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LAND RESOURCES MANAGEMENT ISSUES
IN THE REPUBLIC OF ARMENIA

P. G. DAVTYAN §, T. P. DAVTYAN ^{1*}, A. H. VARDANYAN ^{2**}, A. S. HAKOBYAN ^{3***}

¹ *Chair of Service, YSU, Armenia*

² *Chair of Cartography and Geomorphology, YSU, Armenia*

³ *Mkhchyan Secondary School of Ararat Marz of the Republic of Armenia*

Soil degradation is a multifactorial process, so the data obtained as a result of their study are important in organization of land management.

The paper studies and analyzes the forms, causes and consequences of soil degradation caused by land use. These analyses made it possible to identify existing shortcomings and issues land management. Valuable conclusions and recommendations have been made aimed at improving the efficiency in organization of land management, which, to a greater or lesser extent, will help mitigate soil degradation, which is very actual and urgent for our land-poor Republic.

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Introduction. Agriculture is one of the significant spheres of the economy. It meets human nutritional requirements and in some cases provides raw materials for food and light industries. Land is considered as the working object for agriculture, hence agriculture is considered to be one of the main land using spheres of economy. Agriculture is the kind of land usage in which the relationship between human and nature with its negative and positive sides is obviously visible [1].

Taking into account the fact that agriculture is considered the main land user, we can indicate that the share of this sphere of economy is particularly high in anthropogenic land degradation. Studying the forms of degradation due to land usage gives us an opportunity to identify the existing problems of land resource management.

The land fund of RA is 2974 thousand hectares and only 48% of that is considered as agricultural lands. Also taking into account that only 41% of agricultural lands is considered to be actively cultivated land, 37% is arable land, 4% is perennial plantations, it is obvious that RA is a country with scarce arable land.

§ Deceased

* E-mail: tdavtyan@ysu.am

** E-mail: armine.vardanyan@ysu.am

*** E-mail: annahakobyan5555@mail.ru

It is enough to note that it sums up to only 0.13 *ha* of arable land per person. In this case, the loss of even a small amount of land annually through land usage may cause irreversible consequences. Therefore, proper land management in RA is highly relevant and crucial.

Problem Setting. Taking into account the aforementioned issues, the paper is aimed to studying the forms of degradation caused by land use, the cause-and-effect relationships of their occurrence, and identifying the gaps and problems of land resource management. This will give an opportunity to develop relevant measures to minimize land degradation in the Republic. Only based on thorough research one can reach valuable conclusions and make clear recommendations, which is considered the main goal of the work.

Results and Discussion. Land degradation caused by agricultural activities appears in many forms. In one case, the degradation can be caused by the result of violation of the rules of tillage, the violation of the irrigation regime, the lack of application of crop rotation, the violation of the doses of pesticides and fertilizers used, and in the other case, by the unplanned grazing of pastures. However, along with all this, the main reason for land degradation is leaving them uncultivated. Nowadays more than 50% of the arable lands in the republic are not cultivated. It should be indicated that most of them are allocated in the Ararat Valley, where the cultivated irrigated lands dominate. Leaving them uncultivated can result in their transformation into a natural state, which means to turn into waste lands that are almost devoid of humus and structure. Non-cultivation is caused by several factors, the first and most important of which is the presence of small farms, lack of irrigation water, and high costs. Under these conditions, the farmers work without income and avoid unnecessary expenses. Taking into account the mentioned conditions, we suggest unification of land plots, enlargement and formation of capable farms. In this case the efficiency of agriculture will increase. The government of RA makes attempts to take this measure and plans to organize this process from 2023 to 2026.

It is necessary to develop a plan of organizing the enlargement properly, otherwise the situation will turn out to repeat what happened after the privatization of land, when the land was privatized and the enterprises processing agricultural raw materials remained the property of the state. In that case, there was no interest and the farmers could not deliver their harvest to the entrepreneurs for weeks. As a result, the quality characteristics of the harvest decreased. On the other hand, as a result of the monetary policy, the farmers received a small amount of money for the delivered crop. Taking into account the aforementioned factors, it is necessary to conduct a relevant policy to avoid such situations, and to increase the interest among the rural population to enlarge their plots of land.

At the first view, the application of crop rotation as an agro-technical measure seems trivial, but actually it is violation has a rather serious effect. As a result of violation of the rules of crop rotation, the humus-bearing layer of the soil decreases and the soil loses its yield over the years. Another form of degradation to this is the differentiation of cultivated plants in the soil, as a result of which both the yield and the diseases that may develop in the soil decrease. The role of this factor has increased especially following the land privatization. There was an exemplary approach to land use in the Soviet years, according to which the choice of the crop

that had to be raised in the upcoming year was being done. This was done to preserve the quality characteristics of the soil.

After privatization, these rules are not practiced. The reason for this is to avoid costs, especially the price of irrigation water. Basically, the crops requiring less water are processed: in another case land degradation is associated with the use of poor quality seeds, which are imported without governmental control and expertise, introducing many diseases as well [2].

Respectively, it becomes clear that the relevant authorities should be involved in this matter, along with the organized agricultural enterprises; they should take control of the crop rotation and the processes of seeds import through monitoring. Another form of degradation is the violation of tillage rules, the effect of which is dual. In one case, the cause of degradation can be the longitudinal tillage of soils on steep slopes, and the deep tillage of soils in the other case. In the first case, the violation of tillage rules leads to intensive soil washing and erosion.

It is well known that tillage starts to remove a huge amount of soil moisture through evaporation, which slows down or even interrupts the humus process. Meanwhile, tillage loosens the topsoil, dries it out and makes the soil more susceptible to degradation. In the territory of RA, the method of loosening instead of plowing has been used for a long time, in this case only 8–10 *cm* layer of soil is disturbed, and this is enough to cover the seed. In this case, the moisture of the lower layer of the soil (20–40 *cm*) is preserved and humusification processes continue, atmospheric precipitation is easily absorbed, and the best hydrophysical properties are preserved, soil erosion is weakened as well. In this case, the possibilities of accumulation of CO₂ gas also increases [3].

One of the most important causes of land degradation is the violation of the irrigation regime. For irrigation it is necessary to have a perfect network, which is still incomplete in RA. During the irrigation season, huge water flow losses are observed, in most cases reaching up to 40–50%. In case of violation of the irrigation regime either secondary salinization or soil overwetting occurs. Overwetting through irrigation has increased especially during the phase of land privatization. Thus, during the Soviet years, when collective farms were operating, cultivated plots were large and were under the cultivation of a single type culture. It was irrigated once and was awaiting for the next irrigation.

As a result of privatization, large plots of land are divided among several, sometimes dozens of owners. Each one grows different crops, which have different water requirements, and it turns out that during the whole vegetation season the soil is constantly irrigated. As a result, the groundwater level rises and either super-humid or saline areas are emerged.

From the aforementioned it becomes clear that a serious work should be done in this direction. First of all, it is necessary to restore the irrigation network, and secondly to switch to smart farming; that is drip irrigation, which is possible only if plots are increased. Irrigation requires strict regulation and will become more severe in the future due to global warming. All landscape zones in the Republic of Armenia are migrating upwards, as a result of which the semi-desert zone expands at the expense of the snow zone, which is the main water supplier of the Republic [3]. Violation of the qualitative and quantitative indicators of the doses of fertilizers and

pesticides used in plant cultivation is also a serious problem in the territory of the Republic. The balance of the natural biochemical cycle of chemical elements is disturbed, that is why the farmers add additional means to fertilize the soil. Unfortunately, these soils have not been chemically analyzed for a long time to understand the state of removed and accumulated elements. In both cases, the balance of the elements is disturbed. It turns out that the farmers use fertilizers based not on the soil and crop requirements for them, but on the type of fertilizers which are available. The issue of pesticide use is serious as well. These are the pollutants of the soil and water bodies that one uses consciously [4]. The volume and types of pesticides are used are increasing year by year. This is connected to the process of import, when low-cost and overdue pesticides are imported, providing the importer with huge profits. Imported pesticides also include a large number of already banned drugs and pesticides that contain chlorine, which creates accumulation in the soil and food chain, contaminating both the environment and the crops. Thus, it is obvious that serious control should be established in these directions as well. If in the case of fertilizers the state should support the farmer to import various types of materials, then in the case of importing pesticides it is necessary to create experimental groups to control the quality, terms and harmfulness of the imported materials. One form of agricultural land degradation that also requires management is overgrazing. As a result of overgrazing, there is a change in vegetation composition, more valuable forage plants are replaced by weedy, thorny, poisonous species. The trampling of the soil by animals leads to the creation of plantless areas, which are desertified and contribute to soil erosion [1]. The problem is the fact that when the collective farms were still in control and the farms operated, the communities decided the grazing area and carried out the transportation of the animals. Due to the lack of fodder in the post-privatization phase, animals were taken out in the early spring of the pasture, when the plants had not yet established and had not completed vegetation.

As a result, they were trampled or torn by animals, creating vegetation-free areas. The same thing happened when the animals came down from the pasture in early autumn. In these lands, the measures should be taken by the state to organize the irrigation of pastures and to establish reasonable periods of grazing. Supporting the farmer to organize the future grazing season, providing vehicles and adjusting the roads should be carried out.

Conclusion. Studying the forms of degradation and the necessary measures and recommendations should be implemented. It should be mentioned that the problems are related to human activities, which actually makes land management easier.

It can be done by organizing special courses for those engaged in agricultural work. It is necessary to develop the idea of humanism in people, to make them understand that the incomes received today are not eternal and if the agricultural lands are reduced, the incomes will also be reduced.

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Պ. Գ. ԴԱՎԹՅԱՆ, Տ. Պ. ԴԱՎԹՅԱՆ, Ա. Հ. ՎԱՐԴԱՆՅԱՆ, Ա. Ս. ՀԱԿՈԲՅԱՆ

ՀՈՂԱՅԻՆ ՌԵՍՈՒՐՍՆԵՐԻ ԿԱՌԱՎԱՐՄԱՆ ՀԻՄՆԱԽՆԴԻՐՆԵՐԸ
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Ա մ փ ո փ ու մ

Հողերի դեգրադացիան բազմագործոն գործընթաց է, հետևաբար դրանց ուսումնասիրման արդյունք ստացված տվյալները կաևոր նշանակություն ունեն հողային ռեսուրսների կառավարման կազմակերպման գործում:

Աշխատանքում ուսումնասիրվել և վերլուծվել են հողօգտագործման հետևանքով առաջացած դեգրադացիայի դրսևորման ձևերը, պատճառներն ու հետևանքները: Դրանք հնարավորություն են տվել բացահայտելու հողային ռեսուրսների կառավարման գործում գոյություն ունեցող թերություններն ու խնդիրները: Կատարվել են արժեքավոր եզրակացություններ ու առաջարկություններ՝ ուղղված հողային ռեսուրսների կառավարման կազմակերպման և դրա արդյունավետության բարձրացման գործին, որոնք քիչ թե շատ կնպաստեն հողերի դեգրադացիայի մեղմմանը, որը խիստ արդիական և հրատապ է սակավահող մեր հանրապետության համար:

П. Г. ДАВТЯН, Т. П. ДАВТЯН, А. А. ВАРДАНЯН, А. С. АКОБЯН

ПРОБЛЕМЫ УПРАВЛЕНИЯ ЗЕМЕЛЬНЫМИ РЕСУРСАМИ
В РЕСПУБЛИКЕ АРМЕНИЯ

Резюме

Деградация почв является многофакторным процессом, поэтому данные, полученные в результате ее изучения, имеют важное значение при организации управления земельными ресурсами.

В работе изучены и проанализированы формы, причины и последствия деградации почв, вызванной землепользованием, что позволило выявить существующие недостатки и проблемы в управлении земельными ресурсами. Сделаны ценные выводы и рекомендации, направленные на повышение эффективности управления земельными ресурсами, которые в большей или меньшей степени будут способствовать смягчению деградации почв, что весьма актуально и неотложно для нашей малоземельной республики.