GEOMORPHOLOGY

MILITARY ACTIONS AND ECOGEOMORPHOLOGICAL THREAT IN GARABAGH

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Abstract

The interaction between the natural environment and society has become complicated. Anthropogenic impact on the relief accelerates relief-forming processes. Military actions lead to disruption of the ecological situation. In mountainous areas, slope processes (landslides, rockfalls, scree, etc.) are activated. In Garabagh, vast areas are occupied by military fortifications. Trenches and ditches cause soil erosion. Forest destruction leads to plane washout. Military actions have led to active transformation of the relief. New forms of anthropogenic relief have been created.

The scale of damage (an area of more than 2 million hectares was affected) to the relief of Garabagh is great. There are still areas that have not been cleared of mines and have been subjected to man-made pollution. The current state of International Humanitarian Law is noted. Armenia purposefully used almost all types and kinds of weapons in the occupied territories of Azerbaijan. Minerals were exported from these territories.

1. Introduction

The authors of the article put forward and develop a new direction in domestic geomorphology - military geomorphology, which in turn is part of anthropogenic geomorphology, since man and his activities belong to the category of relief-forming factors.

The purpose of the work is to show the influence of military actions as a powerful environmental factor on geomorphosystems. We have studied the direct and indirect influence of military actions on our territories, previously occupied by Armenia for more than 30 years.

2. Methods and materials

Space images, photographs, literary data, data from military personnel and eyewitnesses were used, an analysis of military actions was conducted, types and kinds of military weapons were given, as well as their impact on ecosystems and, in particular, on the relief, and the damage caused by the war was considered.

The environment is a sensitive and multicomponent holistic system, where a change in one component causes a change in another.

The complicated relationship between nature and society poses ecological problems for many sciences, in the solution of which leading role belongs to geomorphology since relief is one of the most important natural components of the earth's surface and a condition for human life, which determines its ecological significance.

If natural factors form the relief of the earth's surface over many millions of years, then today man changes it almost instantly on a geological time scale [7].

Landforms created by man can be divided into: a) those consciously created by him and b) those that spontaneously arose during his economic activity. Landforms consciously created during human military activity are diverse. They differ in size, configuration and significance [11].

Anthropogenic and biogenic impact on the relief activate exogenous relief-forming processes that lead to changes both in the surrounding natural environment and in the system of engineering structures and communications. Knowledge of the factors, mechanism, dynamics, intensity and spatial distribution of these processes is needed for environmental forecasting [5].

If we consider that anthropogenic relief exists and that such a process of relief formation as anthropomorphogenesis actually exists, then the time has already come to highlight another fundamental scientific direction in geomorphology,

for which an organizational scientific structure should be created [13].

Currently, there are various landforms of anthropogenic origin of various sizes. The processes of their formation are compared with the processes of natural denudation, the volumes of soils moved by humans are calculated. As a result, the selection of material from the relief surface during its leveling, mining and in other cases is tens of times greater than the transfer of materials that occurs during the processes of natural relief formation. Denudation and accumulative forms of anthropogenic relief are distinguished. The need to study these forms can be associated with the need to make geomorphological forecasts [5].

3. Analysis and discussion

The relief is constantly changing under the influence of internal and external natural factors. However, the greatest influence on it is exerted by human activity, that is, the anthropogenic factor. One of the common types of anthropogenic influence is military activity.

Military activity is one of the leading ones in the system of environmental risks and security. The result of wars at all times is a belligerative landscape, which owes its origin to military activity (ancient ramparts, guard mounds, trenches, current craters, shooting ranges, etc.) [10].

Since the relief is the main component of the landscape, we can consider it belligerative.

In addition to the zones of direct destruction in Garabagh, vast territories are occupied by military fortifications. The relief here is changed for the purpose of defense. For example, defensive trenches and ditches were dug, and ramparts were erected where there were no natural barriers, ancient burial mounds (usually burial grounds and guard mounds) were destroyed.

Trenches and ditches, especially those of great length, cause soil erosion. Natural objects were often used as weapons, for example, cutting down or burning forests. Destruction of vegetation cover affects the reduction of animal world and a decrease in soil fertility. Forests are destroyed in order to deprive the enemy of shelters and livelihoods. Thus, territories can be transformed into desert lands [1].

According to the topic of the article, we believe that in this case, applied geomorphological research should be provided with knowledge of military operations, weapons and their consequences.

Everything that is part of the arena of military operations - the hydrosphere (Navy), the atmosphere (Air Force), the surface of the lithosphere (ground forces), covers the territorial geoecological limits of the military sphere. All three of these components are the geoecological environment. This theory reveals the scientific aspects of a new direction that we have named military geoecology [8].

There are many types of military weapons. We do not intend to list and characterize them, which would take more than one page and this is not our goal. We will only briefly limit ourselves to the development and dissemination of legal documents regulating the use of individual types of weapons.

It should be noted that one of the main tasks facing the armed forces of countries is environmental protection. However, specially organized military actions are undertaken that contradict their own Charter, in order to worsen the environmental situation.

International humanitarian law (IHL) is aimed, first of all, at reducing the suffering caused by armed conflicts. To achieve this goal, IHL regulates both the behavior of combatants and the choice of means and methods of warfare, including the choice of weapons.

Without going into the history of IHL treaties, we will only note the current state of IHL.

Thus, the 1980 Convention prohibits the use of munitions that cause damage by fragments that are not detected in the human body using X-rays, as well as blinding laser weapons. It limits the use of incendiary weapons, mines, booby traps and other similar devices. The 1997 Convention prohibits the use of anti-personnel mines. More than ¾ of the world's states have acceded to this convention. In 2008, 107 states signed a similar Convention on Cluster Munitions. It is known that nuclear weapons are superior in destructive power to all other types of weapons, but their use is not prohibited by international law.

The long war (more than 30 years) has caused great destruction. The long-term confrontation has developed a certain model of relations - double standards, Islamophobia, pan-Turkism, revanchism.

The occupied territories were an arena for military operations, the relief served mainly for the transportation of military equipment. In order to protect against attacks, defensive ramparts and structures in the form of ditches were built. In this regard, the relief has been greatly changed. Military operations using modern technology have led to an increase in the negative consequences of military activity and an active transformation of the relief.

The 3-4 echelon systems of defensive fortifications built along the contact line called the "buffer zone" also significantly changed the terrain, complicated it with barriers, trenches, fortifications, bunkers, tunnels and other defensive structures. If we add to this the excavations for the placement of tanks, Grads and other hidden military equipment, we can see the scale and intensity of the change in the relief content of the territory. On every square kilometer of the part of a sloping plain at the foot of the mountains, in the direction of Fizuli-Jebrail-Hadrut, very deep ruts are observed.

The same picture can be seen on the hills around the villages of Gulistan, Talysh, Sugovushan, in the moderately dissected parts of the Tonashen, Gulyustan and Kecheldag lowlands located in front of the Sarsang reservoir. In the overwhelming majority of tunnels and observation posts excavated here, no consolidation measures were carried out, which are part of mining operations, which will inevitably lead to destruction in the near future and as a result, new forms of relief of anthropogenic origin will be created.

Of particular note are the more than 10-kilometer excavations of tunnels, bunkers and trenches, as well as other engineering fortifications built in the direction of Agder, even in mountainous areas. In the shelters and fortifications underground, warehouses were discovered that provided the militants with the necessary ammunition and food for a long time, as well as the extent to which this area was subjected to anthropogenic impact during the formation of communication lines [3].

When constructing multi-meter thick walls, tunnels, bunkers and observation posts built in the highlands, concrete and other special-purpose building materials were used, and additional roads were built for their transportation by special vehicles. This is one of the factors leading to the intensive dismemberment of the relief.

The scale of damage caused to the relief of Garabagh by military actions is so great (more than 2,000,000 hectares) that 30 years later there are still territories that have not been cleared of mines and have been subjected to man-made pollution [2].

The above determines a powerful military factor influencing the movement of significant masses of people (1 million refugees) and weapons (hidden weapons depots were discovered in the area after the war), the use of toxic substances, fires that poison the atmosphere, flora and fauna. Artillery caused serious damage to the relief - numerous craters remained, the vegetation and soil cover was damaged.

It follows that military actions are accompanied by the destruction of natural and natural-anthropogenic objects, pollution of the environment with chemical, biological and radioactive substances.

It should be especially noted that Armenia purposefully used almost all of the above-mentioned types and kinds of weapons in the occupied territories of Azerbaijan. We are very concerned that it is rapidly developing its nuclear energy. Proof of this is the burial of radioactive waste in our occupied territories [9].

But it used some of them during military actions.

Thus, according to military personnel, Armenia, under very hidden conditions, released poisonous cartridges containing lead and silver iodide into the atmosphere of Azerbaijan using airplanes. These substances, having reached the surface of the earth, cause great harm to living organisms. It was also engaged in creating turbidity in the lower layers of the atmosphere at the right time for military purposes. The Armenian occupiers burned forests and crops, which led to an environmental disaster. While conducting military operations, they used biological and bacteriological weapons on our territory with the aim of destroying and polluting soil, water, plants, animals and food sources of the population.

Military actions caused great damage to 2 reserves and 4 wildlife sanctuaries of Garabagh, especially the Basitchay Reserve, located in the Zangilan region [3].

Thus, the relief of the territory of the Kelbajar region of Azerbaijan, which is the largest in area and rich in natural resources, which was under occupation during 1993-2020, has changed greatly. The lands of the eastern foothills of Mount Ketidag have become unusable due to predatory gold mining. Artificial lakes were created in the cultivated lands of the villages of Byazirkhan and Zar for the purpose of gold washing. As a result, the soil cover and cultivated areas were destroyed. At the same time, when washing, using harmful chemicals, the wastewater and the relief of the territory were polluted.

The felling of a huge number of trees in the forests led to surface washout, which in turn led to landslides, avalanches and soil degradation.

A huge number of buried mines on roads and pedestrian roads, as well as cultivated areas, formed deep pits and depressions.

Mines were buried along the entire length of the Murovdag ridge, the explosions of which led to the destruction of rocks, avalanches and landslides. It should be especially noted that the demining of the occupied territories also causes great damage to the relief. Similar processes occur during the excavation of trenches and fortifications along the entire front line (Fig. 1, Fig. 2).

Figure 1. Military facilities around the village of Bazirkhan in the Kelbajar region

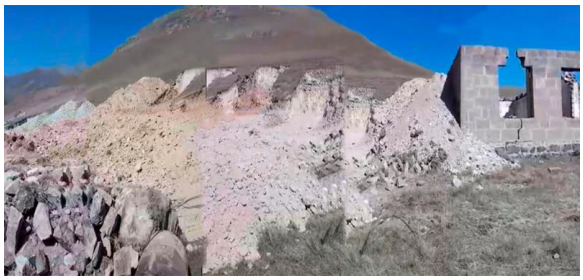

Figure 2. A trench dug near a house in the village of Bazirkhan in the Kelbajar region

The participation of troops in the military conflict in Garabagh, equipped with such powerful equipment as the Osa SAM, RS30 BM-21 (Grad), D-30, D-20 and D-44 howitzers, 2A36 Giatsint-B guns, 120 mm mortars, Konkurs and Fagot anti-tank missile systems (ATGM), etc., led to the disruption of the ecogeomorphological system [13]. There are 167 mineral deposits and 120 healing mineral springs in Garabagh, which were also monstrously exploited by the Armenian aggressors. These are mainly gold, silver, copper and mercury. Among the mineral springs, the following are particularly noteworthy: Yukhari Istisu in Kalbajar, Ilygsu and Minkend in Lachin, Turshsu and Shirlan in Shusha, which account for 39.0% of the total geological reserves of mineral waters in Azerbaijan [6].

The minerals of the occupied areas, mined at 2 gold-bearing, 4 mercury, 2 chromite, 1 lead-zinc, 1 copper and 1 antimony deposits, were transported to the enrichment plants of Armenia [4].

As a result of military actions, negative changes in the environment occurred in the study area, threatening human health, the state of natural ecological systems, and the genetic fund of Azerbaijanis.

During the period (1992-2023) of our Patriotic War, 20% of the area of Azerbaijan was covered by military actions, i.e. 17.3 thousand km², during the war more than 15,000 people died [15].

Military actions by Armenia caused irreversible changes in our environment, accompanied by human and material losses, violated the environmental safety of our state.

Missile and bomb strikes led to powerful fires and destruction, dangerous pollution of air, soil, water with toxic chemicals of our territory.

In our opinion, military actions with serious environmental consequences prompted public opinion to take the side of environmental protection, and to initiate a broad environmental movement in our country.

4. Conclusions.

- We declare the territory under study a zone of environmental emergency.
- The powerful destabilizing environmental situation caused by the military intervention led to the fact that the relief of the territory under study has changed significantly.
- It is advisable to further strengthen the activities of the Ministry of Ecology and Natural Resources, state and non-governmental organizations for the protection of the natural environment and to expand the activities of public environmental movements.

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QARABAĞDA HƏRBİ ƏMƏLİYYATLAR VƏ EKOGEOMORFOLOJİ TƏHLÜKƏ

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Xülasə. Təbiət və cəmiyyət arasındakı münasibətlər getdikcə daha da mürəkkəbləşir. Antropogen təsir relyefəmələgətirən prosesləri aktivləşdirir. Hərbi əməliyyatlar ekoloji vəziyyəti kəskin pozur. Dağlıq ərazilərin yamaclarında gedən proseslər güclənir (sürüşmə, uçqun və s.). Qarabağda geniş sahələri hərbi istekamlar tutur. Səngərlər torpaq eroziyasını, meşələrin məhvi isə səthi yuyulmanı yaradır. Hərbi əməliyyatlar nəticəsində relyef aktiv transformasiyaya uğrayır, yeni antropogen relyef formaları yaranır. Qarabağın relyefinə vurulan zərərin miqyası 2 mln.ha artıq sahəni əhatə edir. Bu günə kimi minalardan təmizlənməmiş ərazilər texnogen çirklənməyə məruz qalıb. Beynəlxalq humanitar hüququn müasir vəziyyəti təhlil olunur. Ermənistan məqsədyönlü olaraq əsasən bütün növ hərbi silahlardan işhal olmuş Azərbaycanın Qarabağ ərazisində istifadə etmişdir. Burada təbii sərvətlərimiz daşınaraq aparılmışdır.

Açar sözlər: Qarabağ, hərbi əməliyyatlar, antropogen geomorfologiya, belligerativ landşaft, hərbi silahlar.