Chapter IV

# Developmental Factors of Irrigation Erosion and Ways to Combat it

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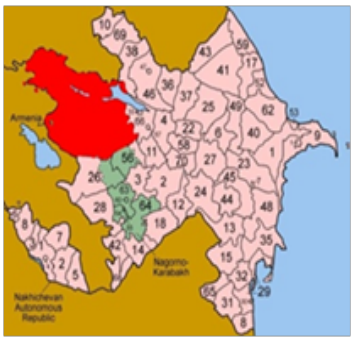
## Introduction



As is well known, each of the irrigated planting areas of the republic has a lot of clarity, while plain zones (Kur-Araz lowland) are relatively low. In addition, the majority of the areas are also chosen for superficiality, and they are distinguished by the upper, middle and lower parts of the field. The majority of areas are ridiculous, as well as barren. This type of irrigation water is used to irrigate irrigated land for uneven distribution. Thus, the soil moisture is damaged. In addition, important non-essential nutrients needed for cultivation in plants that are not smearable are not the same, and thus the nutrients of the plants are affected by the same nutritional requirements of the same plants. The above-mentioned deficiencies prevent the plants from buying fixed and high-yield products. Thus, washings in areas are intense. Therefore, it is desirable to smooth surface finishing in the irrigated planting areas. In general, the surface finishing operations are divided into two parts, both basic and current. The current leveling works begin every year for land preparation and they do not require substantial funds and expenditures. Baseline smoothing works should be carried out at a time when substantial improvements in the irrigated planting areas are required. Sowing areas are grouped by mail for work. So there are very few areas where maility is 0.001 and no mailboxes with 0,001-0,025 mail area, mail area with 0,002-0,0075, medium-sized fields, from 0,0075 to 0,002 mail with many mailboxes, 0, Areas with a range from 02 to 0.005 are very large, and areas with a density of 0.05-0.01 and above are heated. For each irrigated planting area, the surface is determined by spraying. To this end, the landlord must be aware of the nature of the fields in which he / she is in contact with the relevant specialist. If the message area of the area belonging to it is more than 0.01 (the difference in height from 100m to 1cm) then it is necessary to carry out the first and subsequent current leveling works in such areas. For this purpose, the necessary preparatory work should be done. For this purpose, based on the geodetic plan, horizontal and vertical lines of up to 10 cm (in particular, in the case of smoothing) should be drawn and a drafting draft should be drawn up. In the business plan, the scope of the work, the areas to be cut and filled, the direction of the soil, the distance of the relocation and so on should be indicated. In the substantial smoothing it can be used scraper, bulldozer, then special smoothing mechanisms (PT-4, PT-2, 8) and PT-4A, PS-2, 75, PD-5 and so on in current smoothing works. In all cases, the thickness of the soil should be taken into consideration in any area. At the same time, it is necessary to avoid the degraded layer of nutrients (decomposition, nitrogen, phosphorus, potassium) necessary for growth and development of the plant. The cut-off humus layer should be used later on. At the same time, the landlord has the right to use the simple equipment (eg, iron, iron, etc.) placed in the special sowing aggregates after the first (ice cream) or second (repetitive) sowing in the areas where the seeds are sown in the same way as they do not have the necessary smoothness, etc.) Do the current smoothing on the site. In all cases, it is important that you do not have more than 0.01 field mail. In such a way, the areas are primarily liberated from permanent and temporary ditches.

Thus, it is possible to increase the length of the spruce in the vegetation areas and to increase the length and width of the irrigation strips in plant growing areas. Thus, irrigation erosion can be significantly overcome in the irrigated planting areas selection of water consumption. As you know, the soil cover of our republic differs by its thickness. The relatively moderate (30-50 km) and thick (more than 50 cm) soils are mainly found on low prone slopes (slopes), while the inclined slopes (up to 30

cm thick) have been developed. In such areas, soil is small in contours (sometimes 10-20 ha) and it is not possible to carry out substantial smoothing works in the sloping areas. The main purpose of irrigation in such areas is to consider the use of irrigation water. For this purpose, first of all, it is necessary to determine the irrigation rate. To do this, you need to know the depth of the active layer (depending on the nature of the plants), the mass of the soil, the moisture content of the soil after irrigation to the soil moisture before watering.

After determining the water norm, the water norm should be 10-15% extra water norm (evaporated, filtered, etc.). You have to work later so that irrigation can be transformed into the productive moisture of the soil by giving the required amount of irrigation water to the irrigation areas in the form and manner that the plant can use. However, the structure of the soil does not break, the water use ratio is high, and most importantly, the productive soil layer is not eroded.

Thus, in areas where irrigation water is very large, the surface water velocity is higher than the soil rate and irrigation water forms a certain layer of water. On the contrary, in irrigation water areas, the velocity of the surface with the surface is equal to the rate of hopping, and the water given for irrigation is gradually ground to the soil. As a result, the process does not occur. Therefore, no conditions should be created for the destructive operation of the water supply and lime flow. In this process, the mechanical composition of the soil, its water permeability, the speed of water transfer, the inclination of the area, etc.

We need to consider the impact of various water consumption on the development of irrigation erosion in fields such as cotton, tobacco, wheat, maize, perennial grass (first year-clover) and perennial planting (apple orchard and olive) growing in irrigated agriculture of our republic.

For this purpose, there was no normalization in cotton cultivation areas - an unstable flow of 1,0 and 0,8 l / s, in tobacco cultivation areas - 0,1; 0.2; 0.3; 0.4; 0.6 and 0.8; autumn flow in autumn wheat crops, 0.4 and 0.8; direct flow in corn plantings 0.4 and 0.8 l / s, perennial flow in perennial grass (first clover), 0.4 and 0.8 l / s, perennial flow in perennial plantings (apple and olive), 2.0 l / s, 1.0 l / s and 0.5 l / s water. Research has shown that the effluent is dependent on the water consumption applied to natural conditions (mechanical composition of soils, irrigation method, length of lids etc) the amount of soil that has been washed is changed accordingly.

Thus, only 3% of the impact of irrigation water used by cotton seeds on the impact of irrigation water, only 26.8 t / ha of soil washed, the amount of soil washed up to 1.0 l / s by 19.4 t / ha, and 5.2 t / ha of land irrigation erosion due to the 0.8 l / s water consumption. Such regularity is also characteristic for other crop cultivation areas. It should be noted that erosion resistance plays a major role in directly eroding soil erosion. Thus, the alluvial-meadow grass used in tobacco cultivation is selected by the fact that cotton seeds are more erosion-resistant compared to the gray soils used. Therefore, the irrigation erosion process is so intense in such lands. In addition to the above, irrigation erosion is affected by the irrigation water used for irrigation of agricultural crops, as well as humus and essential for the growth and development of plants with fluid flow, nutrients (nitrogen, phosphorus and potassium) have to be washed away. The analysis shows that cotton was uncharged irrigation, with the amount of humus that was washed with fluid flow of 0.006%, the amount of humus that was washed with a flow of fluid was 0.79% % and 2.0% respectively, and 0.03% and 2.0% respectively in the field of wheat cultivation, 0.03% in corn cultivation and 2.02% in perennial crops and 0.011% in 1.22%. The growth was considerably greater than that of humus and other food ingredients that were properly regulated in plant crops or in areas with reduced water consumption. The amount of K2O in such cultivars is 144.6-241.0, respectively; 89.2-241.0; 70.5-86.10 and 144.5-181.3 mg / kg. All this negatively affects the growth and development of plants. Thus, in the area not covered by erosion of irrigation 18.22 wool on the body of a cotton plant, only 10-12 walnuts in cotton wool erosion area. The tobacco plant has a height of 234 cm and its technically useful cylinders is 54, but the height of the tobacco plant is 75 cm and the number of technically injured wounds has not been more than 17. In the area of 0.4 l per second, the size of the corn ("Krasnodar-508") is 275 cm long, the number of lids on its body is 3, the number of fodder in the autumn wheat (Bozozstaya-I) is 470, the weight of the horn is 1.9 grams amount of 51; The height of the corn is 217 cm, the number of lids I, wheat in the areas where water is very erratic and given irrigation erosion, while the figure of 1,000 is 45,8 grams, the jacket ("Azerbaijan 262") is 56 cm and the number of horses in one square meter is 473 The number of productive hulls is 350, the deepest amount in a spike is 28, the length of a spike is 4.9 cm, b 0.8 grams of powdered blackberry, 1000 gallons 34 grams, 35cm hemp height, no more than 416 horsepower in one square meter. All of these cause the productivity of the plants described.

Thus, 30.6 quintals per hectare of crops not eroded, 35.5 tons of tobacco, 53.0 kg of maize sown, 37.0 tons per year, and 372.0 per cent of annual grasses (alfalfa, green mass) If peanuts are harvested from perennial crops, 17 per cent of those eroded crops are respectively harvested; 16.9; 31.5; 23.3; 141.0; 49,2 s product was purchased.

Thus, users are affected by irrigation erosion every year from 12.4% of the cotton planting area; 18.6% of tobacco production; corn seeds - 11.5; wheat seeds - 13.7; 131 liters of cucumbers (first year) and 20.8 tons of perennial crops (palmetzes) are harvested. Given the above, water consumption should be followed when cotton, tobacco, corn, autumn wheat, clover, perennial crops are sprinkled and striped.

This measure should be coordinated with the area of the site, the length of the strip, the water capacity of the land, and so on. It would be best to note that water sprouting in cotton crop areas should not exceed 0.8%, tobacco, corn seeds - no more than 0.6-0.8 l / s, water consumption per ounce wheat and perennial grass (lumber) 1.0 and 1 , Should not exceed 5l / s, and the width of the irrigation strips should be 3-5 percent. The length of the irrigation canals in the cultivation areas of cultivated plants (tobacco, corn, perennial plantings) should be coordinated according to the area's spread. So, as the mail increases, the length and water consumption should be reduced. In addition, the diameter of hanging water used for irrigation water is also a key issue. Water particles with diameter greater than 0.10 mm (especially diameter of 0.15 mm), which are useless for irrigation, but particles with diameter from 0.10 mm to 0.005 mm are considered useful. Although such particles are suitable for improving the physical properties of the soil, even in such particles, the nutrients are small. In contrast to the particles mentioned, small particles with a diameter of 0.005 mm (especially 0.001 mm) are rich in nutrients, but their area is rapidly falling

apart. In addition, the use of water with such particles can lead to water leakage and aerating capacity. Therefore it is advisable to use mineral and organic fertilizer in areas with 0.10-0.005 mm diameter particle size. Application of technical means Azerbaijan's natural conditions and potential opportunities allow us to develop irrigation agriculture with every means. Therefore, it is possible to get more and higher crops than irrigated areas by using such facilities. It should be noted that 60% of the area consists of mountainous areas, even though it does not have natural conditions in our area. Technical equipment has a considerable role in expanding irrigation in areas where irrigation can be applied in areas that are relatively mountainous and in relatively mountainous areas. In the former Soviet Union, including a number of technical means for mechanizing irrigation in our country (aggregates of artificial rainfall, sprinkler systems, metering devices, pipes made of different materials, siphons, etc.). This equipment and equipment will give me the opportunity to apply irrigation methods (artificial rainfall, irrigation with impulse drops, small irrigation water, groundwater irrigation, etc.). Thus, "Freqate", "Kuban", "KSID-50", "Voljanka", "DDA-100 M", "DDA-MA", "Siqma-50", "DDN-70" "KSID-10", "KSID-10A" and others designed for irrigation of large and small areas. Due to the fact that the soil moisture content is provided in equal proportions as a result of the application of such machines and aggregates, the growth and development of plants are in the same equation.

Despite all this, in our republic such tools are not widely used. It is best that every landlord use a wide range of techniques (mainly farmers) in the land plot to which it is landed the use of artificial rainfall. Natural rainfall is a method of irrigation and is a reliable measure for high and stable harvest. As a result of applying this method, it is often possible to rinse with little water norm.

In addition, it is possible to carry out such irrigation in areas with complex relief without performing smoothing. Areas are arcs, canals and corals. Taking into consideration these advantages of the method, it is now used in artificial rainfall in many countries of the world. It should be noted that artificial rainfall researches were carried out in different soil and climatic zones of the former USSR. In these studies, artificial rainfall is beneficial. For example, in studies conducted in Uzbekistan, e it was found that the irrigation water and irrigation norms were 2 times less (520m3 / ha versus 1100m3 / ha). For five years, the average productivity of the cotton was 26.5 ha / ha, while artificial rainfall was 29.5 ha / ha or 10%.

It was found that, in contrast to the irrigation area, the cotton yield was 2.44 ha / ha higher in the field of artificial rainfall. The impact of artificial rainfall on the development of irrigation erosion in cotton and tobacco cultivation areas was investigated. It has been revealed that the flow of the artificial rainfall, the fluid flow, the flow coefficient, the flow of flow, the washing of foodstuffs are significantly reduced compared to the irrigation method. Despite the superior features of rainfall, it has not been widely used in the republic. Taking this into consideration, this method should be widely used in irrigated lands of the republic. The artificial rainfall system is divided into three groups, moving, semi-stationary and stationary.

The intensity of precipitation in machines and mechanisms is different. For example, "KI-50", "Raduga" machine is 0.23 mm / min. DDA-100 M 0,17 mm / min, DDN-70-0, 40mm / min, DYP-64 "Voljanka" -0,27 mm / min, DM "Freqate" -0,28 mm / min, DF "Dnepr "It has a rainfall of 0.28 mm / min. In order to avoid soil erosion, these indicators should be selected based on the mechanical composition of the soil, and the artificial rainfall should be selected. So heavy rains with mechanical content can range from 0.1 to 0.2 mm / min, with rainfall at 0.5-0.8 mm / min for moderate mechanical soil. In addition, the soil water-solubility capability should be determined.

The high intensity of precipitation and the larger the diameter of the rain drops lead to the destruction of the soil structure, the hardening of the topsoil, the formation of surface water and the flow of stream. Therefore, artificial rainfall should be combined with agro technical measures[1-6] (deep lubrication, splitting, storage of buffer strips, etc.).

Watering with mushrooms is one of the moderate irrigation methods. In this way, the water and nutrients in the watering can be given to the root systems by the amount of water necessary for the plants through the droplets, with the help of a special device (the nutrients are in the form of the crop). This method prevents the aquatic plants from sprinkling and evaporation, save 50-90%.

The roots of the plant do not spend extra energy to "seek" water and[7] food, and ultimately produce high quality, high quality products per hectare. Watering is widely used in various developed countries of the world (Israel, USA, etc.). Drip irrigation is economical. In the 1978 survey conducted in Bulgaria it was found out that the productivity of "Krasniotlichny" apple cultivated in the area of irrigation is still 310.9 sen / ha, while in the irrigated area it is 398.6 / ha, the productivity of the "Zolotoyotliiceni" varieties was 282 and 310 nd / ha respectively. In Pols a lot of work is being done to irrigate vegetable plants with drops. In the post-Soviet era, the technology of irrigation with drops was developed, and the advice of the All-Union Meeting of 1977 on this issue was consulted. This decision has shown that irrigation can be applied to the droplets irrigation methods and can be applied in any relief environment. It is possible to significantly increase the productivity of agricultural crops by reducing water consumption and hand labor. It should be noted that for the first time in Azerbaijan irrigation with drops, grapes and fruit gardens have been applied. HM Huseynov and others have shown that when using this method of irrigation, the yield of fruits is 20-50%, the yield of vegetables is 50-100%, the yield of grapes is 30-40%, etc. increases. In addition, other moderate irrigation techniques (artificial rainfall) are estimated at approximately 60% of their relative water. Suvarmaya less labor and workforce are spent. Thus, in the irrigation method, a total of 2.5 man-hours were spent on irrigation with drops in the case of 37 people for watering a hectare of crops per year. In addition, the equipment used for drip irrigation should also be installed elsewhere.

This method does not require smoothness of the area most notably, the formation of fluid and flow stream. Our researches have shown that in the case of ordinary irrigation, only one liter of water contains 13.4-13.6 g / l of suspended particles, but the soil was not washed out with the drop irrigation. As a result, the efficiency of the sowing with drops compared to ordinary irrigation increased by 35.7-38.5%. Therefore, this method provides more space for watering it is. This method can be easily applied within the farm. For this purpose, the subartecia should be dispensed from the artesian wells and from the water

sources to the water pipes, and then to the damped fasteners in the humidifier hoses. Due to the application of the process, manual labor is considerably reduced and the soil can be washed off watering with synchronous rainfall. The favorable natural conditions of the Republic of Azerbaijan allow people living there to pay for foodstuffs in every way. As mentioned above, more than 85-90% of agricultural products are taken from irrigated areas. Such areas are mainly located in flat areas.

Surface irrigation is mainly applied in such areas[8-11]. In this way, the ground surface and its profile do not moisten equally and water loss is avoided. Thus irrigation erosion develops in irrigated areas. It is not possible to apply surface irrigation methods (gray or striped) in areas with natural conditions of complex relief. It is possible to easily solve irrigation issues in the field, with the use of simultaneous pulsed rainfall in areas with a high degree of complexity and in relief structures. Suvarman's technical tools include pulsating rain pulsing, pulsed dipsters and small dispersing rainfall, etc. It is important to note that rainfall (synchronous mode) is selected as the year of environmental protection from other irrigation methods. Synchronous rainfall impulsive precipitation this erosion process is completely eradicated in relief conditions. Such irrigation is carried out by a "KSID-10" impulse-bearing apparatus. It is possible to irrigate fields with 10 hectares, and sometimes even more areas. Its core business principle continues to work without interruption. The signal transmitted to the water distributor regulates the operation of the pump station. The water enters the pumping station from the pump station to the impulse rains. His next activity automatically replicates and regulates rainfall. In this case water is characterized by its duration and intensity. It is also distinguished by 3 types of irrigation. The first one is synchronous, the second is synchronized, and the third is asynchronous. Water supply in absolute synchronous irrigation is done by irrigation and daily water intensity, as well as synchronous irrigation with the same tone water per day.

Asynchronous, however, is that the water regime improves and the washing is eliminated.

The soil-protective role of yoghas when using the soil in the same area for a long time, the quantity of food (organic and mineral) substances in them decreases and the water-physical properties deteriorate. This is then apparent to the productivity of agricultural crops. Therefore, technological, meliorative and organizational measures are carried out in accordance with the natural-economic, soil-climatic conditions of the area in order to increase soil fertility and effectively use it. All this is the basis of the agricultural system. Perennial herbs, especially clover, are considered to be the best predecessors of all agricultural crops due to the soil properties and the productivity of the main plant. As it is known, strong and branched shaft roots are. These roots go 0.5-1.0 m, sometimes to the depth of the soil, and tighten the soil aggregates, such as "spider-grass." In addition, the fibrous bacteria produced in the root system absorb nitrogen in the air and enrich the soil with nitrogen. Yonca's soil-protective role is even greater. Literature notes that for two years, the root system of the chickens collects up to 0 to 40 centimeters of organic matter, depending on the soil wash degree. It increases soil fertility and prevents irrigation erosion. As is well known, the main indication of soil is water, air, biological and food regime dependent on soil structure.

Depending on the structure of the Azerbaijani lands, the quartz (aggregate size greater than 10 mm), granular-topavari or macrostructure (size of aggregates from 1 mm up to 1 mm) is equivalent to a meza structure (size of aggregates from 0.25 to 1 mm microstructure (size of aggregates from 0 to 01 mm to 0.25 mm) and ultrastructure (from 0.001 to 0.01 mm in size of the aggregates).

Of these, agronomical, the most useful are only aggregates with small top and marine structures. Their diameter is 0, 25-1, 0 mm. Such structured aggregates keep their properties (dispersion, water-resistance, etc.) when used for long-term planting. It has been established that the improvement of the structure increases productivity.

Thus, in the lands with a water-resistant aggregate of 0.25 mm in 14%, the yield of cereal crops is 22.2 c / ha in the 8% of the sustainable aggregates, it dropped to 18.4 c / ha (3.8 c / ha). It should be noted that alfalfa plays a major role in improving the water-physical properties of the soil as well as the agrochemical composition shows that the amount of water-resistant aggregates under the clover is much higher than the cotton fields that are cultivated. This can be clearly seen from the following comparison.

Thus, the amount of water-resistant aggregates at 0-10sm of soil in the cotton field is 4,0-18,5; At 0-20cm, this figure was increased by 35.0, 24.7 and 27.0, respectively, in the 6.5-11.2 and 20-30 cm at the level of 4.5-18.2.

However, much organic mineral substance collection was found under the clover planting. It has been proven by analyzes of soil samples collected from one year and two years. It has been revealed that, in the field of planting a year, 1.66% humus, 0.112% of total nitrogen is collected in the topsoil, while the amount of humus collected in the topsoil of the two-year clover area is 1.70%, and the total nitrogen content is 0.150% that the development of irrigation erosion in irrigated planting areas is largely dependent on the large cover of the terrain surface.

The observations have made it clear. It has been known that clover soil is relatively weak (0.4 mm / min) or even more (1.4mm / min) when it rains. So 0.4 mm / min. In the intensive rainfall, the depth of the grass formed under the clover is 14.4 mm, at 31 mm for 1.4 mm / min, respectively, in the range of cotton seeds it is 50.9 and 64.2 mm respectively, and 78.6 and 113 respectively, It is desirable to use 3: 7, 3: 7, 3: 7 planted seedlings for 3: 6, moderately degraded soils for combating irrigation erosion in cotton clover turnover system taking into account all of the above.

In the first scheme, cotton seedlings will occupy 70.6% of total crops, 66.6% in medium-sized soils, 57.0% in medium-washable areas, 50.0% in heavy washrooms and 70% in medium-washable landscapes. Studies show that soil erosion and severe erosion the fertility collected is 2-3 years, 3-4 in the moderately eroded soils, 5-6 in heavily soaked soils and 6-7 in medium-washable soils.

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