

Improving the methods of determining the amount of non-agricultural land use in agriculturæ in Uzbekistan

Uzbekkhon Mukhtorov^{1*}, *Bakhodir Sultanov*¹, *Marina Li*¹, *Khusnobod Khushvaktova*², *Soista Saidova*² and *Zainab Valieva*²

¹“Tashkent Institute of Irrigation and Agricultural Mechanization Engineers” National Research University, Kory Niyoziy str., 39, 100000, Tashkent, Uzbekistan

²Uzbekistan State World Language University. Tashkent, Uzbekistan

Abstract. Today in Uzbekistan, fines are imposed for sanctioning violations of agricultural lands, which are used irrationally in protecting agricultural lands and preventing them from escaping from agricultural turnover. The calculation of these fines is included in the category of administrative offenses and is punishable by fines. This is a very recurring violation of the use of agricultural land for purposes other than those intended for illegal use. The imposition of fines is not sufficient to determine the amount of the basic calculation in Uzbekistan, and it is not effective enough to protect them. In order to increase the effectiveness of sanctions, it is advisable to impose fines for the illegal use of agricultural land in the protection of agricultural lands, taking into account the size of the land, the soil fertility, and the yield that can be obtained from it. Because it significantly increases the amount of fines and allows you to direct these fines for the efficient use of these lands. Therefore, this article offers suggestions for improving the method of calculating the amount of fines for improper use of agricultural land, taking into account the size of the land, soil fertility, and productivity.

1 Introduction

Today, global climate changes taking place in the 21st century, which are considered the main means of meeting the demand of the population of agricultural lands for food and raw materials, the aggravation of the ecological crisis as a result of the decrease in Biological Diversity, the further urgency of the issue of ensuring food security of the country in the conditions of And the preservation of the current attitude to the land was considered by the mutukhassis as a consequence of the fact that “by the 2050 year the total area of crops per capita and fertile land accounted for only a quarter of the level of the 1960 year”[1-5]. One of the main measures aimed at protecting and increasing agricultural land productivity is to improve the mechanisms of economic incentives for its users. However, it should be noted that one of the main measures aimed at increasing the importance of irrigated lands in agriculture is to increase the effectiveness of measures against irrational use and any

* Corresponding author: u.muxtorov@tiame.uz

violations. Proceeding from the above, the cases of violations affecting their status in the use of existing agricultural lands in the Republic were analyzed and proposals were developed to regulate and improve the sanctioning processes aimed at protecting them in the non-use of irrigated lands [6, 7].

At the next stages of the land reforms carried out in our country today, the issues of further development of land use processes, expansion of the scope of scientific research on the improvement of the system of promotion of effective, rational, and targeted use of land by agricultural land users and at the same time increasing their responsibilities in land relations on an In practice, the observation of a large number of cases of violations of the law in the processes of land use by landowners dictates that the process of organizing the effective use of agricultural land, directly changing the attitude [8-12].

It is expedient to impose economic sanctions on land users for irrational use of land, to compensate for the damage caused as a result of misuse of their amount, and to compensate for losses [13-16]. The specific characteristics of soils should be taken into account in the development of norms that reflect the economic regulation of rational land use. In this case, the fertility of the soil and the efficiency of cultivation should be taken into account. Reducing the number of key criteria used in the application of fines reduces the cost of setting them, but it is advisable to find an acceptable limit on the number of indicators. In our opinion, the fines levied on the irrational and illegal use of agricultural land should be directed not to the full budget, but to the maintenance and restoration of soil fertility [17, 18].

Analysis showed that as a result of the inspections carried out from 2016 to 2019, 373 heads of economic entities identified cases of violation of land law on 94.4 thousand hectares of land. Administrative measures were taken in accordance with the “Code of administrative responsibility” of the Republic of Uzbekistan in relation to 326 subjects who committed cases of violation of the law (Table 1).

Table 1. Cases of violation of land law, determined in different years by the Republic.

Years of inspections	Number of violations	The area where violations of the land law are detected (thousand ha)	The area where land violations were detected (thousand ha)
2016	373	94,4	326
2017	342	66,0	289
2018	285	4,7	237
2019	541	2,1	458
Total	5973	167,2	2948

And in 2019, there were 541 violations of the law in the economic sector, an increase of 45 percent compared to the 2016 year can be seen. However, the area in which violations of land law were detected for these years decreased from 94,4 thousand hectares to 2,1 hectares [19-21].

In the analysis of the above-mentioned violations, 27.8% of cases of concealment or misrepresentation of data by 104 land users, 36.2% of withdrawals by 135 land users from internal land management projects, 92 cases of landlessness by 92 land users or cases of inefficient use accounted for 24.7 percent, and other violations by 42 land users accounted for 11.3 percent (Table 2).

In 2019, 541 economic entities identified cases of land irregularities on an area of 2.1 thousand hectares, and 458 land-user entities identified appropriate measures. Here 71 cases of anonymity or misrepresentation of information from the report by users of land 23 percent, 184 cases of withdrawal from the projects of Economic Internal land formation by users of land 56 percent, 135 cases of non-economic or inefficient use of land by users of land 14 percent, 151 cases of violation of the law by users of land [22-25].

Table 2. Cases of land violations were revealed as a result of scheduled inspections conducted by the Committee "Davergeodezkadastr" in different years.

Years	Types of ground law violations					
	Land as a landowner or inefficient use	Use of lands for purposes other than those intended	Failure to comply with soil conditions and land improvement	Hiding or misrepresenting information from the report	Design, construction, and operation of objects, deviating from the domestic land-building projects of the farm	Other land law violations
In% of the total						
2016	Total 374					
	25	-	-	28	35	12
2017	Total 342					
	26	6	1	19	45	3
2018	Total 285					
	20	10	-	12	56	2
2019	Total 541					
	14	-	-	23	56	7

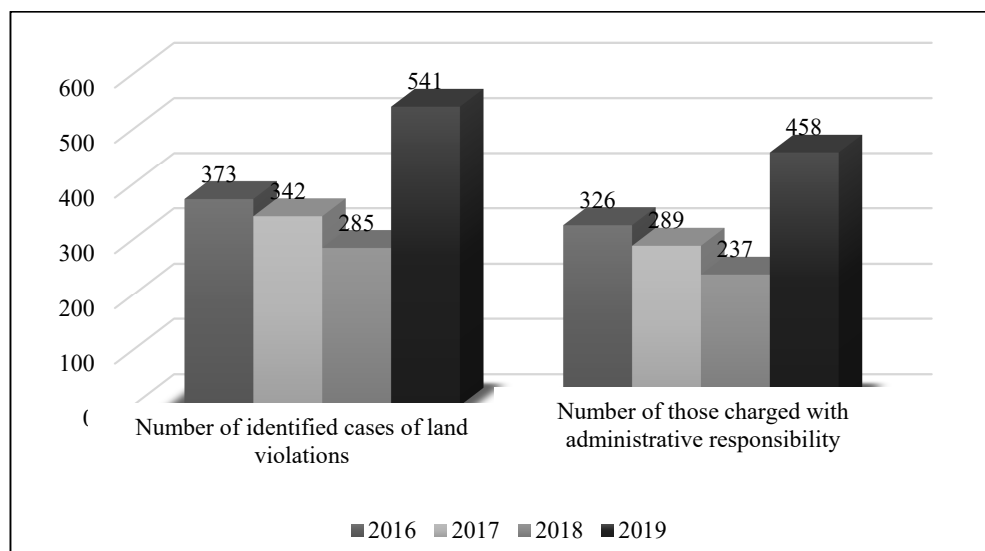


Fig 1. Identified land violations and the dynamics of measures taken.

According to the analysis carried out, in the use of agricultural land in land violations, it is possible to observe the use of it for other purposes than its intended purpose, including the placement of crops other than the specified type of crop, as well as the cases of deviations from the terms of the contract. In this case, the total amount of 101.6 million UZS in cases of violation of the land law determined by the Republic in 2016. 711.6 million UZS in 2017. In 2018, administrative fines of 429.4 million UZS and in 2019 645.8 million UZS were imposed [26-28].

2 Materials and methods

In the Republic, there will be an opportunity to increase the efficiency of measures to increase the productivity of lands by spending the fines levied in improving the condition of agricultural lands and increasing their productivity by directing them to these activities.

The organization of effective use of land resources, especially irrigated agricultural land among natural resources, requires the establishment of effective measures to protect and protect it in the regulation of land relations. The use of non-agricultural land, and non-compliance with the established rules and norms, require the withdrawal of land intended for agriculture from its composition and, as a result, the implementation of cost and technical measures to restore its fertility. In order to preserve the existing lands in agriculture, Bunda has identified anthropogenic factors and the effective organization of measures aimed at preventing the irregularities that lead to it as the main factor in achieving the set goal.

A special emphasis was placed on the measures of its influence in the study of the type and condition of the Republic's responsibilities in relation to land violations. Based on the powers of the state bodies on the definition of the type of violations related to land and the responsibility established with respect to it, proposals were developed to improve the method of calculating the amount of fines established when the irrigated agricultural land was used for its intended purpose in order to increase the effectiveness of the irregularities in agricultural

According to Article 65 of the “Code of administrative responsibility of the Republic of Uzbekistan” “the use of lands by landlords, the failure to obtain a fertile layer during the construction of objects, the use of land for other purposes, the commission of other actions that lead to the exclusion of the use of land, the decline in productivity, the degradation or destruction of soil, — three to five times the amount of fines will cause” [6] is defined as.

Based on the above-established norm and according to the amount of the base calculation currently in force (223 thousand UZS), if the state of land violations occurs by citizens, a fine of 223 thousand UZS to 669 thousand UZS is established. If this situation is committed by an official, a fine of 669 thousand to 1 115 000 UZS will be imposed.

Taking into account the above-mentioned circumstances, it is necessary to impose further penalties on cases of irregularities in the field of land use. When using land without purpose or for other purposes, it is desirable to determine the amount of fine taking into account the fertility of the soil and its normative value. Because the amount of the fine should serve to increase the responsibility for the land in the respondent when the liability is established.

When agricultural land is used for other purposes, our legislation also establishes criminal liability based on the significance of the administrative and offense. In our opinion, such an approach is not sufficient in the application of punitive measures. The reason is that it is expedient to formulate the amount of fines for misuse of land or for other purposes on the basis of a clear calculation.

The total amount of fine applied to 15 farmers of the region in 2019 for the violation of the law determined by specialists of the land resources and state Cadastre Department of Kashkadarya region on the use of irrigated lands in agriculture for a different purpose than the specified purpose was 6 545 120 UZS (Table 3).

Table 3. The amount of fines determined when agricultural lands are used for other purposes in farmer farms studied in the Kashkadarya region (2019 year).

<i>Number of farmer farms in which other uses of agricultural land are determined</i>	15
---	----

Type of Use condition for another purpose	According to the first part of Article 65 of the code of administrative responsibility, the use of the district reserve land by landlords and a designated expatriate for another purpose
Total land area used for purposes other than agricultural land, ha	26,2
The total amount of fine applied, in UZS	6 545 120
The average amount of fine, in UZS	436 341

The average fine in each case was 436,341 UZS. The land area is 26.2 hectares. These lands were illegally planted with relatively lucrative crops such as alfalfa, vegetables, potatoes, and sunflowers, which were assessed in violation of the terms of the contract.

In this case, it is not advisable to calculate the amount of the fine in each case in relation to the base amount. In such cases, the size, quantity, or productivity of the land plot is not taken into account at all.

In calculating the fines imposed in the above cases, in a sense, the protection of agricultural lands and the reduction of their consequences are aimed, and the main priority is to prevent the misappropriation of agricultural lands for other purposes. However, existing procedures to prevent land-related violations are insufficient to reduce its causative factors. The reason is that any measure of responsibility is defined as the main task of preventing that violation of the law and serving to prevent its recurrence in the future. Our measures do not provide a satisfactory level of implementation of the above. This can be seen in the fact that land violations are on the rise today. In addition, the violation does not provide for the amount of one to five times the base amount, in which case it is set at one time, and in which cases at two, three, four, and five times. This does not necessarily mean that the exact calculation in determining the fine will come from the books.

Therefore, it is advisable to rely on accurate calculations in the calculation of the amount of damage and fines caused by the use of agricultural land for other purposes. In addition, the experience of foreign countries shows that in each case we can see the methods of calculating the penalty based on the amount of land on which it is committed and the value of the product from its designated type of crop, ie the normative value of agricultural land. Therefore, an approach through clear calculations and methods in determining fines is somewhat preferable. Therefore, we propose the following methodology for calculating the amount of fines for the use of agricultural land for other purposes.

In this case, the penalty for the use of agricultural land for other purposes should be made by calculating the profit that can be obtained from the same plot of land. We propose to calculate this using the following formula.

$$UOP_{af} = UOP_{lh} * AP_{ha} * Y_m \quad (1)$$

Where: UOP_{af} – the amount of the fine for use of the land plot for other purposes, in UZS;
 UOP_{lh} – land used for other purposes, per hectare;
 AP_{ha} – Amount of profit at current prices per 1 hectare, in UZS (calculated according to formula (2));
 Y_m – years of agricultural land used for other purposes.
 AP_{ha} in Formula 1 is the average annual income received from the use of land for its own purposes, which is calculated by the following formula;

$$AP_{ha} = N_p * B_b * A_{ap} \quad (2)$$

Where: N_p – normative yield of agricultural crops, ts/ha;
 B_b – bonitet ball;
 A_{ap} – the average annual price of the relevant type of agricultural products sold in farmers markets, thousand UZS/ts.

3 Results and discussion

According to the procedure for calculating the amount of fines for the use of irrigated agricultural lands for other purposes, the total amount of fines imposed on 26.2 hectares of 15 lands of Kashkadarya region in violation of the law amounted to 6545.1 thousand UZS. The average fine for each case was 436,341 UZS (Table 4).

Table 4. The amount of fines calculated when used for purposes other than agricultural land according to the proposed method.

Number of farms where the use of agricultural land for other purposes has been identified	15
Type of use for other purposes	According to the first part of Article 65 of the code of administrative responsibility, the use of the district reserve land by landlords and a designated expatriate for another purpose
Total land area used for purposes other than agricultural land, ha	26,2
The total average annual amount of profit at current prices ($AP_{ha} = N_p * B_b * A_{ap}$) thousand UZS	105845,675
The total amount of the fine, $UOP_{af} = UOP_{lh} * AP_{ha} * Y_m$ thousand UZS	99097,947
The average amount of the fine, thousand UZS	6606,529

According to the proposed methodology (through expression 1), ie the average annual income on the area of agricultural land, soil quality score, and the type of crop determined from it, when calculating the amount of fines for violations in the above 15 farms, the total amount of fines on 26.2 ha 99097, Amounted to 947 thousand UZS. At the same time, the average fine for each violation was calculated to be 6606,529 thousand UZS.

Comparative results of the amount of fines collected in accordance with the current procedure and the amount of fines calculated according to the proposed methodology for the use of agricultural land in the territory of districts of Kashkadarya region (Table 5). Captions should be typed in 9-point Times. They should be centred above the tables and flush left beneath the Figures.

Table 5. Comparative table for calculating the amount of fines for the use of agricultural land for other purposes.

Number of farmer farms identified by law violations	The total land area where the violations took place, ha	Amount of fine according to the current procedure, thousand UZS	The amount of the penalty calculated on the offer, $UOPaf = UOPlh * APha * Ym$, thousand UZS	thousand UZS
15	26,2	6545,1	99097,9	+ 92552,8

According to the comparative results of the table, the amount of fines calculated according to the current procedure amounted to 6541.1 thousand UZS, while according to the proposed methodology, this Figure is 99097.9 thousand soums. The difference between them increased by 92552.8 thousand UZS.

4 Conclusions

In conclusion, it can be said that the fines imposed for current land violations in the case under consideration are not based on a clear calculation. This is not effective in changing the attitude of land users towards land, especially agricultural land. In fact, the approach to determining the amount of the fine, based on its profitability and efficiency, provides fairness and is somewhat more just. In addition, the amount of fines calculated according to the proposed methodology will increase by 5.6 times compared to the current one. This, of course, will increase the amount of funds coming to the state budget, which will allow directing these funds to increase the efficiency of agricultural land use, improve land reclamation and finance agricultural development activities.

Place the Figure as close as possible after the point where it is first referenced in the text. If there is a large number of Figures and tables, it might be necessary to place some before their text citation.

References

1. M. García, M.T. Godinho, R. Espada, G. Avilés, I.S. Brito, M. Álvarez, A. Troncoso, R. Escudero, *Discovering Spatio-Temporal Patterns in Precision Agriculture Based on Triclustering*, Advances in Intelligent Systems and Computing, **1268**, AISC, 226-36 (2021)
2. A. Kavvadias, E. Psomiadis, M. Chanioti, E. Gala, S. Michas, *Precision agriculture - Comparison and evaluation of innovative very high resolution (UAV) and LandSat data*, CEUR Workshop Proc, **1498** (2015)
3. Y. Qin, Z. Jixian, *Methodology to develop land capability maps using geo-information systems (GIS)*, Geo-spatial Inf Sci, **5** (2002)
4. B.Basso, L. Liu, *Seasonal crop yield forecast: Methods, applications, and accuracies*, **154** (Elsevier Inc., 2019)
5. P.S. Thenkabail, *Water productivity mapping using remote sensing data of various resolutions to support "more crop per drop"*, **3** (2009)
6. J. Mladen, P. Ivan, J. Tomislav, *Methodology to develop land capability maps using geo-information systems (GIS)*, *African J. Agric Res*, **8** (2013)
7. O.A. Denton, V.O. Aduramigba-Modupe, A.O. Ojo, O.D. Adeoyolanu, K.S. Are, A.O. Adelana, A.O. Oyedele, A.O. Adetayo, A.O. Oke, *Assessment of spatial variability and mapping of soil properties for sustainable agricultural production using geographic information system techniques (GIS)*, *Cogent Food Agric.*, **3** (2017)
8. S. Mori, M. Kato, T. Ido, *GISELA - GIS-based evaluation of land use and agriculture market analysis under global warming*, *Appl. Energy*, **87** (2010)
9. N. Tantalaki, S. Souravlas, M. Roumeliotis, *Data-Driven Decision Making in Precision Agriculture: The Rise of Big Data in Agricultural Systems*, *J. Agric. Food Inf.*, **20** (2019)

10. M. Reimov, V. Statov, P. Reymov, N. Mamutov, S. Abdireymov, Y. Khudaybergenov, S. Matchanova, A. Orazbaev, *Evaluation of desertified delta plant communities using spectral indexes and landscape transformation models*, J. E3S Web Conf., **227** (2021)
11. M. Khamidov, K. Isabaev, U. Islamov, Z. Mamatkulov, *Application of geoinformation technologies for sustainable*, **7** (2020)
12. A. Inamov, S. Safayev, S. Mukhammadayubova, *Significance of drones in monitoring of agricultural lands of Uzbekistan*, J. E3S Web Conf., **258** (2021)
13. D. Bazarov, S. Umarov, R. Oymatov, F. Uljaev, K. Rayimov, I. Raimova, *Hydraulic parameters in the area of the main dam intake structure of the river*, J. E3S Web Conf., **264** (2021)
14. G. Shodmonova, U. Islomov, O. Abdisamatov, S. Khikmatullaev, U. Kholiyorov, S. Khamraeva, *Numerical solution of nonlinear integro-differential equations*, IOP Conf. Ser. Mater. Sci. Eng., **896** (2020)
15. Z. Mamatkulov, J. Rashidov, G. Eshchanova, M. Berdiev, Z. Abdurakhmonov, *Visualization and analysing the state of hydrotechnical construction via geospatial methods (on the example of Kharshi pumping stations cascade)*, IOP Conf. Ser. Earth Environ. Sci., **614** (2020)
16. R.K. Oymatov, Z.J. Mamatkulov, M.P. Reimov, R.I. Makhsudov, R.N. Jaksibaev, *Methodology development for creating agricultural interactive maps*, IOP Conf. Ser. Earth Environ. Sci., **868** (2021)
17. A. Inamov, N. Avilova, D. Norbaeva, S. Mukhammadayubova, M. Idirova, J. Vakhobov, *Application of GIS technologies in quality management of land accounting in Uzbekistan*, E3S Web Conf., **258** (2021)
18. A.R. Babajanov, B.N. Inamov, *Issues of involvement in circulation of unused agricultural lands in Uzbekistan*, IOP Conf. Ser. Earth Environ. Sci., **614** (2020)
19. A. Inamov, A. Ruziev, S. Nurjanov, *Interpolation in smoothing tin model of the earth*, IOP Conf. Ser. Mater. Sci. Eng., **1030** (2021)
20. V. Nilipovskiy, A. Inamov, *Digital land registration: practical aspects of application in Uzbekistan*, International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM (2020)
21. I. Aslanov, S. Khasanov, Y. Khudaybergenov, M. Groll, Ch.C. Opp, F. Li, E.R. Del-Valle, *Land cover-adjusted index for the former Aral Sea using Landsat images*, J. E3S Web Conf., **227** (2021)
22. I. Aslanov, U. Mukhtorov, R. Mahsudov, U. Makhmudova, S. Alimova, L. Djurayeva, O. Ibragimov, *Applying remote sensing techniques to monitor green areas in Tashkent Uzbekistan*, J. E3S Web Conf., **258** (2021)
23. I. Aslanov, S. Kholdorov, S. Ochilov, A. Jumanov, Z. Jabbarov, I. Jumaniyazov, N. Namozov, *Evaluation of soil salinity level through using Landsat-8 OLI in Central Fergana valley, Uzbekistan*, J. E3S Web Conf., **258** (2021)
24. S. Narbaev, S. Abdurahmanov, O. Allanazarov, A. Talgatovna, I. Aslanov, *Modernization of telecommunication networks on the basis of studying demographic processes using GIS*, J. E3S Web Conf., **263** (2021)
25. S. Kholdorov, Z. Jabbarov, I. Aslanov, B. Jobborov, Z. Rakhmatov, *Analysing effect of cement manufacturing industry on soils and agricultural plants*, J. E3S Web Conf., **284** (2021)
26. M. Lehoczky, Z. Abdurakhmonov, *Present software of photogrammetric processing of digital images*, J. E3S Web of Conferences, **227** (2021)

27. V. Balázsik, Z. Tóth, I. Abdurahmanov, *Analysis of Data Acquisition Accuracy with UAV*, *Int. J. Geoinformatics*, **17** (2021)
28. A. Babajanov, R. Abdiramanov, I. Abdurahmanov, U. Islomov, *Advantages of formation non-agricultural land allocation projects based on GIS technologies*, *J. E3S Web Conf.*, **227** (2021)