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Research Article

EVOLUTION OF IRRIGATED SOILS "CENTRAL FERGANA" UNDER THE INFLUENCE OF ANTHROPOGENIC FACTORS

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B.Umarkulova
Assistant, Fergana Polytechnic Institute, Fergana, Uzbekistan

ABSTRACT

It is known that the study of the historical development of soils is an important task in determining the direction of changes in their cross-section and thereby developing a system of integrated measures to address many issues, such as their conservation and productivity, improvement and rational use.

The historical development of soils means that the already developed full-profile soils change in connection with the evolution of the whole natural environment. In this case, one genetic type or type of soil can pass to another genetic type or type. As a result, the characteristics of the previous soil formation stage in the soil profile gradually begin to fade or transform, and new characters are formed in accordance with the new stage of soil formation.

KEYWORDS

Soils, Ecological conditions, genetic layers, irrigation, Nutritious soils, gypsum, ecological factors

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INTRODUCTION

The soils of the Central Fergana Desert, which began to be developed in the 30s and 50s of the last century, underwent extensive changes under the direct influence of the human factor, and, like other properties, acquired a different morphogenetic structure than its stable period.

In Central Fergana, the first scientific-analytical data on soils with layers called arzik in the local language were obtained in studies conducted by F.A.Popov, A.A.Mentsi and K.M.Klavdienko and preserved in the manuscript form [10]. This information was later repeated in the monograph "Soils of Uzbekistan" [12], in the works of A. Maksudov [8, 9], MA Pankov [12] and others. In the works of VA Kovda [6, 7] there is information about the accumulation of gypsum and carbonates and water-soluble salts in the lands of Central Fergana and the formation of gypsum crusts in the drying salt lakes. In the study, nutrient soils were studied in the composition of the regional soils of the region. After its development, several problems arose during irrigation and farming. After that, nutritious soils, with the demand for production, were divided into separate groups, the genesis, properties and ways of reclamation were studied at the type level [5]. Recent studies have shown that the genesis of soils formed in the region over time, the study of their gradual development, these soils are formed and developed under the influence of specific factors [3, 4].

THE MAIN PART

It is known that the study of the historical development of soils is an important task in determining the direction of changes in their cross-section and thereby developing a system of integrated measures to address many issues, such as their future conservation and productivity, land reclamation and rational use. The stage of soil formation and development for a particular area is characterized by the formation of its genetic layers within a particular soil type and its specific properties and characteristics, as well as a stable level of fertility. Changes in ecological conditions lead to changes in the geochemical properties of the soil through it to the stage of historical development [5-9] and, consequently, to the genetic layers in the soil cross-section, its natural properties and characteristics begin to change and lead to an increase in the level of natural fertility. Accordingly, the properties of the soil can be divided into three groups: the "residual" properties inherited from the parent rocks during the formation of the soil, the properties of the soil in the stable period of the ecological environment, and finally the properties of the evolutionary development of the soil [10-14].

Thus, the historical development of soils means that the already developed full-profile soils change in connection with the evolution of the whole natural

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environment. In this case, one genetic type or type of soil can pass to another genetic type or type. As a result, the characteristics of the previous soil formation stage in the soil profile gradually begin to fade or transform, and new characters are formed in accordance with the new stage of soil formation [15-17]. Environmental factors that have been in balance for centuries have been disrupted as a result of man-made, irrigation, and other widespread impacts, and the soil cover lying in a protected state has undergone extensive changes [17-19]. Such changes are particularly noticeable in Central Fergana in the following areas:

- Levelling of uneven lands in the state of natural protection;
- Irrigation of lands, the introduction of irrigation water, ie the deposition of suspended muddy rocks and salts;
- Changes in the water-salt regime through the construction of collector-drainage complexes;
- Complex measures such as tillage systems, crop rotation in the planting system, fertilization systems;
- Saline washing and other similar hydro-ameliorative and agromeliorative conditions;
- Secondary salinization, increased density of the underlying drive layer;
- Acceleration of the process of dehumidification at the initial stage in newly developed lands, etc.

The irrigated soils of Central Fergana, which were selected to study changes in the genetic layers of soils, are mainly nutritious meadow soils that have been developed after the 30s and 50s of the last century. This cross-section of soils differs from the cross-section of grassland soils in the region by the formation of specific layers, gypsum, loamy, loamy, gypsum-loamy, loamy loam, and the appearance, structure, quantity, morphology and micromorphology of these formations. The cross-sectional structure and morphology of nutrient soils are drastically different from other soils in the region. In the cross-section of their soil and subsoil rocks, a clear stratification of chemical elements and substances in accordance with the law of their migration and accumulation is observed. Nutrient soils Calcium and magnesium carbonates accumulate in the lower part of the soil-soil section, gypsum and carbonates in the middle, and gypsum and water-soluble salts in the upper part. The accumulation of large amounts of these compounds has formed their respective suitable layers - loamy, loamy, gypsum and loamy strata, and in this connection, the soil section of loamy soils has a three-layered or three-tiered structure. The top layer of the cut is referred to as the topsoil or topsoil layer. This layer is composed of fine-grained soil mass in shallow and deep nutrient groups, which can contain up to 10% gypsum. In the topsoil categories, the upper part of the cut consists of a layer of gypsum that retains 20-30% or more of the gypsum. The layer also contains water-

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soluble salts, salinity levels vary from weak to strong and salinity levels. The middle layer of the nutrient-rich soil section consists of two, three, or more nutrient layers, which can contain 10% to 70% gypsum and 15% to 40% carbonates. The nutrient layers also contain different amounts of lightly soluble salts, some of the salts are located inside gypsum crystals and food derivatives. The nutrient layers are densely bonded, and within the layer are often also cemented layers of varying degrees. Their aeration porosity is very small and their ability to conduct and retain water is poor. The lower part of the section is a layer of sand, composed of concrete, monolithic or fragmented cemented and hollow layers. 30-60% of the composition of the strata is calcite, dolomite, magnesite and other carbonate and sulfate minerals. Protected fertile soils are located in the late 70s of the last century in the north-western part of the Isfayram-Shohimardonsoy adjacent distribution cones and small areas within the irrigated lands of the lake-proluvial plain and the sandy complexes of sandy plains [3]. At present, almost all areas with fertile soils are included in the scope of irrigated agriculture. The ecomeliorative condition of the developed arable lands in the study area and the structure of the soil cross-section have changed widely depending on the length of the irrigation period, the complex of reclamation measures applied, and the intensity of farming, etc. Later, the rate of change has changed, and now the changes in them are accelerated under the influence of irrigation, in contrast to those in the reserve soils, but continue to be slower than in the early stages of development. The scale of the changes over the next 30-40 years is reflected in changes in the shape of some components in the cross-sectional structure, such as quantitative changes along with their cross-sectional layers, and the chemical composition of the soil.

CONCLUSION

According to the above, the anthropogenic factor in the course of changes in the soils of "Central Fergana" triggers a stable period in the historical development of soils, without affecting certain factors of soil formation and development (climate, age), other factors (parent rock, relief, flora and fauna) acquires specificity by manifesting itself as a driving factor in active change. Now, the movement of this factor in the right direction can serve as a solution to the problems of soils in the area.

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