

ANTHROPOGENIC THREATS ON LANDSCAPES IN THE VICINITY OF THE URANIUM MINE

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Mining is known to be one of the most anthropogenic threats for the environment, moreover if it is uranium mining. From year to year we observe the great growth of lands under mines and their infrastructures. Mining development obviously leads to numerous **lands subsidence, rocks slide, decrease areas of arable land**, etc. The arable areas had also greatly suffered from development of waste banks; pit refuse heaps, as well as from building of the earth dams, railways, roads, water reservoirs, etc. Saying that with the other words, the territories under mineral resources development are subjected to a power pressure on the environment with consequent significant and often critical landscape transformations as a result of imperfect technologies and management. The enormous contaminants emitted into the environment from different mining operations (starting from the ore extraction and up to the ore processing and transportation) have tangible effect on almost all the landscapes.

The mining industry development is accompanied by condemnation of considerable areas of agricultural lands. After temporal use the last ones are often transferred to a category of **an anthropogenic desert**. Next to each dumped fill of empty rocks a risk zone is allotted (the first one is 200 m, the second – 500 m) that leads to the significant loss of the land fund. Within such zones the atmospheric air is polluted, the soils are salinized and waterlogged that makes impossible to use them in agriculture. Considerable areas are occupied with the solid wastes from reclamation industry, namely with ash dumps, storage tales, sludge pits. They have a significant amount of toxic elements that contaminate the atmospheric air, soils, surface and underground waters of neighboring and remote landscape complexes [1].

Taking into account mentioned above the authors put the objective – to analyze the environmental stress on the landscapes for the territory about 30 km radius around the Ingulska mine which is the oldest uranium mine operating on the territory of Ukraine. For that purpose we analyzed series of remote sensing data: Landsat8/OLI – 11 June 2015, Landsat-7/TM – 12 July 2010, and Landsat5/TM – 11 July 2006. The following landscape types were analyzed and their description is given in the table (table 1).

Table 1

Landscape types analyzed in the vicinity of the Ingulska mine

Landscape Type	Landscape Description
Water bodies	Clear freshwaters of lakes, river Inhul and its tributaries Suhokliya and Biyanka
Coniferous forests	Woodland and forest dominated mainly by spruce (Picea) and pine (Pinus)
Deciduous forests	Woodland reflects the typical forest steppe ecosystem: forests and sparse vegetation, mainly maple (Sapindaceae), willow (Salix), lime (Tilia), oak (Quercus)
Natural grasslands	Herbaceous vegetation in pastures and hay meadows with significant areas of agriculture
Farmland	Plantations of sunflower, sugar beet, soybeans, winter wheat, maize with and houses adjoining sites
Open soil	Arable (chernozem) and barren (sand, clay) territories without vegetation cover
Industrial land	Housing (residential), industrial (mining) and commercial areas, characterized by asphalt, concrete, steel and slate cover
Roads	Transport network performed by railways and roads with asphalt and soil cover

Comparing classification of landscape types for the period of about 10 years of the mine operation (2006-2015) we can make a conclusion that the area of industrial and linear (road-cover) landscapes (including housing -residential, industrial- mining and commercial areas) has significantly increased. Water bodies' volume percentage has decreased. But on the other hand positive changes occurred within areas of natural vegetation cover. Further research will be directed on the same territory analysis but with the other space images and deeper understanding of natural resource management in the vicinity of the Ingulska mine.