



EVALUATION OF CHANGES IN RURAL AREAS UNDER THE SELECTED MEASURES OF THE EUROPEAN UNION'S COMMON AGRICULTURAL POLICY

Franciszek Woch, Anna Jędrejek

Institute of Soil Science and Plant Cultivation – State Research Institute

Abstract

The current paper presents the results of evaluation of the influence of selected measures within Rural Development Programme (RDP), such as spatial development, afforestation, land consolidation, water management, village renewal and agri-environmental programmes on rural areas in Poland.

The data used in the study cover the years 2004-2015, and were collected from the reports of Ministry of Agriculture and Rural Development, Polish Agency for Restructuring and Modernisation of Agriculture (ARMA), Polish Central Statistical Office (CSO), with special consideration given to normative acts concerning the Rural Development Plan 2007-2013 and 2014-2020, and the results of a study on different aspects of rural development conducted at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy (IUNG-PIB).

Our study clearly shows that aforementioned measures differ significantly in terms of the level of implementation in Poland. Thus, the spatial development operation, one of the most important activities in relation to the sustainable development of rural areas, has not been introduced in RDP as a separately task. Additionally, the initiatives regarding water retention were also not fully implemented under the RDP 2007-2013 because of the shortage of time. The process of land consolidation has contributed only to very little change in land use, from about 1% in “classical” method to 4% in “complex” method of land consolidation in the total area.

On the other hand, a decline in reforestation has been observed in comparison of RDP 2004-2006 and RDP 2007-2013, which is considered to be appropriate and should lead to the target rate of afforestation of approximately 33%. The village renewal measure was entirely introduced and has a very positive effect on the agricultural environment. Agri-environmental programme plays an important role for both ecological and economical aspects of the agricultural environment and its realization covers a very wide range of actions.

In conclusion, all the analysed measures have a very positive effect on the agricultural environment. However, they should be implemented more quickly and comprehensively which should lead to a more sustainable development of rural areas in Poland.

Key words: rural areas, development of rural areas, afforestation, land consolidation, water management, village renewal.

INTRODUCTION

The concept of agricultural environment is not always properly perceived, because of its ambiguous meaning. Nevertheless, it can be understood as a collection of notions related to the agriculture and its direct surroundings, including management of rural space (spatial planning, land consolidation, water management, afforestation, village renewal and environmental protection). Agricultural environment, as a term, is closely related to the definition of rural areas. According to National Official Register of Territorial Division (TERYT) by rural areas we mean the whole area of Poland, excluding urban municipalities and urban part from urban-rural municipalities, and which constitutes about 93% of Polish territory. (*Gospodarka ziemią w rolnictwie – terminologia*, 1997; Woch *et al.*, 2015). Development of rural areas can be defined as a series of changes in a favourable direction (improving the current status) (Woch *et al.*, 2015). The above definitions specify that the issues related to rural areas include also questions concerning agricultural environment.

Changes in the agricultural environment are largely unavoidable and determined by necessary development of urbanization, transportation, various types of services and production (including agricultural production). However, all these changes are dynamic and have an effect on spatial arrangement, that is why they should be constantly monitored, in order to maintain a rational management of rural space based on an authoritative assessment of the direction and rate of changes, the quality of the landscape and the existing natural resources. Some of the aforementioned changes are also connected with the appearance of new instruments within the Common Agricultural Policy (CAP) in the Rural Development Plan 2007-2013 and 2014-2020.

The analysis of the measures, presented in this article, which are the basis for integrated (comprehensive) development of rural areas, allows an evaluation of changes in the past and forecasting within ongoing and future programming periods. The evaluations presented in this publication are the result of the research conducted at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy in the years 2012-2015 (under the statutory activity of IUNG-PIB in sub-programme 4) (Woch *et al.*, 2015). The main objective of the study was to assess an impact of selected measures within completed the CAP programme on the Polish rural areas.

METHODS

The Rural Development Plan (RDP) 2007-2013 consisted of 23 measures. For the purpose of our study six measures have been selected (afforestation, land consolidation, water management, village renewal, agri-environmental programmes and spatial development), which have a key importance for the sustainable development of rural areas. Implementation of the abovementioned measures is mainly spatial and therefore it was necessary to take into account the spatial analysis in this study.

The data used for analysis of spatial development of rural areas were derived from internet publication of Polish publishing house Wydawnictwo Edukacyjne WIKING (Demografia Polski, 2010). The analysis of population density was made using a database Geoportal. The data concerning the size of agricultural holdings were obtained from our previous studies (Woch *et al.*, 2011). Furthermore, legislative acts regarding the Rural Development Plan 2007-2013 and 2014-2020, which concerned the issue of space management were analysed. An expert method was used to evaluate the extent of the problem with spatial development and establish the mechanism of solving it (corrective mechanism).

The evaluation of changes in the agricultural environment by afforestation was conducted using an expert method and was based on the reports of the Ministry of Agriculture and Rural Development and the Polish Agency for Restructuring and Modernisation of Agriculture in Warsaw concerning the rate of afforestation works between 2004 and 2015, and the data from the Central Statistical Office of Poland about woodland and afforestation in Poland. Also, the analysis of the reports of the General Directorate of State Forests in the period of years 1995-2013 in the context of the implementation of National Programme for the Augmentation of Forest Cover (Krajowy Program Zwiększania Lesistości, 1995), have been taken into account.

Assessment of the impact of land consolidation on changes in the agricultural environment has been made as follows. Evaluation of the plot size of agricultural holdings in Poland has been made according to the 2013 data and

provided by the ARMA. An annual scope of land consolidation was based on data from the reports of the Ministry of Agriculture and Rural Development and the Polish Agency for Restructuring and Modernisation of Agriculture in Warsaw. The assessment of the scope of changes in the rural space in the process of land consolidation was done using a case-study method for selected sites (Lgota Mała-Teklinów Muni Kruszyna, Łętownia Muni Jordanów, Krajów Muni Krotoszyce, Wólka Świątkowa Muni Łuków, Marcinkowice and Przybysławice Muni Radłów, Dąbek Muni Dabrowa Zielona, Stary Majdan Muni Wojsławice, Ostrówek Kolonia Muni Ostrówek, Hruszów and Siedliszczki Muni Rejowiec) from different parts of the country where procedures (operation) of land consolidation were introduced (Słownik socjologii i nauk społecznych, 2004; Woch *et al.*, 2011).

The evaluation of management of agricultural water resources in the rural areas was based on data reported from the Ministry of Agriculture and Rural Development and the Polish Agency for Restructuring and Modernisation of Agriculture in Warsaw for the years 2007-2015. The data included also the use of funds on both national and regional levels on water management in agriculture and material scope of operation of the Rural Development Plan „Management of water resources” (Rozporządzenie, Dz.U. 2008 nr 122 poz. 791). The evaluation of reasons why the funds were used only partially was conducted using an expert method.

The evaluation of changes in the agricultural environment by measure “Village Renewal” was done using data from the reports of the Ministry of Agriculture and Rural Development and the Polish Agency for Restructuring and Modernisation of Agriculture in Warsaw for the years 2007-2015, conducted questionnaires and analyses of sites where land consolidation was done using a case-study method.

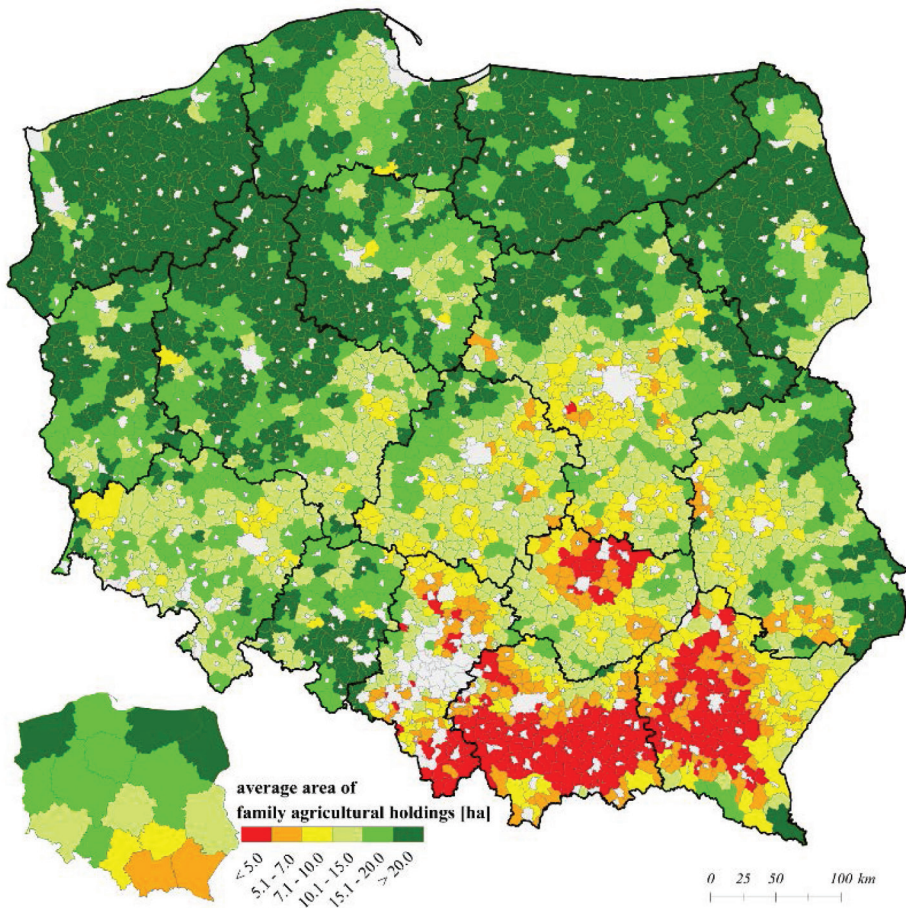
The evaluation of implementation of the agri-environmental programme was conducted using an expert method and was based on data from reports of the Ministry of Agriculture and Rural Development, the Polish Agency for Restructuring and Modernisation of Agriculture in Warsaw and Local Offices ARMA in Radom, Opatów, Lipsk for the years 2007-2015, Country Offices in Radom, Opatów, Lipsk and also Świętokrzyskie and Mazowieckie Agricultural Advisory Centres.

From the Polish Agency for Restructuring and Modernisation of Agriculture the following information was obtained: the amount of money spent on the implementation of each measure, agricultural area included in this programme and the number of households receiving financial support.

According to the rules of law in Poland, all these measures have undergone an environmental impact assessment (Ustawa, Dz. U. z 2008 nr 199 poz. 1227 z późn. zm.) and realized only these, which do not have negative impact on the environment.

RESULTS

Evaluation of changes in the spatial management. The level of spatial development in Poland is very differentiated, from a very compact (dense) settlement to place where population ratio is very small, known commonly as “demographic desert” (Woch *et al.*, 2015). Similarly is the area of family agricultural holdings (Fig. 1). In the northern and western Poland family agricultural holdings are bigger, with area of over 15 ha, while in the central and southern part of the country the majority of farms are very small and have an acreage up to 7 ha (where the estimated parity size of farm area should have more than 15 hectares).



Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on the data of ARMA from 2013.

Figure 1. The average area of family agricultural holdings in Poland.

Spatial management was not included in the RDP 2004-2006 and RDP 2007-2013. This issue is included in the RDP 2014-2020 but only concerning land consolidation. Detailed analysis included in the section about land consolidation leads to the conclusion that “classical” land consolidation only slightly changes the use of space (ca.1%) of the total area. Therefore, it must be concluded that it is not possible to realize spatial management measures only by land consolidation. Also it is not possible to reverse the trend of populating the already densely populated areas (mainly around the cities) and the depopulation of areas with very low population density, which is an unfavourable phenomenon (Woch *et al.*, 2015).

The above analysis shows that the action, which should be implemented under the RDP 2014-2020, should concern the sustainable development of settlements in rural areas with low population and depopulated areas.

Evaluation of changes in the rural areas by afforestation. Under RDP from the beginning of the Polish participation in the European Union afforestation of agricultural land is introduced by use of EU funds under this programme (Rozporządzenie, Dz. U. 2009 nr 48 poz. 390). During the RDP 2004-2006 the afforestation concerned only agricultural land and during RDP 2007-2013 also other lands including fallowed lands.

The scope of implementation of this action is presented in Table 1. It shows that during the implementation of RDP 2004-2006 about 13.4 thousand of hectares of agricultural land per year were afforested and during the implementation of the RDP 2007-2013 only about 5.0 thousand of hectares annually (4.6 thousand ha of agricultural land and 0.4 thousand ha of land other than agricultural). Decrease of the afforestation rate is presented in Figure 2.

Collated results show that the afforestation plan of former agricultural land contained in National Programme for the Augmentation of Forest Cover (Krajowy Program Zwiększania Lesistości, 1995) has been executed only in a small part. Since 2006 the expected afforestation would have about 32 thousand ha per year, but the actual afforestation was lower it was about 5-6 thousand ha per year.

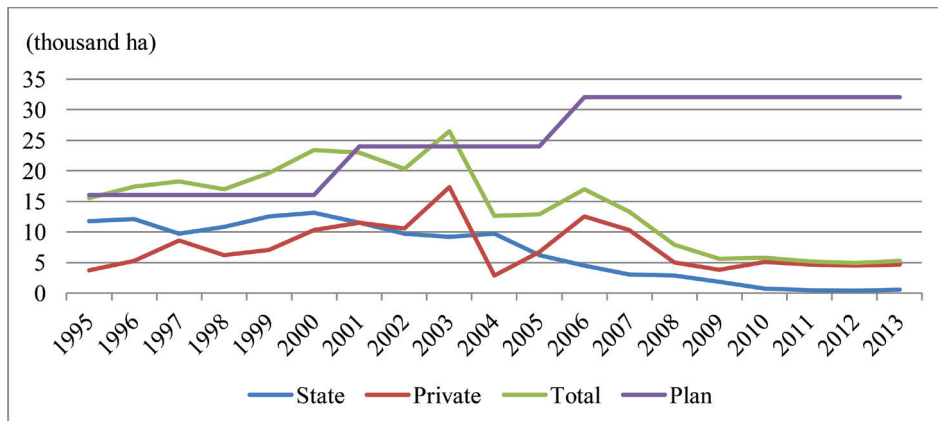
According to CSO (Rocznik statystyczny, 2014) data in the period 2004-2013 the forest area increased from 9 264 000 ha to 9 383 600 ha, by about 119 600 ha (1.29%), 75 192.99 ha (0.81%) of which as a result of RDP implementation. This means that the increase in forest area of ca. 63% was the result of the measures within the afforestation programme, the other 37% of forest area increased mainly through updating land-use registers of the previously forested land and in areas with natural succession. According to the CSO data, afforestation rate in 2013 amounted to 29.4%. The formal basis for afforestation in Poland is the National Programme for the Augmentation of Forest Cover, which provides an increase in the forest cover to 30% in 2020 and

33% in 2050. The afforestation rate for 2020 will probably be achieved. And after the correction in land management of the entire forest area with natural succession (not yet reclassified to forestry land) Poland is close to reaching the target level of the afforestation rate of 33%. Therefore the decreasing rate of afforestation can be concluded as appropriate to the objectives of the program.

Table 1. The implementation of afforestation of agricultural land and other than agricultural land in Poland under RDP 2004-2006 and 2007-2013

No.	Voivodeship	RDP2004-2006 afforestation (ha)	RDP 2007-2013 afforestation agri- cultural land (ha)	RDP 2007-2013 afforestation other than agricultural land (ha)	Total RDP2004- 2013 (ha)
1	Dolnośląskie	2 239.91	1 658.79	65.04	3 963.74
2	Kujawsko-po- morskie	2 117.03	1 474.17	74.60	3 665.80
3	Lubelskie	2 313.29	2 431.18	551.53	5 296.00
4	Lubuskie	2 340.32	1 640.00	51.79	4 032.11
5	Łódzkie	1 559.84	1 976.40	87.41	3 623.65
6	Małopolskie	214.29	240.68	42.36	497.33
7	Mazowieckie	2 978.13	4 190.14	325.64	7 493.91
8	Opolskie	388.37	439.61	42.42	870.40
9	Podkarpackie	2 927.84	1 994.98	721.57	5 644.39
10	Podlaskie	2 328.63	2 063.78	189.77	4 582.18
11	Pomorskie	2 705.29	1 744.01	39.29	4 488.59
12	Śląskie	239.53	251.25	13.30	504.08
13	Świętokrzyskie	1 601.16	1 731.12	162.78	3 495.06
14	Warmińsko-ma- zurskie	10 701.66	6 162.40	320.94	17 185.00
15	Wielkopolskie	2 064.00	1 482.10	53.17	3 599.27
16	Zachodniopo- morskie	3 469.97	2 617.56	163.95	6 251.48
Total in the country		40 189.26	32 098.17	2 905.56	75 192.99

* as on 31.12.2014



Source: State Forests National Forest Holding – www.lasy.gov.pl

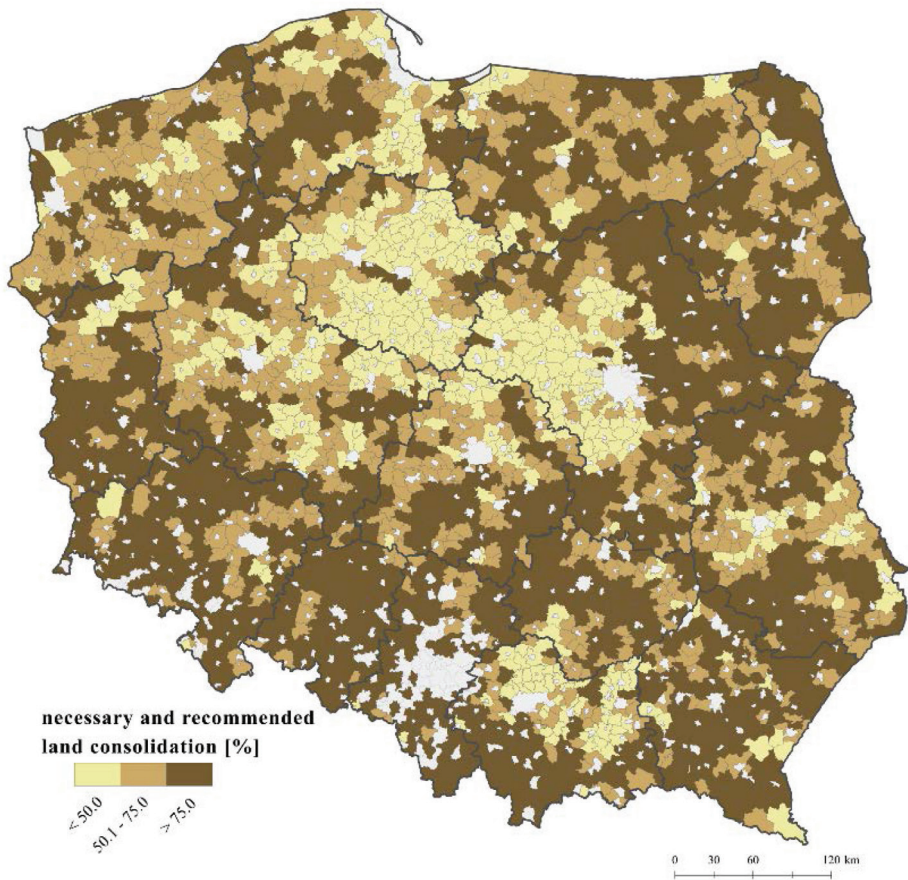
Figure 2. Afforestation in Poland in the period 1995-2013

Evaluation of changes in the rural areas by land consolidation. The needs for consolidation procedures in Poland are huge, and were established at the level of 7.1 million ha, which represents 69.10% of Polish agricultural land, including the areas of very poor land distribution (the need of necessary land consolidation) which are approx. 1.4 million ha (equivalent of about 14% of agricultural land) (Jędrejek *et al.*, 2014, Woch *et al.*, 2015).

These needs occur throughout the country, and the largest are in the southern, south-eastern and central parts of Poland (Figure 3). The rate of land consolidation and farmland exchange procedures executed in the period 2007-2013, and amounting to approx. 10 000 ha per year, was just a drop in the ocean and did not contribute to the overall improvement of the distribution of lands (Woch *et al.*, 2015, Jędrejek *et al.*, 2014).

From the time of Polish accession to the European Union the process of land consolidation is being executed only under the RDP (Rozporządzenie, Dz. U. 2008 nr 80, poz. 480). In total, during the implementation of the RDP 91.2 thousand ha were consolidated (Table 2). This execution rate of the task will not cause a significant reduction of the needs for land consolidation.

Data in Table 2 show that consolidation was conducted mainly in southern and eastern Poland. The biggest consolidations were carried out in Lubelskie Voivodeship (about 30% of total consolidated area).



Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on the data of ARMA from 2013.

Figure 3. The needs for land consolidation procedures in Poland, ranked by municipalities – together necessary and recommended land consolidation.

Based on the analysed sites where land consolidation was carried out there were evaluated changes in land use (example results are shown in Table 3 and 4). From a careful analysis of Table 3 we can see that the site Dąbek was consolidated using a “classical” method. The results of the “classical” consolidation are enlargement of plots, bringing them closer to the homesteads and partial change of agricultural road network (with widening existing). Land use of the site Dąbek shows increase only in the agricultural road area (about the 5.83 ha – 0.96% of

total) causing a decrease in arable land and grassland (Table 3). Other changes are the result of updating land-use registers and not of consolidation.

Table 2. The area of land consolidation ranked by voivodeships under RDP 2007-2013

No.	Voivodeship	Area of land consolidation*	
		ha	%
1	Dolnośląskie	10 293.64	11.28
2	Kujawsko-pomorskie	0.00	0.00
3	Lubelskie	27 498.63	30.14
4	Lubuskie	3 878.69	4.25
5	Łódzkie	1 963.34	2.15
6	Małopolskie	5 024.00	5.51
7	Mazowieckie	398.00	0.44
8	Opolskie	1 794.20	1.97
9	Podkarpackie	10 190.04	11.17
10	Podlaskie	13 327.00	14.61
11	Pomorskie	3 092.56	3.39
12	Śląskie	8 475.67	9.29
13	Świętokrzyskie	4 412.12	4.83
14	Warmińsko-mazurskie	0.00	0.00
15	Wielkopolskie	889.24	0.97
16	Zachodniopomorskie	0.00	0.00
Total in the country		91 237.13	100.00

* – total agricultural and forest area

Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on the data of ARMA in Warsaw from 30.06.2015.

The results of the research allow to conclude that the process of consolidation causes very little change in land use, from about 1% in “classical” method of land consolidation (mainly development of the network of roads) to 4% in “complex” method of land consolidation in the total area. “Complex” method consolidation causes increasing afforestation, creation of new: building lands, road network, anti-erosion meliorations, water reservoir and other measures due to local natural and economic conditions (Table 4).

Table 3. Evaluation of changes in land use site Dąbek in the process of land consolidation ('classical' method)

No.	Name of land use	Area (ha)		Difference	
		before consolidation	after consolidation	ha	%
1	Arable land	121.92	121.08	-0.84	-0.69
2	Orchards	0.00	0.00	-	-
3	Grassland	106.24	105.93	-0.31	-0.29
4	Pasture	75.67	73.84	-1.83	-2.42
3	Grassland and Pasture	181.91	179.77	-2.14	-1.18
4	Total utilised agricultural area	303.83	300.85	-2.98	-0.98
5	Forests and trees areas	261.43	258.76	-2.67	-1.02
7	Developed areas	13.61	12.55	-1.06	-7.79
8	Roads	10.45	16.28	+5.83	+55.79
9	Underwater land	12.12	9.86	-2.26	-18.65
10	Wastelands	6.42	6.38	-0.04	-0.62
11	Other areas	0.00	0.00	-	-
Total		607.86	604.68	-3.18*	-0.52*

*changes are the result of updating of land-use registers and more accurate measurements (newer precise equipment)

Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on data from the District Office in Częstochowa.

Evaluation of changes in the rural areas resulting from the management of agricultural water resources. According to data from the Ministry of Agriculture and Rural Development and the Polish Agency for Restructuring and Modernisation of Agriculture it follows that management of agricultural water resources from the time of Polish accession to the European Union is carried out under the RDP in action “Management of water resources” (Rozporządzenie, Dz.U. 2008 nr 122 poz. 791). Under the RDP 2007-2013 the total of 348 tasks were performed (289 basic drainages, 58 specific drainages and 1 complex drainage).

Within the basic drainage the following tasks were performed: flood protection (129.4 thousand ha land use); river regulation (430 km); flood embankments (220 km), canals (58 km), water intakes (201 objects), water reservoirs with a volume of over 7 million m³ (7psc.) and access roads (37 km).

Within the specific drainages the following were performed: flood protection (1.16 thousand ha land use); drained meadows and pastures (46 ha), ditches (303 km), drainage network (3 thousand km), drainage pipeline (136 km).

Table 4. Evaluation of changes in land use in object Krajów in the process of land consolidation (“complex” method).

No.	Name of land use	Current area		Changes in land use			Area after changes		Dynamics of changes
				Exemption for investment purposes	Afforestation	Construction of fish ponds			
		ha	%	Ha	ha	ha	ha	%	%
1	Arable land	358.33	71.32	-8.74	-7.00	-0.25	342.34	68.14	-3.18
2	Orchards	1.60	0.32	-	-	-	1.60	0.32	-
3	Grassland	12.32	2.45	-	-0.57	-0.65	11.10	2.21	-0.24
4	Pasture	30.70	6.11	-1.02	-0.72	-	28.96	5.76	-0.35
5	Total utilised agricultural area	402.95	80.20	-9.76	-8.29	-0.90	384.00	76.43	-3.77
6	Forests and trees areas	55.35	11.02	-	+8.29	-	63.64	12.67	+1.65
7	Developed areas	10.10	2.01	+9.76	-	-	19.86	3.95	+1.94
8	Waters	11.50	2.29	-	-	+0.90	12.40	2.47	+0.18
9	Other areas	22.49	4.48	-	-	-	22.49	4.48	-
	Total	502.39	100	9.76	8.29	0.90	502.39	100.00	3.77

Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on data from Lower Silesian Province Office of Survey and Agricultural Areas in Wrocław.

On these tasks 910.44 million PLN was spent.

The above data allow us to conclude that the RDP 2007-2013 performed a wide range of tasks. It is, however, difficult to determine the range of needs as it has been established, e.g. when it comes to the needs of land consolidation, because it is much more complicated.

A problem of water storage tasks implementation has also been defined. The needs are enormous, because recently almost every year in Poland occurs either drought or flooding. The data in Table 5 show that just over half of the funds was spent. Using the expert method it has been established that the main cause is granting funds too late for too short a time (2007-2013 + 2 years). During this period location of water reservoirs had to be established, in order to be approved in the local spatial development plan, elaborate and agree the documentation, get a construction permit and after that starting building a reservoir and at the end the factual and financial clearance.

Table 5. Implementation tasks of water storage by voivodeships under RDP 2007-2013

No.	Voivodeship	Funds (PLN)	Spent funds	
			PLN	%
1	Dolnośląskie	17 376 939.01	14 669 967.91	84.42
2	Kujawsko-pomorskie	9 633 723.43	1 243 326.96	12.91
3	Lubelskie	9 834 235.49	6 457 622.52	65.66
4	Lubuskie	13 454 474.09	3 894 781.85	28.95
5	Łódzkie	5 354 667.28	928 454.49	17.34
6	Małopolskie	1 149 904.15	172 909.42	15.04
7	Mazowieckie	20 152 756.39	19 483 174.90	96.68
8	Opolskie	4 475 471.01	2 461 167.45	54.99
9	Podkarpackie	12 237 427.98	3 006 926.65	24.57
10	Podlaskie	0.00	0.00	0.00
11	Pomorskie	11 772 472.73	0.00	0.00
12	Śląskie	4 431 821.88	0.00	0.00
13	Świętokrzyskie	0.00	0.00	0.00
14	Warmińsko-mazurskie	14 082 695.11	9 363 401.29	66.49
15	Wielkopolskie	15 554 980.35	12 478 681.79	80.22
16	Zachodniopomorskie	16 382 924.91	8 239 363.25	50.29
Total in the country		155 885 494.60	82 399 778.48	52.86

Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on the data of ARMA in Warsaw from 30.09.2015.

Evaluation of changes in the rural areas by operation „Village Renewal”. The effects of measures “Village Renewal” and “LEADER” (also about village renewal) realized in 2007-2013 (Rozporządzenie, Dz.U. 2008 nr 38 poz. 220) are shown in Table 6. These tasks in total consumed 4 496 903 686 PLN (Woch *et al.*, 2015) in which the biggest amount was spent on the establishment of recreation and sports facilities and socio-cultural measures related with the “Public infrastructure” task (in total about 2.1 billion PLN), and for the task “Meeting Social Needs in the field of sports and recreation” (in total about 1.0 billion PLN).

In Poland there are 52 433 villages (43 058 rural villages) (Rocznik Statystyczny, CSO 2014). Dividing this amount by all 18 578 tasks we get one task in 2-3 rural villages. Implementation of these measures had both a pilot nature as well as extensive character. Surveys have shown that needs for renewal of different elements are present practically in every village. This task should be implemented in the RDP 2014-2020 to a greater extent. Hence for implementing

at least one task in every Polish village at least two periods of the programme (15 years) are necessary.

Table 6. Effects of the village renewal measures under RDP 2007-2013

Name of task	Unit of measure	Effects of measures		
		Village Renewal	LEADER	Total
Public infrastructure	pcs.	5 681	4 235	9 916
Meeting Social Needs in the field of sports and recreation	km	198.43	511.06	709.49
	pcs.	3 893	3 705	7 598
Culture and heritage conservation	pcs.	688	376	1 064
Sum	pcs.	10 262	8 316	18 578
	km	198.43	511.06	709.49

Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on the data of ARMA in Warsaw from 30.09.2015

The measures under “Village Renewal” relate to a new concept in Poland. Before the accession to the European Union it was not a separate governmental programme. This action had a very positive effect on the agricultural environment.

Evaluation of changes in the rural areas by implementation of the agri-environmental programme. The agri-environmental programme was implemented only on agricultural land and under the RDP 2007-2013 (+ 2 years) with a budget of 9 210.4 million PLN planned (till the end of 2014 was spent 8 732.6 million PLN – 91.24%) (Table 7). Agri-environmental programme was implemented in nine packages (Table 7).

In total the following has been supported: 133 974 agricultural holdings (done in 67%), 3 310 728.67 ha of agricultural land (done in 159%, 17.5% the total area of agricultural land in Poland), 63 579 animals in agricultural holdings (done in 69%) (Woch *et al.*, 2015).

Data from Table 7 shows that the most popular were packages: Organic agriculture, Sustainable agriculture and Protection of soil and water, least popular: Buffer zones. Spatial analysis shown that agri-environmental programme was implemented to a greater extent in the northern compared with the southern part of the Poland (Woch *et al.*, 2015).

Detailed study of three counties of the central Poland (Opatowski, Radomski, Lipski) showed that the most popular were two packages: Organic agriculture and Protection of soil and water (Woch *et al.*, 2014 Woch *et al.*, 2015). While they were not interested in the following three packages: Preservation of endangered animal genetic resources in agriculture, both about Natura 2000. The lack of interest of farmers in the above mentioned packages was caused by the

too complicated procedures and too low payments compared to the tasks that must be done in the packages.

Table 7. Implementation of 9 packages in Agri-environmental programme under RDP 2007-2013

No.	Package name	Spent founds (mln PLN)	Execution rate (%)*	Support area (ha)	Execution rate (%)**	Number of supported farms (pcs.)	Execution rate (%)
1	Sustainable agriculture	1 318.8	21.6	1 100 948	734	34 743	579
2	Organic agriculture	1 664.3	27.3	681 161	136	29 457	118
3	Extensive permanent grassland	552.7	9.1	279 104	147	47 307	no data
4	Protection of endangered bird species and natural habitats outside the NATURA 2000 areas	513.5	8.4	162 184	74	15 902	no data
5	Protection of endangered bird species and natural habitats within the NATURA 2000 areas	731.3	12.0	189 632	50	14 874	10
6	Preservation of endangered plant genetic resources in agriculture	87.7	1.4	55 933	430	5 041	no data
7	Preservation of endangered animal genetic resources in agriculture	142.9	2.3	-	-	3476	69
8	Protection of soil and water	1 084	17.9	841 506	84	62 412	62
9	Buffer zones	1.7	0.03	no data	no data	174	87
Total		8 732.6 (9 210.4)	100.0			8 732.6 (9 210.4)	100.0

* – rate of disbursement money on implementation packages under RDP 2007-2013

** – rate of completion of each package in relation to the plan

Source: Developed at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy, and based on the data of ARMA in Warsaw from 31.12.2014

Generally one can conclude that agri-environmental programmes play a very important role, both ecological and economic, for the agricultural environment and farmers living and working there. But they have drawbacks such as too complicated procedures and too low payments for their implementation in Natura 2000 areas.

CONCLUSIONS

The analyses carried out allow to draw the following conclusions, mainly of a practical nature:

1. Sustainable spatial development is a basis for many other measures for sustainable rural development. However, the lack of its coordinated implementation in the spatial development plans at the national, provincial, and municipal levels makes it impossible to integrate rural development.
2. From the time of Polish accession to the European Union the afforestation rate is decreasing. During the implementation of RDP 2004-2006 afforestation on agricultural land amounted to about 13.4 thousand ha per year and during the implementation of RDP 2007-2013 to about 5.0 thousand ha per year. It was predicted that the afforestation area would be constantly decreasing. The decreasing rate of afforestation can be concluded as appropriate to the objectives of the program because Poland is close to reaching the target level of afforestation rate of 33%.
3. "Classical" method of land consolidation causes very small changes in land use: about 1% of total area (due to newly planned roads), while "complex" method makes changes in land use at the level of ca. 4% (due to increasing afforestation and tree areas, new building lands, new road system, new anti-erosion meliorations, construction of water reservoirs and others).
4. The measures of RDP 2007-2013 have made a large part of the tasks regarding water management but measures concerning water retention have not been fully implemented because of too short period of time for execution of the whole procedure.
5. The action of "Village Renewal" introduces a new concept in Polish conditions. It brought very positive effects on the agricultural environment, especially on the aesthetics of the built-up rural areas.
6. Agri-environmental programmes play a very important role, both ecological and economic, for the agricultural environment and are widely implemented. But they have drawbacks such as too complicated

procedures and too low payments for their implementation, especially in Natura 2000 areas.

Summarizing, it can be concluded that all analysed measures have a positive influence on agricultural environment leading Poland to the sustainable development of rural areas, but implementation of these measures should be better organised.

REFERENCES

Demografia Polski . Wydawnictwo Edukacyjne WIKING, Portal edukacyjny, www.wiking.edu.pl/article.php?id=269.

Gospodarka ziemią w rolnictwie – terminologia. Polska (1997). Norma PN-R-04151. PKN.

GUS. (2014). Rocznik Statystyczny

Jędrejek A., Szymański L., Woch F. (2014). Evaluation of the plot size (farm land) of family agricultural holdings and the needs for land consolidation in Poland. Infrastructure and Ecology of Rural Areas. No. IV/1: 1111-1125.

Jędrejek A., Woch F., Szymański L. (2014). Ocena rozdrobnienia gospodarstw rolnych dla określenia rozmiarów prac scaleniowych w Polsce. Przegląd Geodezyjny nr 10/2014, 3-12.

Krajowy Program Zwiększania Lesistości. Przyjęty przez Radę Ministrów 23 czerwca 1995 r.

Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi z dnia 14 lutego 2008 r. w sprawie szczegółowych warunków i trybu przyznawania pomocy finansowej w ramach działania Odnowa i rozwój wsi objętego Programem Rozwoju obszarów wiejskich na lata 2007-2013. Dz.U. 2008 nr 38 poz. 220

Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi z dnia 19 marca 2009 r. w sprawie szczegółowych warunków i trybu przyznawania pomocy finansowej w ramach działania. Zalesianie gruntów rolnych oraz zalesianie gruntów innych niż rolne objętego Programem Rozwoju Obszarów Wiejskich na lata 2007-2013 (Dz. U.2009 nr 48poz. 390).

Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi z dnia 24 kwietnia 2008. w sprawie szczegółowych warunków i trybu przyznawania pomocy finansowej w ramach działania Poprawianie i rozwijanie infrastruktury związanej z rozwojem i dostosowaniem rolnictwa i leśnictwa przez scalanie gruntów objętego Programem Rozwoju Obszarów Wiejskich na lata 2007-2013 (Dz. U. 2008 nr 80, poz. 480).

Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi z dnia 25 czerwca 2008 r. w sprawie szczegółowych warunków i trybu przyznawania pomocy finansowej w ramach działania Poprawianie i rozwijanie infrastruktury związanej z rozwojem i dostosowywaniem rolnictwa i leśnictwa przez gospodarowanie rolniczymi zasobami wodnymi objętego Programem Rozwoju Obszarów Wiejskich na lata 2007-2013 (Dz.U. 2008 nr 122 poz. 791).

Słownik socjologii i nauk społecznych (2004). Studium przypadku (metoda monograficzna). PWN Warszawa, 369.

Ustawa z dnia 3 października 2008 r. O udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz. U. z 2008 r. nr 199 poz. 1227 z późn. zm.).

Woch F., Kowal A., Wróblewski T. (2014). Ocena zakresu realizacji przedsięwzięć rolno-środowiskowych wspieranych środkami Unii Europejskiej na obszarze wybranych powiatów. Rocznik Świętokrzyski Seria B, Vol. 35, 93-108.

Woch F., Syp A., Nowocień E., Wawer R., Kopiński J., Zarychta M., Bochniarz A., Pietruch Cz., Jędrejek A. (2015). Ocena zmian środowiska rolniczego obszarów wiejskich pod wpływem wybranych działań Wspólnej Polityki Rolnej Unii Europejskiej. Raport z zakończonego tematu badawczego nr 4.05 w ramach działalności statutowej IUNG-PIB w Puławach, 84.

Woch F., Wierzbicki K., Eymontt A., Dziadkiewicz-Ilkowska A., Syp A., Kopiński J., Pietruch Cz., Nierubca M., Miklewski A. (2011). Efektywność gospodarcza i ekonomiczna scalania gruntów w Polsce. Monografie i Rozprawy Naukowe, Nr 32, s. 201.

Corresponding author: Prof. dr hab. inż. Franciszek Woch,
mgr inż. Anna Jędrejek

Institute of Soil Science and Plant Cultivation State Research Institute in Puławy
ul. Czartoryskich 8,
24-100 Puławy
tel.: 81-8863421 w. 382
e-mail: franciszek.woch@iung.pulawy.pl

Received: 17.10.2016

Accepted: 05.12.2016