

CHANGES IN CENTRAL FERGANA SOILS UNDER THE INFLUENCE OF PLANNING

U.B.Mirzaev

Candidate of Biological sciences Ferghana state university

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Abstract. *This paper describes the changes in cross-sectional structure as a result of land leveling during the comprehensive development of the Central Fergana reserve soils by the human factor.*

Keywords: *anthropogenic factor, land leveling, relief, gypsum, sediment, carbonates.*

In the conditions of irrigated agriculture, the natural flow and direction of soil formation is disturbed. Agrotechnical and melioration activities such as land leveling, plowing, irrigation and salt washing, drainage, fertilizer application, performed by the anthropogenic factor, have a strong influence on the structure and properties of the soil. As a result, there are new conditions of soil formation, which are drastically different from the conditions of its natural course. The fate of soils in new conditions depends on the correctness, quality and farming culture of the set of measures used.

V.V. Dokuchaev wrote that: "Soil is a constantly changing function of the following factors: a) climate (water, temperature, oxygen, carbon dioxide in the air, etc.), c) parent rocks, c) plant and animal organisms, especially the bottoms, d) the relief and the height of the place, and finally, e) the soil and partly the geological age of the land...". But V.V. Dokuchaev could not show human production activity as a soil-creating factor. Man's influence on nature, including the soil, is huge. A.A. Rode (1948) in his monograph "Process of soil formation and evolution of soils" published on the occasion of the 100th anniversary of the birth of V.V. Dokuchaev, deeply analyzed the process of soil formation on the basis of the achievements and conclusions of the science of soil science. included surface and underground water, human economic activities among the soil-generating factors. The soil has undergone enormous changes since man settled down and mastered the cultivation of crops. Man's farming, irrigated farming activity has a history of almost 7000 years (Minashina N.G., 1978). According to Academician V.V. Bartold (1914), Central Asia, especially Uzbekistan, is a very ancient region of irrigated agriculture. Its history is 4 thousand years old. According to O.A.Rijkov (1958), Andijonsoy, which has its own valley and levees, is an artificial channel, which was dug by hand three thousand years ago.

Humans and powerful tools at their disposal - machines, fertilizers, irrigation, ditch systems, chemical plant protection products, industrial wastes and pollution have changed natural ecosystems and their balances. Natural soils have undergone such changes during their use in agricultural production that, as a result, they have increasingly turned from the object and subject of labor into a product of labor. (Pochvovedenie, 1 vol., 1988). More and more soil cultivation, deep planting, organic and mineral fertilizers have changed not only the chemical, physical and biological properties of the soil, but also the external morphological appearance.

The pre-mountain plains of the Fergana Valley have undulating relief, and in ancient times, farmers adjusted irrigation to the meso-relief of the place with the help of furrows and furrows. In

this way, they did less leveling work. But still microrelief and partially mesorelief elevations were cut by hand and the cut soil was laid on lowlands (Stets V.M., 1949).

Soil fertility in newly developed lands is directly related to land leveling. In the high places of poorly leveled areas, salts accumulate in large quantities, and in the low places there is an excess of moisture, in both cases the plants suffer, wither and dry (Komilov O.K., 1985). In areas with poor soil, improper land leveling makes the soil extremely infertile.

There are two main types of leveling: 1) The land is leveled by eliminating individual hills and valleys while maintaining the general natural slope of the place. This type of land leveling can be widely used in areas where the soil is not saline. 2). Alignment of fields in the form of stair-step horizontally aligned cards. In this type of land leveling, the fields are leveled horizontally, the natural slope is eliminated, and they are separated by permanent borders or temporary ditches in a step-like manner according to the general slope. When leveling saline soils, it is necessary to use this type of leveling, which has been experienced by farmers for many centuries.

There are many methods of land leveling, the most common ones are 1) continuous cutting of hills and high places of the field and filling low places 2) strip (kulisa) method of cutting hills and heights and filling low places. In the first method, the upper layers of the soil are cut. In the second method, one part of the elevations is cut in the form of a strip, and the other part is leveled. 3) The humus layer on the surface of the soil is pushed and collected, then the soil under it is cut and the elevations are leveled. Then the previously collected humus soil is spread over the leveled surface.

Usually, there is a certain correspondence between the surface of the soil layers and the relief of the earth's surface. This compatibility is also maintained at the depth and level of the seepage waters. Precipitation and accumulation of gypsum and other salts past the saturation level is strong at the upper limit of capillary rise. The capillary bed oscillates in response to changes in the water level, and because of this, the gypsum accumulation belt is stretched across the section. The upper limit of the gypsum belt is at a certain depth from the earth's surface, it is deeper in the bubble elements of the relief, and it is on the surface in depressions.

It is known that the surface of the Shokhimardon-Isfayramsoy cones is characterized by the alternation of flat radial elevations and radial wide (concave) depressions, and the prevalence of meso- and microrelief forms for the central depressions of the cones and the lake-proluvial plain. During the development of the territory, large-scale land leveling works were often carried out without following the rules of land leveling. The convex elements of the relief are cut, and the concave elements are buried. As a result, unproductive fertile layers were exposed on the heights and elevations, and the soil layer of the depressions was covered with rocks consisting of soil, gypsum and sand or a mixture of them. Unproductive layers of the soil section, including birch, arctic, gley-mud, bedrock, are exposed. The soil cover is heterogeneous due to the non-uniformity of fertility, physical-water properties, and the shape and density of remedial crystals across the cross-section and individual layers. Gypsum layer consisting of fine and small crystals of gypsum and its derivatives (gypsum can be amorphous) is formed closer to the earth's surface or, according to its characteristics, is strongly scattered (oligo flagellum). Farming in the described conditions is extremely difficult.

The dissolution of gypsum contained in the soil in water, even if it is a small amount, develops suffocation processes. There are suffuses, pits, underground waterways and other suffocation spaces. Sinking of water troughs, deterioration of concrete linings in canals, cracking

of asphalt roads, water in canals, ditches or marzas seeping into the ground and disappearing are common. In the area where gypsum and clay soils are spread, the leveled areas will become uneven in a short time. This increases the volume of current leveling and requires frequent re-leveling.

Meso- and micro-forms of the relief were very characteristic for the northern periphery of the conic plains and the lacustrine-proluvial plain, before the area was subjugated, and they created the complexity of the soil cover. The accumulation of carbonates and sulfates in different qualitative and quantitative forms and at different depths across the soil cross-section adds to the complexity. As a result of land leveling during development, elevations were cut and hollows were filled. As a result of non-compliance with the rule of maintaining the fertile soil cover during land leveling, unproductive rich and fertile layers, subsoil rocks were exposed, unproductive rocks were laid on the surface of the leveled depressions. Even within small contours, soil condition, mosaic in terms of productivity has occurred. This situation is preserved in most of the irrigated areas. The color of the growth and development of plants also indicates the condition of the soil. Leveling of soil fertility and improvement of land reclamation is required in fields with poor soil conditions. This can be achieved by applying agrotechnical and agromelioration measures.

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