UDC 322.365:504

THE INFLUENCE OF LAND REFORM ON TRANSFORMATION OF AGRICULTURAL LAND USE IN THE POLTAVA REGION

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In this article transformational changes in agricultural land use in Poltava region during the land reform were analyzed. The researchers determined the changes in the structure of land, agricultural goods produced by different farms and characterized the implementation of measures to protect the land.
Keywords: *land use, transformation processes, land protection, Poltava region.*

Problem formulation

In the process of a land reform, which has been continuing in Ukraine since 1991, different forms of land ownership developed. Public relations connected with land use and land protection have also changed a lot. As a result of the reform, appropriate transformations of agricultural land use took place. Many changes occurred within the forms of agriculture (including corporatisation of agriculture sector). The institute of lease of land became dominant, on its basis the most of agricultural land, including arable land, is used. Significant changes in land use and intensification of production usually lead to deterioration and degradation of land resources.

The lack of real interest in the long-term conservation of soil fertility among the vast majority of land owners and land users, as well as proper state control over land use and protection, monitoring qualitative and quantitative characteristics of the land cause deterioration of the ecological status of agricultural land use.

Previous research and publications analysis

In recent years, research on the transformation processes of land use is very active. The scientific works by A. Danilenko, D. Dobryak, A. Dankevich, A. Martyn, V. Mesel-Veselyak, L. Nowakowskiy, B. Pashaver, A. Tretiak, M. Fedorov and other scientists are dedicated to the analysis of different stages of transformation of land relations, creation environmentally safe and cost-effective use of land in Ukraine. Although there is a wide range of controversial issues such as the definition and principles of sustainable land use, better state and public control of land use, reducing the level of soil erosion.

Aim of the research

The assessment of transformation of agricultural land use that has occurred

during the land reform in Poltava region.

Results of the research

The transition to a market economy has caused large-scale privatization of state-owned land. As the result, virtually every peasant was able to get a land part (share) and the possibility of self-management on the ground. However, because of the lack of material and technical basis, necessary knowledge and entrepreneurial skills, land reform initially led to a significant decline in agricultural production (fig. 1).

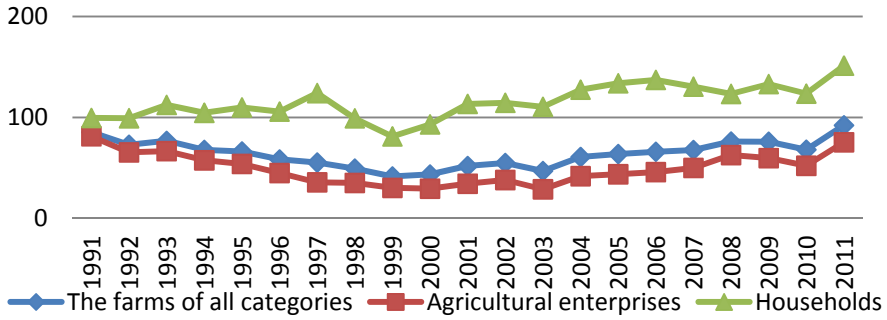

Fig. 1. Indices of agricultural production [11]

Transformation processes in agricultural land use in the Poltava region is not different from the other regions but it has their own characteristics. The region occupies an important place in the agricultural sector of Ukraine (table. 1).

1. The share of the Poltava Oblast in Ukraine's economy

Indicator	The share of the Poltava Oblast in Ukraine's economy, %				
	1990	1995	2000	2005	2010
Territory	4,8	4,8	4,8	4,8	4,8
Population	3,4	3,4	3,4	3,3	3,3
Agricultural products	5,2	5,3	4,2	5,2	5,1
Grains and legumes	6,8	-	5,8	7,5	7,2
sugar beet	10,4	-	7,4	10,0	13,1
potato	3,6	-	3,5	4,9	4,3
vegetables	4,3	-	3,4	4,8	5,0
Head of livestock					
Cattle: including cows	5,1 4,9	- -	5,3 4,7	5,4 4,9	5,9 5,2
Pigs	6,8	-	5,4	4,6	4,5
Sheep and goats	4,6	-	3,4	3,0	2,4
Poultry	4,1	-	4,7	3,5	2,3

Formed by materials [11].

The largest part in the structure of agricultural land is farmland, a floor area of 2168,2 thousand hectares or 75,4 % of the region or 97,4 % of the

total area of agricultural land. Agricultural land in terms of regions varies 60-90 % of the total area, which affects the ecological stability of the territory and agricultural landscapes.

Over the years the land reform area of agricultural land decreased by 26,9 thousand hectares of agricultural land – 22,1 (1 %), including arable land – 60,1 thousand hectares (3 %) (table 2). Total territory of the region has high agricultural development.

The transformation of land relations, which occurs without making adequate state measures to protect lands, further aggravated the problem of land use. Not quite used bioclimatic opportunities in agriculture. Energy consumption per unit of production is 2-3 times higher than in developed countries. The transition to a market situation where there is a spontaneous creation of new agricultural enterprises without sufficient scientific and methodological, organizational and financial security are violated almost all rotation. As a result, almost twice as increasing the area under crops, which increase the action of erosion, which leads to a significant increase in land degradation and eroded arable land [2].

Table 2. Dynamics of changes in the structure of the land of the Poltava region, thousand hectares

Type of land	Structure of the land, thou. ha								Changes from 1993 to 2012, thou. ha
	1993	1996	2001	2004	2006	2008	2010	2012	
Agricultural earth	2253,4	2247,2	2244,4	2240,3	2238,3	2235,3	2232,0	2226,5	-26,9
Agricultural land	2190,3	2188,0	2186,1	2182,7	2180,5	2177,4	2173,9	2168,2	-22,1
of which: arable land	1830,6	1827,1	1763,9	1759,3	1760,0	1769,4	1768,6	1770,5	-60,1
perennial plantings	31	30,2	30,1	30,0	30,0	30,0	29,7	29,0	-2
hayfield	149,1	150,3	159,5	157,2	156,3	162,4	162,3	162,1	13
pasture	179,6	180,4	190,9	190,6	190,1	203,5	202,5	201,7	22,1
Forest and perennial plants	268,2	271,8	271,1	274,2	275,9	277,9	280,9	283,8	15,6
builds' land	103,5	104,2	112,4	113,0	113,8	114,7	115,6	118,2	14,7
wetlands	85,7	87,2	85,9	85,9	85,8	85,9	85,6	85,4	-0,3
land without vegetative cover	16,1	15,8	12,9	13,2	12,9	12,9	12,7	12,7	-3,4
water	148,1	148,8	148,3	148,4	148,3	148,3	148,2	148,4	0,3
Total	2875	2875	2875	2875	2875	2875	2875	2875	

Formed by materials [11]

The region holds a wealth of valuable soils. On its territory there are 889.3 thousand hectares of valuable arable land of national importance,

hence the need for it sustainable use [9].

Officially, the land resource is estimated as close to the critical and transformational time it gets worse [8]. The studying of negative effects and the lack of materials for monitoring of degraded land areas and manifestations of erosion complicate the situation.

A large area of soil area exposed to water and wind erosion. The total area of eroded and erosion-prone lands reached 749,3 thousand hectares of which 694.4 thousand hectares of arable land [10].

Eroded land has about 420,3 thousand hectares, which is exposed to water erosion 369,2 thou. ha including 310,1 thou. hectares of arable land from which strongly eroded are 8 thou. ha medium eroded – 51,0 thou. ha low eroded – 251,0 thou. ha. The main part of eroded lands is situated in the northern and north-western parts of the region, and along the right bank of the rivers [4].

Deflation subjected to 51 thou. ha, including 51,0 thou. ha of arable land. Furthermore 328,9 thou. ha of agricultural land area relating to dangerous deflationary, including low deflated – 205,4 thou. ha medium deflated – 110,6 thou. ha strongly deflated – 12,8 thou. ha. The most of these lands are situated in Kobeliatsky, Novosandzharskyi, Kremenchug, Poltava and Kotelevsky region [4].

Despite the uncontrolled spread of erosion of soil degradation, most of the losses falls to the dehumification process, causing significant economic damage in lost earnings, future loss of land degradation and total social losses from deterioration of the national wealth. So the basic position of sustainable development doesn't perform

The biggest losses of fertility are the soil with high humus content. Changes in soil humus content of the region for the 30-year period were in the range of 0,3 to 27 %. Most humus content decreased in Chutovsky, Karlovsky, Dicanskiy, NovoSanjarsky region – 1,46, 1,27, 1,05, 1,04 % respectively. So much of the chernozem moved from the category of high humus content to increased content.

The average annual losses of reduction of humus content in the Poltava region reach 1,44 million tons, provided the total mass in the soil layer 0-30 cm - 3600 t/ha (for most guest researchers, the average loss of humus, determined by the method of calculating the balance of humus is slightly lower – 0,6-0,7 t/ha) [7].

Table 3. The organic and mineral fertilizers in the Poltava region, ton per 1 ha of cultivated area

	1990	**2000**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Organic fertilizer	120	6	27	30	39	55	75	53	68	73
Mineral fertilizer	8,8	1,9	1,5	1,3	1,3	1,1	1,2	1,4	1,3	1,0

Formed by materials [11]

The total losses of humus for 30 years (1981-2010) amounted to 43,2 million tons. If you use the cost approach, taking into account costs of mineral and organic fertilizers to restore it ($ 200 - according to S. Bulygina [5]), over the period of Poltava land suffered a loss of 77,8 bil-

lion.uah, or 2,6 billion uah each year, representing about 24 % of gross agricultural products in 2010 (11 billion. uah).

In spite of the degradation processes in general soil conditions are favorable for high yields of all crops [4].

To ensure the normal development of plants and increase soil quality necessary to make mineral and organic fertilizers. But in practice, significantly reduced use of mineral and organic fertilizers for crops as compared to 1990, per 1 ha of cultivated area (table 3).

The soil scientists talk about the effectiveness of minerals fertilizers in combination with organic, arguing that long-term application of mineral is one of the problems for the loss of humus in the soil [7].

Complicating the situation market for agricultural products, this dictates the terms of sales and growth. As a result, the area grew more energy intensive crops in cultivated area farms (table. 4) compared to 1990, sometimes higher than regional norms of their cultivation.

Table 4. The structure of sown areas, %

	1990	**1995**	**2000**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
In the region											
Grains and legumes	46,3	45,9	51,4	61,8	58,4	56,6	60,5	61,6	60,3	55,3	58,1
Technical crops	14,6	14,8	16,8	17,5	22,4	26,4	23,8	24	25,2	29,8	27,3
Sunflower	4,7	6,4	10,5	9,8	11,9	11,8	10,4	12,5	12,9	14,0	13,8
Potato and vegetable and melon crops	4,7	5,1	6,3	5,5	5,4	5,4	5,3	5,1	5,2	5,3	5,5
Forage crops	34,4	34,2	25,5	15,2	13,8	11,6	10,4	9,3	9,3	9,6	9,1
In the Ukraine											
Grains and legumes	45	45,7	57,6	-	50,2	-	-	57,6	58,7	56	56,8
Technical crops	11,6	12,1	15,4	-	20,2	-	-	25	24,3	27,1	26,9
Sunflower	5,0	6,5	10,8		14,4			15,9	15,7	17,0	17,1
Potato and vegetable and melon crops	6,4	7	8,4	-	7,8	-	-	7,3	7,2	7,3	7,3
Forage crops	37	35,2	26	-	14,4	-	-	10,1	9,8	9,6	9

Formed by materials [11-12]

Also, a significant concern is the reduction measures to protect the land, reducing their funding. Almost not conducted supervision over the operation of ongoing activities (hydraulic structures, shafts, shelterbelts, etc.), which greatly reduces their effectiveness and, in some cases, suspend general. No measures are taken KMOT that are currently not met. Creation

news requires substantial resources and the complexity of implementation, which is complicated fragmentation the land fund and the reluctance of producers to spend heavily on their implementation. So in 1995, was developed in 156 projects KMOT, of which 141 were implemented and spent about 610 thousand. There have been allocated for permanent meadow 2 281 ha of created soil protection rotation an area of about 32 thou. ha [10].

The agricultural land uses were significant changes. Part of the land is taken over the use of the citizens of that during the land reform increased to 504.1 thousand hectares table 5, Majority parts of the crop production in households are: potatoes, vegetables, fruits and berries, that need smaller area of land and energy recourses, table 6.

Thus the farm size optimization passed (figure. 2), and large farms that have in use more than 3000 hectares decreased [14], despite this 25 % of agricultural land in the region occupied by 17 companies [11].

Table 5. Agricultural land area by the category of owners

	1990	1995	2000	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural enterprises	2054,3	1843,3	1617,6	1417,5	1386,4	1373	1376,9	1379,2	1377,7	1372,3	1368,4
state	307,4	241,9	97,1	71,8	71,3	69,3	63,8	63,9	66,1	60,9	57,8
not state	1746,9	1601,4	1520,5	1345,7	1315,1	1303,7	1313,1	1315,3	1311,6	1311,4	1310,6
including farmers	-	31,5	76,0	148,5	152,3	162,9	182,5	199,3	198,5	199,9	205,9
Citizens	122,7	284,4	368,4	514,2	520,3	530	518,6	510,2	508,1	501,5	504,1
including private households and plot for building	98,6	200,6	217,3	239,8	240,2	240,6	240,7	240,2	239,7	236,4	235
commodity production	–	–	55,3	165,3	179,1	188,1	182,5	180	182	187	191,2

Formed by materials [11]

In the region as of 2010 is left 146 (26 %) farms assigns KSP that have legal status, founded by local people [14].

In the region gradually increasing farms amounts, that accounted 1673 in 2011 with an average size that increase (1990 to 2011) from 23,4 to 123,1 ha and increased part of gross agricultural products from 0.7 to 6,7 %. The main category of farms account for land with an area of 20,1 hectares to 50–35 %, of 50,1-100 ha – 13,3, from 100,1 to 500 hectares – 16,8 and others [11].

Labor productivity is important factor that reflects the efficiency of agriculture and are the integral part of the improvement level of use resource in agricultural land use per employed person in agriculture. Compared to 1990, it increased almost twice (177 %) [11], at the same time labor productivity in crop sector is much higher than in of animal husbandry in the Poltava region, while in Ukraine the contrary, the level of labor productivity in of animal husbandry production more the rate of crop. Partly it is related a decrease in the number of employed in agriculture, which fell by 77 %.

Table 6. Agricultural production in agricultural land use, %

Agricultural enterprises											
Grains and legumes	97	90	83	80	80	80	83	84	83	83	86
Sugar beet (factory)	-	96	92	79	81	86	90	86	90	94	95
sunflower	99	98	94	87	89	90	90	89	88	88	86
potato	30	4	1	0	0	0	0	0	1	1	2
vegetables	66	14	10	2	1	1	1	2	1	1	2
Fruits and berries	19	7	5	3	3	3	7	6	1	3	0
Households											
Grains and legumes	3	10	17	20	20	20	17	16	17	17	14
Sugar beet (factory)	-	4	8	21	19	14	10	14	10	6	5
sunflower	1	2	6	13	11	10	10	11	12	12	14
potato	70	96	99	100	100	100	100	100	99	99	98
vegetables	34	86	90	98	99	99	99	98	99	99	98
Fruits and berries	81	93	95	97	97	97	93	94	99	97	100

Formed by materials [11]

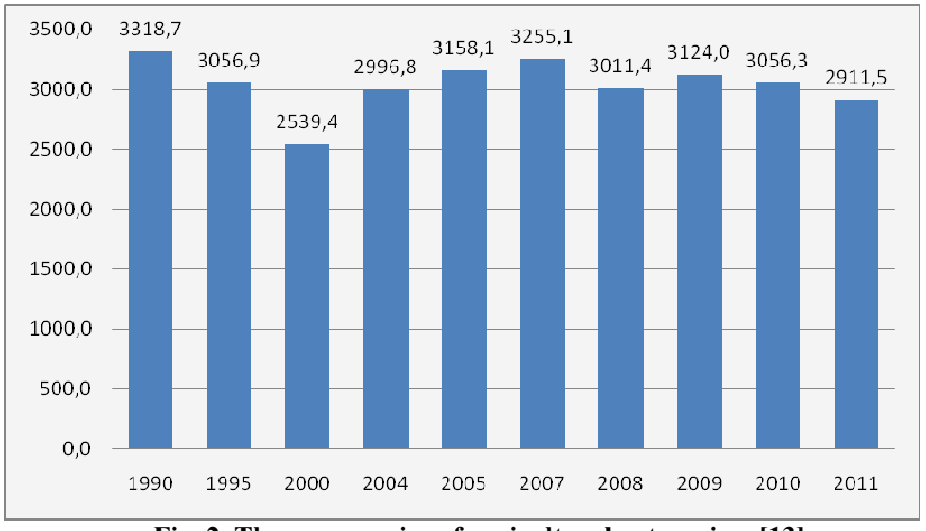

Fig. 2. The average size of agricultural enterprises [13]

Despite the positive forecasts of reforming the Soviet system of land relations there was a significant decline in agricultural development, the pace of 1990 is not reached today, caused fragmentation the country's land. Gross

agricultural production per 1 ha of agricultural land in Ukraine in 2010 was about 2700 UAH, and in 1990 - 3400 UAH [12]. Compared with 2,000 € in the EU [6]. In the Poltava region gross production per 1 ha of agricultural land in 2011 - 7970 UAH, and in 1990 - 7430 UAH [11]. Thus it is necessary noted that farms this indicator is some lower (about 6 and 7 thousand UAH in 1990 and 2011). In the land use of citizens accounted for about 29 thousand UAH per hectare in 1990, and 11 thousand UAH in 2011, which is much better developed of animal husbandry.

The conducted study allows to draw the following **conclusions**:

1. Changing of land ownership patterns and land reform implementation significantly alter the structure of the land. It has influenced on agricultural producers' efficiency and led to a decrease in agricultural products quantity.

2. The positive aspect is the reduction of agricultural land at 1 %, including 3 % of arable land, while the part of the environmentally stabilizing areas (hayfields and pastures) has increased.

3. There was redistribution of land area and agricultural products between farms and households. In most cases the production of potatoes, vegetables, fruits and berries is concentrated in households because of small areas and lower expenses

4. The area under production of energy-intensive crops has increased. Sunflower, for example, covers approximately 14 % of the cultivated area, although the optimal value is 5-9 %.

5. The decrease of humus content in the soil causes significant losses for both land owners and land users. It leeds to land degradation and a loss of profit. So, 77,8 billion UAH have been irretrievably lost, that is 2,6 billion UAH each year. That is about 24 % of gross domestic agricultural product each year (in 2010 it was 11 billion UAH). So, a large part of the black soil (chernozem) moved from the category of high humus content to increased humus content.

6. Violation of rotation unreasonably, small amount of forage crops, lack of measures for protection of land, large areas of degraded and unproductive land causing significant damage, as human activities and the environment, and only complicate the situation in the agricultural land use.

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Проаналізовано трансформаційні зміни у сільськогосподарському землекористування, що відбулись у Полтавській області за час земельної реформи. Визначено зміну структури земельних угідь, виробництва сільськогосподарської продукції різними категоріями господарств та охарактеризовано здійснення заходів з охорони земель.

Ключові слова: *землекористування, трансформаційні процеси, охорона земель, Полтавська область.*

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Проанализированы трансформационные изменения в сельскохозяйственном землепользовании, которые состоялись в Полтавской области за время земельной реформы. Определены изменение структуры земельных угодий, производства сельскохозяйственной продукции различными категориями хозяйств и охарактеризованы осуществления мероприятий по охране земель.

Ключевые слова: *землепользования, трансформационные процессы, охрана земель, Полтавская область.*