directions of elimination of negative influence are revealed.

Results and Discussion:

Negative influence of mining industry is very different and great to environment mountain. The mining industry Dashkesan-Kedabek economic region is based on an open way of working out of deposits and as the consequence of it is shown two basic sources of negative influence on environment. In the first, at an open career way of extraction of mineral resources and ores integrity of natural landscapes is broken and first of all it is the top belt of mountain forests and the Alpine meadows (fig. 3). At enrichment and ores in any way (flotation or chemical influence) by all means arise production wastes which with dead rocks occupy huge territories. Sailings of a waste completely supersede (destroy) natural vegetative covers, turning in a source of pollution of forests, agricultural grounds, water sources and atmosphere. Area of the Dashkasen territory of group of enterprises of iron ore is 1200 hectares. Ore was carried out with open method, 960 hectares of the territory connected with this, including 500 hectares consists of layers of unfit rock. These layers has been influence of the superficial waters showery rain and wind process of strong erosion forms ravines going. Tense of use of the mine about territories subject to get strong dirty. So, garbage’s thrown from the mine have destroyed the cover of plant being there forming cover in the mine surroundings around. Alunite ore are the basic raw material for aluminum industry. Alum deposits in the Dashkasen district gets up stands alunite were II in the world in the place after bed in the China rank. In structure of the alunite from the aluminum raw material salts of another potassium and natrium, sulphuric etc. There are cox stock reserve of great alunite in the were of alum deposits. Alunite taken out from here is been Ganja treatment processing as like semi finished product in the plant of aluminum clay after cleaning. Dashkasen organizes amounts territory of the alunite layers 300 hectares. Territory of the cobalt cultural layers organizes amounts 25 hectares. Usage with underground method of the mine has been a cause for the throwing to wide territories of the rocks. With a view of renewal of manufacture of colour and precious metals in 1990-2001 in Kedabek mines search works and an estimation of the maintenance of copper, gold and silver in a mine waste and parent (radical) breeds have been spent. Kedabek the enterprise for copper and gold manufacture occupies the space of 300 hectares, including the open-cast mine area on open-pit mining of ore of 150 hectares. At the Kedabek enterprise (“AIM Market Company”) on copper and gold manufacture the chemical method of extraction from ore of metals is used. Planned productivity of the enterprise of 1800 tons of the enriched copper concentrate in a year. In 2010 have been 182 tons of a copper concentrate, 1460 kg of silver and 26 kg of gold made. As well as a whole for the mining industry, for the Kedabek enterprise for a gold mining and copper two problems are characteristic. This problem of regeneration and restoration broken at an open way of extraction of ore of natural landscapes to a protogenic initial kind. The second problem is recycling of a waste of enrichment of ore by chemical way.

Conclusions:

Any wildlife management is connected with influence on environment. Operation of natural resources differs only intensity and in scales of consequences of negative influence. Results of monitoring have allowed to reveal the basic aspects of influence of the mining
industry on environment and to plan ways of their elimination. It is a problem of restoration of the broken landscapes at open-pit mining of ore and recycling of production wastes on enrichments of ore and empty rocks. Carrying out recultivations waste heaps by meadows woods planting are required. For wood implanting sailings of the mining industry use first of all native tree species (Quercus macranthera, Carpinus caucasica, Acer traytvettery, A. campestre, Sorbus caucasicus, Pinus hamata), and also tolerant introduce species (Pinus silvestris, Robinia pseudoacacia, Acer negundo, A. tataricum).

Fig. 1. Extraction alunita in the open way (above) and negative influence of production wastes on a natural landscape (below). Zejlik, Dashkesan area.

Fig. 2. Dashkasan group of enterprises of iron ore (above). Extraction of iron ore by open way (below, on a background) and a waste of enrichment of ore

Fig. 3. Dashkasan group of enterprises of iron ore (above). Sailings of rocks (above) and destruction of a forest cover (below)

References