Lithological And Geomorphological Structure Of Sandy Soils Of Central Fergana

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ABSTRACT

In this article, the lithological and geomorphological structure of the sandy soils of Central Fergana was studied. Properties and characteristics of sandy soils, genesis, and chemical, agrochemical, physicochemical and ecomeliorative changes occurring in sandy soils under the influence of anthropogenic factors were studied

Keywords: Anthropogenic factor, sandy soils, mountain range depression, Ferghana Valley,

Introduction

Scientific research was carried out by Republican and foreign scientists such as A.F.Middendorf, A.N.Rozanov, V.P.Drobov, A.I.Ioffe, M.A.Pankov, F.F.Mujchinkin, O.K.Lange, S.G.Zaozerskiy, Q.M.Mirzajonov, R.Q.Qo‘ziyev, G‘. Yuldashev, G‘.T.Parpiyev, S.Zokirova, Lubomir Lichner, Paul D. Hallett, Volkhard Scholz, Shinji Suzuki, Sawaeng Ruaysoongnern and others from to identify chemical, agrochemical, physicochemical and ecomeliorative changes taking place in sandy soils under the influence of the texture and properties, Genesis, the anthropogenic factor of sandy soils, to assess soil fertility and protect them. According to the scientific works of O.K.Lange and I.E.Minakova and others, the sedimentation of the intermountain range of the Fergana Valley is divided into four major geomorphological regions [1-11].

Its central lowest part consists of plains, surrounded on all sides by a system of mountains of three different heights. The highest of the mountain range are high mountains, their absolute height exceeds 2000 meters. Below them is a range of mountains of medium height, with a height of 1000-2000 meters.

Middle and high mountains are composed of deposits of the Paleozoic and Mesozoic eras, such as sandstones, clay shales, various limestones, sandstones, gypsum and conglomerate. Between the central plains of the valley and the mid-elevation mountains is a hilly region composed of conglomerates, sandstones, clays, and marl. Hill ranges, medium and high mountain ranges are distinguished by inter-hill and inter-mountain depressions.

The Ferghana Valley is the central part of the tectonic sedimentation and resembles an ellipse-shaped hearth extending in the direction of latitude. The different forms of relief present here are divided into 3 genetic

types: erosion-accumulative, accumulative, and eolian-accumulative.

The erosive-accumulative relief consists of pre-mountain slope plains consisting of conical expansions of mountain gorges. The absolute height of the Shakhimardon-Isfayram conical expanses from the sea level in the peripheral part of the cone is 420-430 meters. The head of the cone is located above 470-475 meters. The slope varies from 0.002 to 0.01.

The relief of the accumulative type is the flat part of the valley, which consists of modern (Kyr and Upper Kyr) and ancient (Tertiary) Supachai of the Syr Darya. The surface of the spa is very flat, and the general weak slope is in the north and north-west direction and is equal to 0.0005-0.001.

Sand deposits of Central Ferghana are included in the sand-cumulative type. The relative height of relief formations consisting of sand piles such as dune, dune-top rows and barkhan is 3-10 m, sometimes 15 m wide, 10-50 m long, and 50-100 m long. The soil-forming rocks distributed in the Fergana Valley mainly consist of the following:

1. Eluvial deposits are found on flat tops of mountains and hills. They are deposits formed in place of weathering products, that is, in the weathering shell.
2. Diluvial deposits are deposits consisting of mostly soft and small particles of different thicknesses formed by the flow of rainwater and melted snow at the foot of the slopes of mountains and hills and other similar hills. Diluvial deposits are found everywhere with uneven topography.
3. Proluvial deposits are formed in the hilly part of valleys between foothills and mountains. Almost all of the rock formations in the valley, consisting of a mixture of various mechanical elements, such as stone, gravel, and sand, where proluvial heavy rains and floodwaters have accumulated, are such proluvial deposits.
4. Alluvial deposits were formed as a result of the activity of permanent running water in river and stream valleys. Alluvial valley deposits occupy a large part of the valley plain. A characteristic feature of these deposits is the fine sorting of mechanical particles. The second feature is that it is layered in various large and small sequences.
5. Marine Deposits Since the Fergana Valley was covered by the sea in the distant past, marine deposits or sedimentary rocks are common, but they are mainly distributed in the plains in the centre of the valley.
6. Lake and swamp deposits. Lakes and swamps were widespread in a large part of Central Fergana until about 50-60 years. The construction of large main collectors such as Sariksuv, Yozyovonsoy, Karajuga, and Northern Baghdad caused the formation of lakes and swamps. Their deposits are characterized by heavy mechanical composition and richness in various salts.
7. Aeolian (wind) deposits. Wind activity of the atmosphere is strongly developed in Western and Central Fergana. As a result, piles of sand of different sizes mixed with different amounts of dusty and silt particles were formed in large areas. Wind deposits are mainly sands formed by long-term erosion of proluvial and alluvial deposits, which also form plains. Sandy soils were formed in consolidated conditions, that is, in places densely covered with plants. In shifting sands, the process of soil formation is not observed.

The object of our research: It is located in the sand dunes formed by the wind of Central Ferghana. The absolute height is around 425-430 meters. The relief consists of rows of sand dunes, dunes. Their relative heights reach 3-8 meters, sometimes 10-12 meters. The rows of sand dunes are interspersed with depressions and are occupied by salt marshes. The lithological structure of the lowlands includes sand, loam, sand and clay. Soil-forming rocks mainly consist of wind deposits.

Results and discussion

The geological structure of the research area and the main features of the relief are first of all inextricably linked with the geological-geomorphological structure and development history of the Fergana Valley. The Ferghana Valley is one of the regions that has undergone the strongest changes from a geoecological point of view. It stands out as one of the

regions with high anthropogenic pressure in the republic due to favourable natural conditions and relatively high availability of resources, dense population, large number and density of settlements, industrial development, intensive farming with 2-3 times the yield from the land.

Central Fergana itself is concave in shape and is bordered by tectonic breaks and faults on almost all sides. The flat part of the Fergana valley is a tectonic depression formed as a result of the subsidence of the earth's surface. It was formed by the uplift of the surrounding mountains during the Herzenian and Alpine folds that occurred in the Paleozoic era.

During the Mesozoic era, a large part of the valley was covered by seawater. This sea became a gulf during the Paleogene period. During the Neogene period, the mountains around the valley rose again and became "rejuvenated", the sea receded. A closed lake remained in Central Fergana until the end of the Neogene. According to Gabrielyan (1948), in the Quaternary period, new tectonic movements occurred in the mountains as a result of the Quaternary folding phase, and in Central Fergana, the subsidence process that began in the Neogene period continued and a thick layer of sedimentary rocks was formed.

In the area, sands of the age of the Mirzachol (Upper Pleistocene) and Syrdarya (Holocene) complexes, as well as sand, loam and clay of the Syrdarya complex are found. There are sands with small particles of dark, pale, pale and grey colours. They contain quartz, limestone, gypsum, biotite, black shale, and hornblende [7-11].

Dark sands contain more biotite, hornblende, and shales, while light-coloured and light-coloured sands contain more feldspar. Gray sands have equal proportions of the above minerals. In conditions where groundwater is close to the earth's surface, the lower horizon of the sands is bluish-grey in colour. Small particles of limestone are often found in such sands. Gypsum crystals can be observed in dunes and lowlands between them.

In the natural monument area of Yozhiovon district, there are mainly fine-grained sands. In them, 0.50-0.05 mm particles make up 80-85 per cent, 0.05-0.01 mm particles make up 1-7 per cent, and clays make up 0.5-2.5 per cent. The chemical composition of sands in the area of natural monuments differs from the composition of sands in other regions. For example, silicon does not have a large share in the sands here. They contain relatively more carbonates, feldspar, and shale. A certain amount of potassium salts is characteristic of sands. Aeolian relief was formed under the influence of wind in the sand dunes in the area of the natural monument. Here, barkhan-dong, dong-marza sands and depressions of different sizes are observed.

Barkhan-dong is one of the typical landforms of shifting sands. They developed in the southern and northern parts of the monument, in areas with strong anthropogenic influence. Barkhans are usually found singly in some places. In other places, they have turned into barren sands. The shape of the moving dunes is similar to the shape of a sickle or a new moon. Its slope on the windward side is steep, and its leeward side is steep. It has two branches in the direction of the wind, and the slope near it is steep. The height of barkhans ranges from 1 meter to 10-15 meters. The bottom of them does not move from one place, but the sand on the top is blown by the wind. Depending on the direction of the wind, the sands of the barchan can move to one side or the other.

After vegetation grows in the dunes, sand shifting stops. The plants first grow in the lowlands between the dunes. In this way, the vegetation strengthens the dune sands and turns them into another landform, i.e. dune sands. The direction of barkhan sand stretches from northeast to southwest in accordance with the direction of the wind. These sands can be included in the group of semi-solidified sands. Frosty sands are widespread in a large part of the region, especially in its central part. These sand relief forms are sand dunes with a relative height of 4-6 m, supported by narrow sand margins extending in the direction of prevailing winds.

Between the sand dunes, in accordance with their direction, there are undulating lowlands, in the lowlands where the groundwater is close, swamps and small lakes have formed. In

the western part of the monument area, there are saline lowlands. It was formed due to the alluvial release of sands, the flow of sand materials by proluvial and alluvial flow, and partly by the drainage of irrigation water.

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