

THE IMPLEMENTATION STATUS AND CHALLENGES OVER LAND UTILIZATION PROJECTS, PROVIDING ECOLOGICAL AND ECONOMICAL BACKGROUND ON CROP ROTATION AND LAND ORGANIZATION

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The modern state of land development, providing ecological and economical background on crop rotation and land organization, has been analyzed. Features and issues of the utilization projects introduction mechanism have been clarified. An effectiveness of proactive measures to accelerate the utilization projects introduction process has been demonstrated.

Keywords: *land utilization, land utilization projects, agricultural land, crop rotation.*

Problem

Almost completed landed reform left the far of open questions which today grew into ecological and economical problems. The special place among them is occupied by technologies of the agricultural land utilization by agrarian enterprises. It is in common knowledge that during the land reform there were created a lot of agrarian formations from small farmers' enterprises to big holdings. During this process already existing and new projects of land utilization, sizes and crops changes were destroyed.

It was possible to avoid such situation due to timely created and implemented scientifically based projects of land utilization. But, unfortunately, during reformation the amount of customers of land utilization documentation, which could provide rational organization of territory, fallen down to zero, and on the first plan went out

technically simple land cadastre works, ownership registration projects and establishment the strips of land limits. The land utilization projects, which could provide effective organization of territory of the modern agricultural formations, are forgotten today, and in fact agricultural lands suffer from the uncontrolled growing soya, sunflower and other soil exhausting cultures.

Researches and publications review

Land use has aroused increasing attention of scientists of Ukraine. Among them are D.I. Bambindra, V.V. Gorlachuk, G.D. Gutsulyak, D.S. Dobriak, O.P. Kanash, L.Y. Novakovskiy, I.A. Rozumnyi, A.Y. Sokhnych, M.G. Stupen, O.G. Tarariko, A.M. Tretyak, M.A. Khvesyk, O.I. Furdychko. Theoretical mechanism of organizational, law, ecological and economical aspects of land utilization were developed by them.

Organization of land utilization projects were highlighted in papers of the following scientists A.V. Barvinskyi, O.S. Dorosh, Y.M. Dorosh, T.O. Yevsiukov, V.M. Kilochko, L.V. Kornilov, A.I. Krysak, A.G. Martyn, M.P. Stetsyuk, R.V. Tykhenko, A.M. Shvorak. Methods and problems of land use documentation, way of creation and completion, general review on the basic concepts, background, and Progress on the methodologies of project works and economical effectiveness of land utilization were defined by them.

Goal of a paper is a recognition of the causes of negative situation and providing background for mechanism of limitation the drawbacks of land utilization projects implementation.

Main results

Based on public information about development of projects of land utilization as on 1st of July 2013 that provide the ecological and economical base of crop rotations and equipping with modern amenities of lands (tabl.1) we will find out the features of mechanism of introduction of projects of land utilization and will set the possible ways of its improvement.

Actual data of the developed projects and amount of the agreements for their development considered as random value. As a result of statistical treatment of this information we got the statistical descriptions of the set of the developed projects and agreements (mean arithmetic, middle quadratic deviation, coefficient of variation).

According to this data was made a prediction about the possible law of distributing of these sets. A hypothesis about the type of distributing law was tested according to the criterion of Kolmogorov. In addition, with the use of

correlation analysis were found out effectiveness of two types of measures on the acceleration of introduction of projects of land utilization (passive and active). To the active measures we related the administrative measures (conferences, seminars), to passive we related activity of mass media (publish in the periodic press and scientific editions, information on radio and on television).

A large number of project documentation types is included into the land utilization actions [6, p.156], and it should be noted that land utilization projects deserve a special attention now, provide ecological and economic assessment of crop rotation and regulation of land. These works now attracted the attention of state authorities, local authorities, workers in the field of land utilization including agricultural enterprises.

Considerable attention to this type of work on land utilization is caused by Verkhovna Rada of Ukraine Law adoption "On Amendments to Certain Legislative Acts of Ukraine regarding the preservation of soil fertility" in 2009, which has entered into force on 9th of August 2010. According to this Law, agricultural land for commercial agricultural production is used in a concert with the established and duly approved land utilization projects, providing an effective structure of crop rotation and land organization with ecological and economic positions, as well as provide measures to protect the land. The use of these land parcels entails a fine on citizens from fifty to one hundred untaxed minimum incomes of citizens and on officials - from three hundred to five hundred untaxed minimum incomes of citizens without approved in cases determined by the law of land utilization projects

that provide ecological and economic organization. [2].
assessment of crop rotation and land

1. State of development of projects of land utilization, which provide the ecological and economical base of crop rotations and equipping as on 01/06/2013

№	Administrative unit	Amount of enterprises which use lands with an area over 100 hectares	Amount of enterprises which have projects of ecological and economical base of crop rotations	Amount of agreements for development of projects of ecological and economical base of crop rotations	Explanatory work	
					Amount of meetings with producers	An amount of publications in mass media
1	2	3	4	5	6	7
1	Autonomous Republic of Crimea	770	21	202	212	83
2	Vinnitsya Region	1366	24	332	87	33
3	Volyn region	284	25	44	79	75
4	Dnipropetrovs'k Region	1501	0	8	86	31
5	Donets'k Region	734	35	108	228	1031
6	Zhytomyr Region	450	13	58	218	41
7	Zakarpattya Region	36	0	1	13	23
8	Zaporizhzhya Region	1257	23	299	278	109
9	Ivano-Frankivs'k Region	105	0	6	58	35
10	Kyiv Region	781	7	89	202	44
11	Kirovograd Region	1327	103	138	285	75
12	Luhans'k Region	747	34	105	78	50
13	Lviv Region	334	1	15	49	15
14	Mykolayiv Region	1077	0	32	248	128
15	Odesa Region	1110	27	92	137	59
16	Poltava Region	1162	6	331	105	36
17	Rivne Region	206	3	55	77	37
18	Sumy Region	540	11	209	168	615
19	Ternopil Region	379	5	136	91	28
20	Kharkiv Region	996	15	294	174	870
21	Kherson Region	1074	22	153	191	67
22	Khmelnitsky Region	600	26	140	82	50
23	Cherkasy Region	956	2	90	46	26
24	Chernivetski Region	131	2	15	40	12
25	Chernihiv Region	627	0	159	110	12
26	The City of Sevastopol	9	1	3	1	11
27	The City of Kyiv	1	0	1	12	15
	Ukraine	18560	406	3115	3355	3611

Source: [9]

This law was modified twice with amendments. According to the latest, the penalty shall be applied from 1st of January 2013. It should be noted that

under paragraph 18 of the transitional provisions of the Land Code of Ukraine by 25.10.2001 № 2768-III (with amendments), for the period till January 1st, 2015 the requirements to project development are valid only for those owners and users who utilize agricultural land for commercial agricultural production with a total area over 100 acres [4].

Let's try to figure out the dynamics of this process, since the terms of land utilization projects development for agricultural enterprises that use the ground areas for agricultural production of more than 100 hectares, providing ecological and economical justification of crop rotation and streamline of land, have been started.

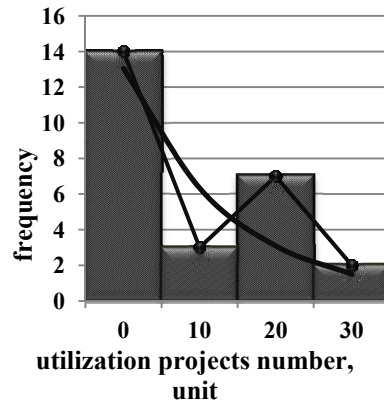
The statistical processing information about the land utilization projects creating and using are summarized in Table. 2.

2. Statistical characteristics of the land utilization projects and contracts distribution for the development as random variables.

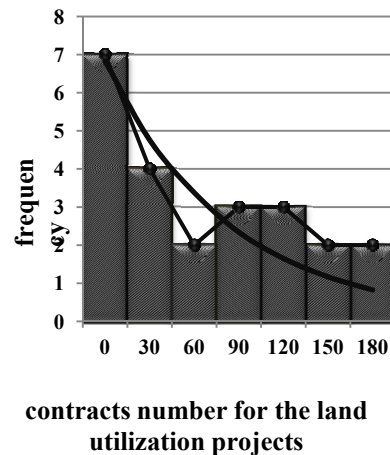
Statistical description	Projects number	Contracts number
The arithmetic mean, unit	13.84	81.52
The mean square deviation, unit	10.50	61.30
The coefficient of variation, %	75.90	75.10

Basing on the data of Table 2, we put forward a hypothesis about the distribution law form of the target population (the number of land utilization projects and contracts for the development). Similar by value both 13.84 arithmetic mean and mean square deviation as it is known from [7] could be an indication that the

target population (the land utilization projects number and the contracts number) can be approximated by an exponential law distribution of land utilization projects and contracts for the development, graphical interpretation of which is shown in Fig. 1.



a)



b)

—●— experimental data
— exponential distribution curve

Fig.1. Approximation of the land utilization projects distribution (a) of the contracts number for the land utilization projects development (b) by the exponential law of distribution (for the period from 09.08.2010 till 06.01.2013)

In this case, by the $P(\lambda)$ Kolmogorov criterion, who assesses the proximity of the actual distribution to the theoretical, if the $P(\lambda)$ value is large enough then hypothesis of an exponential distribution law of the target population is confirmed [1, p.374]. In this case $P(\lambda)$ for the number of land utilization projects amounts to 0.97, for the number of concluded contracts – 1.00. So it's safe to say that the distribution of both populations investigated is securely approximated by the exponential law.

From [11] it is known that the statistical populations, satisfactorily approximated by exponential law, are highly resistant to changing in number. This indicates that the process would go sluggishly or even completely stay without applying additional measures. This conclusion is confirmed by the close values of the variation coefficients that equal up to the first mark of the tithe 75.90 and 75.10 respectively (table 2).

Data of the Table. 1 enables us not only to examine the dynamics of the land utilization projects and contracts development for the creation, but also to find the interrelation between the two types of measures to accelerate the implementation of land utilization projects (table 3).

The data obtained indicates that the interrelations is closer between the development the contract conclusion on the development of land utilization projects that provide ecological and economic assessment of crop rotation and land organization as well as public outreach activities than between the number of articles, publications, other type of Internet network and mass media. Research of correlative

dependence has showed that active measures such as meetings with agricultural producers is more efficient than the dissemination of information through the mass media and articles of Internet network.

3. Correlation interdependence between explanatory activities and the number of land utilization projects as well as contracts for the development.

correlation coefficient		
Indicators	the number of meetings held with producers	the number of articles, media coverage, website, etc.
Number of land utilization projects	0.54	0.16
Number of contracts for the land utilization project development	0.43	0.30

Investigation over the dynamics process of the land utilization projects development that provide an ecological and economic assessment of the crop rotation and land organization has showed that this process is sluggish and even the number of outreach activities carried out only in a small way affects the process design and contracting for the creation of land utilization projects. It means, that the development of land utilization projects should be improved.

We have analyzed a legislative basis and consulted with the developers of the project documentation within this sphere. We

have found that the main obstacle is the economic and legal issues relating to both customers and developers of project documentation - land utilization projects that provide ecological and economic assessment of crop rotation and land organization.

Information support of the project.

According to the "Procedure for the land utilization projects development that provide ecological and economic assessment of crop rotation and land organization", approved by the Cabinet of Ministers of Ukraine by 02.11.2011, № 1134, minimal essential information support for the drafting of land use are:

- fields and land agrochemical passport copies;
- copies of the documents certifying the right to land (if any);
- materials of fields history over the last three - five years;
- allocation scheme of agricultural crops predecessors [8].

Also, the customer provides developers with relevant materials of field geodetic surveys and ground surveys of land use, if any.

Materials about the agricultural land soil survey have terms of more than 25-30 years of limitation in Ukraine. Using these materials, the developers of the project documentation can not guarantee effective design solutions. Therefore, the priority of the state and land utilization is to ensure the repeat survey of soils.

Speaking of that information taken from agrochemical passports could be the basis for the information, it should be noted that these passports in its content reflect the characteristics of the agrochemical field without

reference to a particular soil. They provide information about the phosphorus, potassium, nitrogen, humus provision in the field and soil acidity etc. [5, p.12]. Modern agri-passports, unfortunately, do not give information about the location and geomorphological conditions of the soils existence, and the flushing and aeration degree, groundwater flooding and dissemination as well as intensity of technological processes.

1. *Human resources.* It is impossible not to note that today there are also staffing performance challenges of this type of work on land management. Latest (required) domestic economic land utilization projects were created about 30 years ago, with the collective and state farm system of land management. A lot of experts who have experience in these activities have retired and young professionals of this type of work have not performed (were mainly engaged in projects aimed at ensuring the implementation of land reform).

2. *Consolidation of land.* The importance of solving this issue is undeniable, because experience shows that the high efficiency of agricultural production can only be achieved through technological upgrading, which is impossible without consolidation of shredded land tenures [10, p.12]. In the present context, the mechanisms of land consolidation are possible through the lease, sub-lease or exchange of land parcels. According to current legislation, these procedures are used on a voluntary basis. These changes cause the need for adjustment lease agreements, and its re-registration. Exchange of land particles (shares) also requires some time and money expenditures.

Therefore, a justification of effective ways in the agricultural land consolidation is important, but at the same time it is a challenging task. The main steps on the way to solve it should be: the complex adoption of legal mechanisms to prevent further fragmentation of land; establishment of norms concerning the minimum sizes of land parcels, that are not a subject to division during inheritance; development of the mechanism to provide the priority right in case of sale of agricultural land.

3. *Change in the land parcels ground composition.* According to Article 52 of the Law of Ukraine by 22.05.2003 № 858-IV 'On Land Utilization', projects of crop rotation, inter alia, provide for regulation of agricultural land, as well as containing design decisions regarding the placement of industrial buildings and structures [3]. Since a considerable portion of agricultural land is under lease, change in the composition of land is an extremely challenging task, which can be solved by providing incentives to owners for the taxation of land.

Currently, a large number of degraded and unproductive land is under cultivation. In accordance with the environmental requirements, land utilization projects should provide other ways of using the degraded arable lands: creation of afforestations, permanent meadowing, transformation in hayfields and pastures, the transfer to the land of recreational use and so on.

Accordingly, these design decisions lead to a reduction of sown areas that will affect the economic performance of enterprises. Change in the composition of land is also to

affect the interrelations between the owners land particles (shares).

4. Therefore, changing the use of degraded and unproductive lands is actually impossible without solving the issues on economic incentives for land owners and agricultural enterprises.

5. *Terms of land lease.* Elaboration of drafts on land utilization hamper a short-term lease of land contracts on which are concluded for a period of 4-5 years [6, p.156]. It is very difficult at such circumstances to ensure the preservation and restoration of soil fertility, sustain optimal organizational and economic demands, because agricultural enterprises territory is in a constant transformation, land tenure size, tracts of land configuration change, etc. This issue can be resolved by amending the rental agreement for extension of up to ten years or even more.

6. **Conclusions.** During the research it was revealed that the number of developing land utilization projects that provide ecological and economic assessment of crop rotation and land organization is in poor condition. Exponent type of distribution indicates that the process of project development will potentially go slowly unless to introduce additional incentives. These include: public outreach activities since a correlation analysis has shown that the number of land utilization projects and amount of signed contracts for the development largely depends on the number of explanatory activities. It should be added that the dissemination of information into the mass media and the Internet network

are less effective than meetings with producers.

Public outreach activities, however, can not fully resolve the issue on drafting the land utilization without solving the spectrum of economic and organizational, as well as legal challenges. These include: information system support of the project, human resources, land consolidation, change in the grounds composition of land parcels, land lease terms.

Today, sustainable use of agricultural land should become an extremely important requirement for economic entities, as well as crop rotation - an effective and scientifically sound tool towards its solution. The adoption of the Law of Ukraine "On amendments to some legislative acts to preserve soil fertility", obliging farmers to order land utilization projects that provide ecological and economic assessment of crop rotation and land organization, was a matter of time since many unsustainable agricultural farm management methods are now upon the table. However the conclusion of such projects needs to address the following issues:

- finding the effective ways to land consolidation;
- Involvement of economic and legal mechanisms of the degraded and unproductive grounds removing from agricultural use;
- Increasing readiness to perform project works of human resources (through training courses, additional education, etc.);
- Implementation of effective mechanisms for lease relations;
- Economic stimulation of measures to protect the land parcels owners

grounds as well as agricultural enterprises.

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Проанализировано современное состояние разработки проектов землеустройства, обеспечивающих эколого-экономическое обоснование севооборотов и упорядочение угодий. Выявлено особенности и проблемы механизма внедрения проектов землеустройства.

Показана результативность активных мер ускорения процесса внедрения проектов землеустройства по сравнению с пассивными.

Ключевые слова: *землеустройство, проект землеустройства, земли сельскохозяйственного назначения, севооборот.*

Проаналізовано сучасний стан розробки проектів землеустрою, що забезпечують еколого-економічне обґрунтування сівозмін та впорядкування угідь. З'ясовано особливості та проблеми механізму запровадження проектів землеустрою. Показана результативність активних заходів прискорення процесу впровадження проектів землеустрою в порівнянні з пасивними.

Ключові слова: *землеустрій, проект землеустрою, землі сільськогосподарського призначення, сівозмін.*
