

SUSTAINABLE RURAL LANDSCAPE DEVELOPMENT IN POLAND – CURRENT PROBLEMS

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ABSTRACT

The author discusses current issues of sustainability rural landscape from the perspective of optimal use of economical, ecological and natural resources management in Poland. Agriculture in Poland is one of the most important sectors from an economic perspective and its importance is greater than in other countries in the EU. Rural landscape is not only a place of agricultural production and farming, but also because of favourable environmental conditions, more common place of living, which would be impossible without an efficient modern infrastructure. Rural landscape in Poland is more and more often treated as ‘carbon parks’ assimilating the carbon dioxide emitted by fuel burning. Farmers are changing their role from food producers into environmental guardians.

KEY WORDS: *sustainable rural development, climate change, rural environmental infrastructure.*

JEL CODES: Q01, Q15, Q24, Q25, Q28

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Introduction

The very definition of ‘rurality’ is of course that it is a sparsely inhabited area, from which follows that it is further away from large urban areas. In short, the EU definition is based on a definition initially introduced by the OECD that a rural area is an area with a population density of less than 150 inhabitants per km². A rural region is *predominantly* rural if more than 50 % of the population of the region is living in rural communities with less than 150 inhabitants / km². According to this standard definition, more than 91 % of the territory of the EU is ‘rural’ or ‘predominantly rural’, and this area is home to more than 56 % of the EU population. Human activities, mainly in agriculture and forestry, influence the rural landscape to a large extent.

The types of farming and forest production practised in Europe today are largely governed by EU legislation and EU economic incentives, especially in EU countries. In addition, the development of other rural activities is stimulated by EU regional and rural development policies.

Natural ecosystems change, but perhaps not as drastically as human environments. However, nature in rural areas is not only affected by climate, geology and other site-specific properties, but is also much affected and sometimes more or less destroyed by human activities, especially wars, pollution, urban expansion, mining, energy installations, infrastructure, agricultural practices (Iital, 2013; Sepp, 2013).

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A process aimed at local or regional definition of sustainable rural development should always involve local stakeholders. Thus, the freedom of local people to define their own needs and take part in decisions that affect their own lives is a cornerstone in defining how to achieve sustainable rural development.

Having said that, we can only give general comments on the key challenges for sustainable rural development (Karlsson et al., 2013):

- The organisation of human activities in the landscape to protect and manage global and long-term resources.
- Keeping and maintaining ecosystems.
- Supporting long-term biodiversity.
- Establishing the necessary interactions between urban and rural areas.
- Developing a sound economy, including job opportunities, etc.
- Developing good social conditions regarding inequities, gender issues, indigenous peoples, other minority groups, etc.

1. Economic and ecological context of change in Poland

In the last 25 years the issue of sustainability beyond the short period of the beginning of economic and political changes since 1991 and partly in the course of negotiations before the Polish accession to the EU has never received a high position on the political agenda. The primary investment policy is the creation of new production capacity or new service capabilities as ends in themselves, rather than seek to meet social needs in the most cost-effective, socially and environmentally, with the use of existing assets, its modernization and change the function or the application of modern systems management (Karaczun, et al., 2015).

The year 2014 in the case of Poland is the 23 year of the continuous economic growth, reflected in the doublet value of GDP as compared with that of 1989, and reduced distance between Poland and well developed EU member states. These is the most synthetic measures of the development success in Poland. What is the share of rural areas and agriculture in this success and the benefits thus achieved (Wilkin, 2014)?

At the same time uses a significant opportunity to improve resource efficiency, so as not to waste resources in a manner characteristic of the Polish economy until 1989. The introduction of the market economy and the recession in the early stages, then the introduction of modern and therefore more fuel-efficient technologies have contributed to the economic development of the Polish virtually no increase in the consumption of resources. In the years 2000–2012, resource productivity improved by 25 % (Eurostat, 2015). But still – despite the improvement in the efficiency of utilization of natural resources – their productivity in Poland is 2–3 times lower than in the richer countries. With the increase of resource efficiency takes a major environmental infrastructure. It is worth emphasizing that purpose devoting considerable resources: the protection of the environment is guided by 7–9 % of all expenditures for investments in Poland, which is 2–2.5 billion Euro per year. Only 20 % of this amount from EU funds. In the years 1995–2012 was opened wastewater treatment plants with a total capacity of 4.3 million m³ per day, equipment to capture dust pollution of air with a capacity of 2.2 million tonnes per year and for the capture of gaseous pollutants with a capacity of 2 million tonnes per year. As a result of these investments has been a significant reduction of emissions and improving the environment, particularly water quality in rivers and lakes, and air.

In addition to the undoubted success in the traditional environment, a period of transition, characterized by rapid economic development and the creation of a consumer society foundations, brought a new threat to the environment. These are primarily: mass motorization with increasing emissions and fragmentation of the landscape through the construction of new roads:

- an increase in the mass consumer waste, including packaging;
- progressive intensification of agriculture, together with the increase of the size of farms, which threatens biodiversity;

- the rapid spread of cities – in the years 1990–2012 the share of non-agricultural lands and non-forest lands in the total area of the country has increased from 12.7 % to 22 %;
- loss of biodiversity, progressing from the western part of the Polish eastward. The largest share in the transport, agriculture and small and medium-sized enterprises, localized on natural sensitive areas;
- excessive uncontrolled tourism (also in relation to the areas protected by law).

Moreover, despite significant progress, the water quality still leaves much to be desired. In addition, while in the years 1990–2012, followed by a decrease in emissions of key pollutants, but since 2004 the rate of decline slowed significantly, due to the use of already simple ways to reduce runoff pollution (Mosiej, Bus, 2015).

2. Rural infrastructure for adapting to projected climate change

Projected climate change influence for create adaptation activity in economy. For rural areas “Effective adaptation to climate change in rural areas” was establish. In course of action “to create local monitoring and warning systems against threats”, stressed the importance of universal access to measurement data and raw data bases for research institutions. In addition, as determined necessary educational activities and dissemination principles of good practice in the rural economy, and pointed out the need for implementing adaptation policy in the modernization of the Polish countryside and take full advantage of current opportunities for rural development. In course of action “organizational and technical adaptation of agricultural and fisheries to climate change” was recommended broadening the scope of activities to support the adaptation of agriculture to climate change on water conservation topics, including by avoiding the cultivation of requiring large amounts of water and through the use of hydrogels to improve retention in the soil. It also recommended stepping up research into the species resistant to prolonged droughts and frosts. Polish costs of adapting to projected climate change is estimated at 82 billion PLZ (app. 21 billion Euro) of which 43.5 % agriculture, water management 15.3 %, forestry 4.6 %, spatial planning – 12 %. The cost of disposal losses for the years 2001–2011 amounted to a total level of 90 billion PLZ including agriculture almost 20 billion PLZ. In 2006 agricultural losses reached 15.5 billion PLZ, and spending on adaptation 8.7 billion PLZ. In the current funding period during 2014–2020 EU expenditure on adaptation to climate change will reach 20 % of the total budget (Ministry of Environment 2013). The likely consequence of inaction adaptation will be a loss of about 86 billion PZŁ in 2020, which in the years 2021–2030 may reach up to 120 billion PLZ. The costs of inaction are based on an estimate of potential losses associated with climatic events, assuming that you have not taken any additional prevention and adaptation. Loss as a percentage of GDP generated during the period to grow slightly as compared to the loss in absolute terms. This is due to the fact that a large part of the increase will be richer losses caused to the society, the accumulation of wealth and capital, and the creation of new infrastructure.

Recent years have brought severe water deficit occurring in rural areas. Particularly noticeable negative effect is observed in areas of intensive crop production, where there is a shortage of water for irrigation. In order to improve the situation in terms of improving the water balance in Poland for 15 years carried out a multiannual program for the development of small water retention. This program applies to all activities aimed at extending the ways and increase the circulation time of water in catchment areas. Typically these are actions to stop the water in the basin through water in streams and retain water reservoirs. For the small retention include the construction of water reservoirs with a capacity of less than 5 million m³ (Mosiej, 2014). A very important issue related to the implementation of the program for the construction of small water reservoirs is to shape the quality of water in these reservoirs, especially in the first years of their operation. Many studies have shown a deterioration of water quality in the reservoirs, when used for storing water from small rivers and channels with low flows (Jurik et al., 2015; Mioduszewski, 2006; 2009).

3. Agriculture landscape in Poland – current state

Given the objective the sustainable development of agriculture, food and forestry, in relation to the Polish require adaptation to national specificities resulting from the structure of Polish agriculture and the natural conditions of its development. This applies to all specific objectives: access to food, increased productivity, equal access to agricultural land and sustainable agriculture.

Polish agriculture, both in terms of how the area is arable land, as well as by the level of development and modernization that has occurred in recent years, especially after the accession to the European Union, is able not only to ensure food self-sufficiency of the country, but also produces a surplus products allocated for export. In recent years, Poland has become a major exporter among fruits, eggs and meat products. The increase in production is, however, largely at the expense of increasing the pressure exerted by it on the natural environment.

Polish rural landscape is diverse both internally and regionally. While in the west and north – western Poland is dominated by farms large, intensive agricultural production in central and southern Poland, is dominated by small farms producing mainly for their own needs. Nationally, only about 20 % of households produce for the market, resulting in most produce only or mostly for their own needs (Krasowicz, 2012). This results in a varying degree of sustainability of production: in parts of the country (central, south, and south-east of the country), agricultural production is sustainable from an environmental point of view, not exerting undue influence on them, but at the expense of economic efficiency, low production (mostly destined for own consumption) and lower farm incomes. In other regions (north-west of the country) is dominated by large intensive farms, or even industrial production of a strong, negative impact on the natural environment, but giving positive economic results and generating significant surplus crops. Strengthening the positive trend necessitates a differentiated policy to individual regions and their use in agricultural policy instruments, environmental, social and economic aimed at achieving different goals. In part this is happening, both through diversification of activities that will be supported under the provincial (regional) operational programs supported by the EU, partly through diverse possibilities of application of agricultural policy instruments in relation to the location of the holdings (agricultural subsidies led to less-favored areas, support for regional differences agri - climate – environment, development of short rotation forestry system), in part by creating special programs for underdeveloped areas (eg. Eastern Poland Operational Programme co-financed by the EU in the period 2007–2013) (Mosiej, 2014; Wróbel, 2009).

4. Equal access to land

From the point of view of the sustainability of agricultural production one of the most important factors is to ensure adequate protection of agricultural land against their permanent transfer for other purposes. Whilst the current technology allows you to run soilless cultivation, their nature is not a sustainable production traits.

Agricultural and forest land in Poland are subject to protection under the law for the protection of agricultural and forest land. On its basis for non-agricultural and non-forest can spend mostly barren, and in their absence – other land suitability lowest production. Allocating agricultural land of the highest quality for non-agricultural purposes requires the consent of the Minister of Agriculture and Rural Development, and forest land use for other purposes requires the consent of the Minister of the Environment (in the case of forest land owned by the state) or marshal of the province (in the case of private forests). Persons authorized to exclude land from production, obliged to pay the amount due and the annual fees, and for forest land – including one-time compensation.

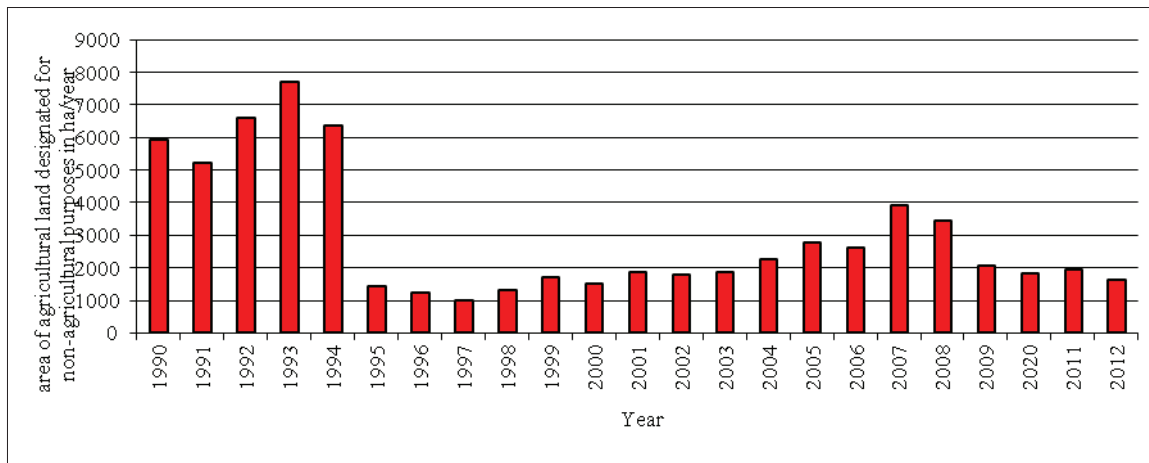


Fig. 1. The area of agricultural land designated for non-agricultural and non-forest in the years 1990–2012 ha per year

Despite theoretically adequate protection of agricultural and forest land since 1989 annually for non-agricultural purposes was spent from approx. 1 thousand to more than 6 thousands hectares of agricultural land (Fig. 1).

Transformation of agricultural soils for non-agricultural purposes, the abandonment of afforestation and sustainable use means that in the years 1989–2012 agricultural area decreased by 3,677,000 hectares (with approx. 18.7 million hectares in 1989 to 14 million hectares in 2012 – Fig. 2). In a similar extent decreased arable land (about 3.419 million hectares). This means a reduction in the production potential of Polish agriculture by more than 20 % in less than 25 years. Further loss of agricultural land at this rate, especially the highest quality classes may mean reduce the life expectancy of agricultural production and the loss of Polish food security. Therefore, from the point of view of sustainable agricultural production should be regarded as a priority the introduction of stricter requirements to protect agricultural land against their transfer to non-agricultural purposes, particularly by improving the management policy space in Poland.

In addition to protection of agricultural land against the transformation of an important factor in the efficiency and sustainability of agricultural production is the existence of a land market, where producers interested in increasing their production could acquire new land for cultivation. Unfortunately, in Poland, the market does not exist. The reason is that the possession of agricultural land, with minimal procedures necessary to keep it in good, guaranteed payments from EU funds, as well as tax benefits and pension. The result is that agricultural land prices in Poland are relatively very high, since the end of 2004, that is since Polish accession to the European Union agricultural land prices in Poland increased by 380 % and are currently about 6.5 thousand Euro / ha. It is impossible, however, to assess whether this is due to a real increase in their value and the expected benefit of its cultivation (theoretical value of agricultural products and subsidies per hectare of land in Poland is approx. 1.6 thousand Euro / year), or other factors – speculative activities and the lack of actual marketing of the land market in Poland (Agriculture land prices in Poland, 2014).

No longer the land market is one of the barriers to increasing agricultural productivity does not allow for the concentration of land in farms producing for the market. Changes in this area occur very slowly (Table 1) are still almost 50 % of agricultural land is owned farms of less than 15 hectares. In 2012, 1.8 % of the largest farms had approximately 22.3 % of agricultural land. Fragmentation of production intensified by the fact that most of the farms have agricultural lands in several plots, often spaced a considerable distance.

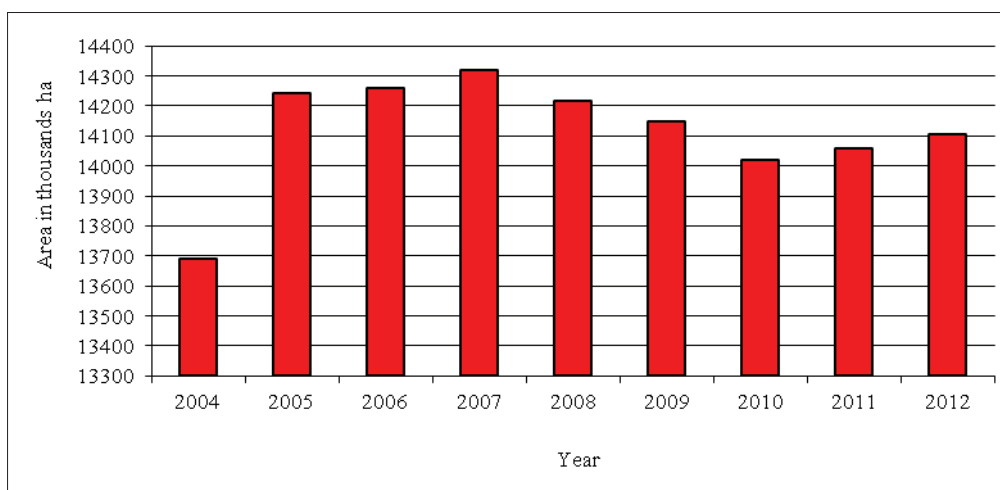


Fig. 2. The area of agricultural land in good agricultural culture in the years 2004–2012 (in thous. ha) (Kozyra and Siebielec, 2014)

Table 1. Farms by area groups in years 1988–2012 (Baer-Nawrocka & Poczta, 2014)

	Year				
	1988	1990	1996	2007	2012
Number of farms (in thous.)	2 167.6	2 137.5	2 041.4	1 804.1	1 476.7
1–2 ha (%)	18.7	17.7	22.6	23.4	20.2
2–5 ha (%)	34.8	35.1	32.7	34.0	32.6
5–10 ha (%)	29.3	29.8	25.5	22.2	23.8
10–15 ha (%)	11.2	11.3	10.6	9.2	9.8
15–20 ha (%)	6.0	6.1	4.4	4.3	5.0
20–50 ha (%)			3.7	5.7	6.8
> 50 ha (%)			0.5	1.2	1.8

As mentioned in the introduction of this study, although considerable fragmentation of farms can be considered beneficial in terms of biodiversity, it should be remembered that from the point of view of sustainable development should seek to balance environmental, social and economic. Excessive fragmentation of production, the production costs increase significantly which can lead to a simplification of the production and conduct it in a manner inconsistent with the principles of good agricultural practice. Therefore, the model should be developed that would allow for concentration of agricultural land in farms with an average size of about 30 ha.

5. Sustainable agriculture

Sustainable agricultural production method is characterized by the use of fertilizer nutrients adjusted to the needs of the plants. Total consumption of mineral fertilizers remained in Poland since 2005 at a similar level of about 20 million Mg and is almost 30 % lower than in the 80s and in 1990, but it is almost two times higher than in the first half of the 90s (Fig. 3).

This increase can be traced well in relation to the average consumption of fertilizers per unit area of agricultural crops, which in the period 1991–2012 has increased twice: in 1991 it amounted to approx. 62.1 kg / ha, and in 2012 already approx. 125 kg / ha. Although the average consumption of fertilizers in Poland is not high (in areas exposed pollution by nitrates from agricultural sources of nitrogen dose allowed in organic fertilizers (manure), up to 170 kg / ha N (in pure ingredient)), the method of fertilization differ significantly from the principles of sustainable agriculture. Only the largest farm commodity demand leads constant monitoring of soil nutrients and on its basis prepare annual plans and apply fertilizer.

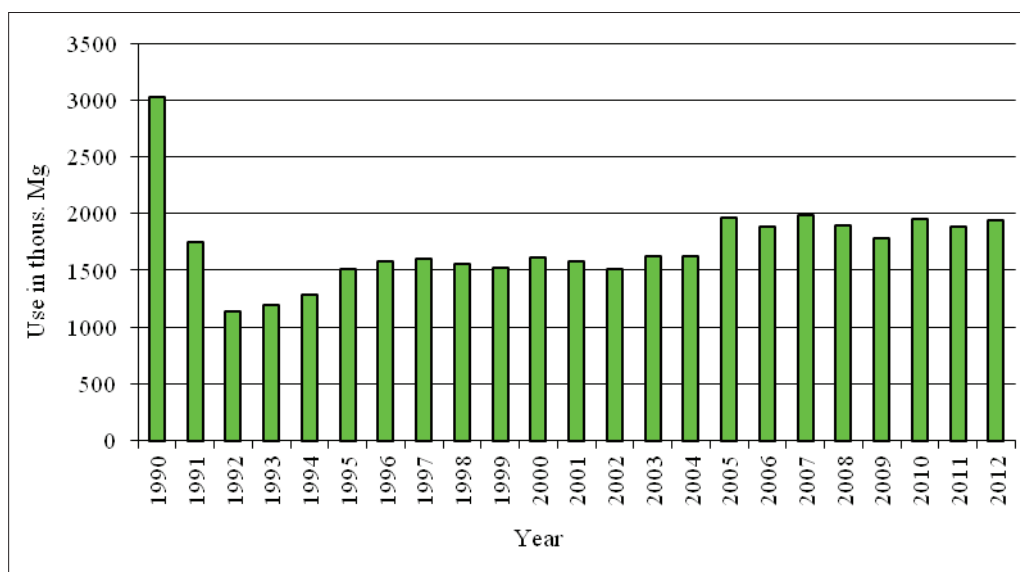


Fig. 3. Changes in the use of mineral fertilizers in Poland in the years 1990–2012 (thous. Mg) (Central Statistical Office, 2014)

On the other hand is a worrying drop in calcium fertilization (to de-acidification of soils) of 117.2 kg / ha to approx. 34 kg / ha). This creates a significant threat to the stability of agricultural production due to the high proportion of acidic soils in Poland. In an acidic environment easily accessible to plants become contaminants in the soil – especially heavy metals, but also of pesticide residues. Acidic soils have a limited production capacity, which causes a decrease in the size of the yield earned on them. Acidification of soils affects biodiversity found in the organism.

Problems of improper use of fertilizers and liming grow despite limiting the broad educational activities carried out by the agricultural advisory services. It seems that their scope will be limited if the greater number of farms will result in the production of marketable.

Also of concern is the increase in the use of pesticides, which occurred after Poland's membership in the European Union (Fig. 4).

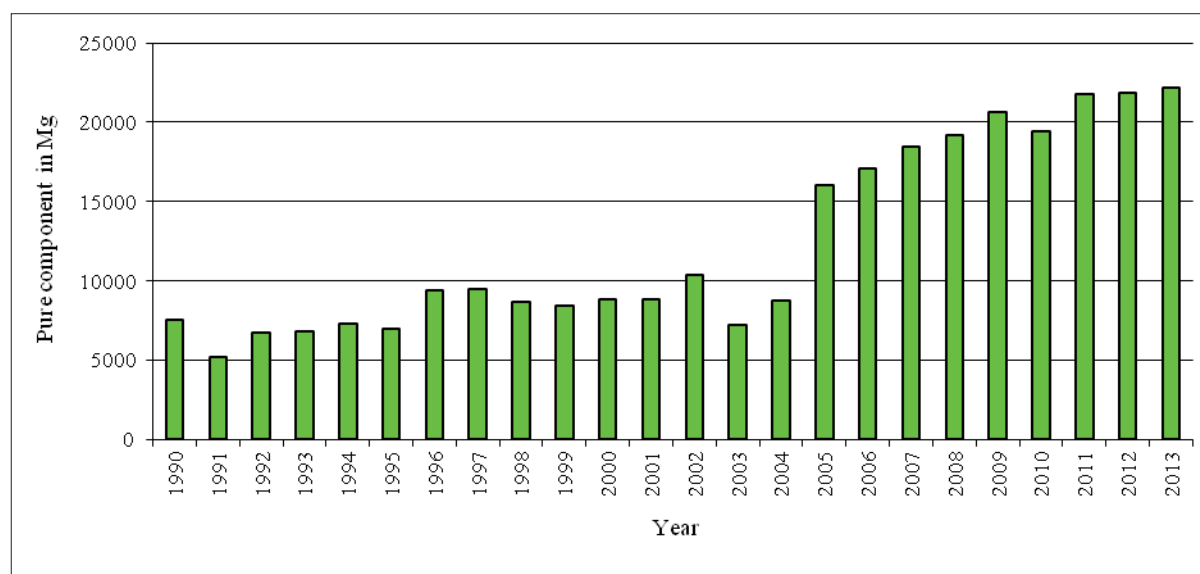


Fig. 4. Purchase of pesticides in Poland in the years 1990–2013 (Mg pure component) (Central Statistical Office, 2014)

Although the data presented in the figure does not fully reflect the size of the consumption of plant protection products, as the present volume of their sales on the Polish market, it is likely to be considered that they accurately reflect the growing trend of increased consumption of pesticides in Polish agriculture. According to these data, the current consumption is three times higher than in 1991. As it seems, in fact, did not occur until such a significant increase in the use of pesticides, but the data for earlier years were reckless, which resulted from the accepted methods of statistical surveys. Although there is no comprehensive data supporting this hypothesis, it is likely to be assumed that the increase in the use of pesticides due to the progressive specialization of farms and agricultural production placing more demanding varieties and crop species. Positive development in this regard is the introduction of new standards for the use of pesticides and training for persons engaged in these efforts. This reduces the risk of contamination of the natural environment, as well as the health of consumers as a result of misuse of these funds.

6. Technical Infrastructure as Important Factor of Rural Development in Poland

Rural areas are not only a place of agricultural production and farming, but also because of favourable environmental conditions, more common place of living, which would be impossible without an efficient modern infrastructure (Dolata, 2013). The phenomena are benefiting from the changes of common agricultural policy aiming to create conditions for development of rural areas in the direction favouring the development of civilization. As a result of the support of civilization development on rural areas and construction of necessary infrastructure the accessibility of the areas outside the city increases for more people. This results in increase in property values and better management of land. This favours the rationalization of land use on rural areas and the competitiveness of agricultural production. In the past, the proper attention to the state and development of technical infrastructure was not paid. As a result, a barrier to the development of not only agricultural production but also the development of rural civilization was formed (Mosiej, 2011).

An essential condition for the effective functioning of the economy is the development of rural infrastructure, including technical infrastructure. Without roads, efficient transport, communications, water supply and energy the production is impossible on large areas. The lack of waste collection systems and sewerage systems threatens the natural environment and the functioning of rural settlement. One of the main difficulties in the development of infrastructure on rural areas is a large spatial dispersion. The total number of villages in Poland is 52.5 thousands, including 43 thousands villages and 9.5 thousands hamlets and settlements/colonies. In that number, rural villages inhabited by less than 100 people constitute 15 %, 66 % are villages inhabited by from 100 to 500 individuals, 13 % by from 500 to 1000 individuals and only 6 % of villages is inhabited by more than 1000 people. According to the data of Central Statistical Office, there is 18 200 (32 %) compact villages (with distance between farms up to 45 m), 27 % villages with dispersed housing (just above 200 m) and with intermediate distances between farms – 41 % (Wierzicki, Krajewski, 2004).

The confirmation of the rank of these problems is the identification by the World Bank of the level of equipment of the rural areas in the technical infrastructure as the primary factor of development of rural areas and agriculture, among others documented due to a direct effect on the quantitative level of agricultural production, the overall development opportunities of these areas, to attract domestic capital and investment services (Wyporska, Mosiej, 2010). The EU policy conducted from many years on infrastructure development, aims to create conditions of its availability in all EU countries, in order to diminish the civilization gap, separating rural areas from urban areas, and to create equal opportunities of competitiveness on rural areas. An equally important aspect taken into account in its policy is to prevent the depopulation of rural areas, which has an adverse impact on the sustainable development of the countries. The modern village is no longer synonymous with agriculture, but it is a different from the city place for life and work of various groups of people, that apart of diverse professions, form a community with common cultural issues, traditions, norms of coexistence and interests. Awareness and environmental sensitivity of the inhabitants of rural areas will be shaped not through orders and penalties, but foremost, by education. As long as farmers do not benefit from environmental protection, they will not be interested in maintaining clean environment.

Environmental education in Poland is generally of negative nature. It is based on providing information on activities that harm the environment and their consequences (often frightening), and does not give tips, recommendations or advices how the problems can be solved and how to do this. Neglecting this step may result in obtaining the effect, the suspension of pro-ecological activities of local communities, struggling with the problem (Wyporska, Mosiej, 2010).

Environmental protection is a complex issue especially on rural areas. Sustainable development of rural areas is the way of managing which links economic, social and ethical principles with ecological safety. This may be reached by proper management, directed on cautious usage of ecosystems self-controlling mechanisms, with the progress of science and technology. Apart from above, natural resources should be exploited without interruption of the ability to their self-renovation. Increasing production of biomass may be treated as an effect of the increase in the productiveness of the resources, which means introduction of new technologies and, at the same time, protection of resources and retaining of the high quality resources for future generations.

Rural landscape and green areas in Poland are more and more often treated as ‘carbon parks’ assimilating the carbon dioxide emitted by fuel burning. Simultaneously, traditional agriculture is gradually becoming an obsolete branch of economic activity and is being replaced by industrial methods of food production. Farmers are changing their role from food producers into environmental guardians, who oversee the functioning of the environmental sink, as well as supplying environmental amenity services to the urban public. They are also receiving a growing proportion of their income for providing services of both kinds, *e.g.* from funds in the Polish agro-environmental programme (Manteuffel Szoegge, 2013; Mosiej, 2014).

Conclusions

Evaluation of Polish agriculture sustainability is not clear. On the one hand, improved the economic situation of farmers, increasing agricultural productivity and produced by the sector value added. Through effective use of EU funds improved infrastructure in rural areas has increased the number of households connected to the water supply and sanitation, rural areas have begun to operate the company responsible for the proper management of waste. EU programs also allowed better equipped farms in machinery and equipment necessary to conduct effective production. The introduction of new technology and modern machinery has increased the efficiency of agricultural production – increased yields of both crops conducted and the efficiency of livestock production which increased the income of farmers.

However, there was a negative phenomenon. One is the aging of the rural population and rural exodus by young people. The latter phenomenon has become massive after Polish accession to the EU and the opening of the labor market in more developed countries like United Kingdom, Germany, Ireland, Norway, Sweden. It is estimated that since 2004 the Polish fixed to the EU countries left over 1.8 million people, of which a significant portion permanently. Although a large extent, this process prevents the rural unemployment, in many areas leads to the problem of consequences on farming. Despite this, the market did not develop the land, making it difficult to increase the efficiency of agricultural production. An important problem is the social stratification of rural incomes. Besides modern medium and large-area farms operate many times more social, did not lead to agricultural production and producing only for their own needs. This leads to important agricultural policy dilemmas – whether it should support the household perspective, and combat poverty and social exclusion. In the opinion of some experts, only approx. 100 thousand. farms (whose income exceeds 16 ESU) in Poland has a chance to develop and achieve parity income. In addition, 100–150 thousand. Lower income households can produce goods, but their profitability will depend on the possibility of obtaining additional income outside agriculture. But agriculture, in which instead of the usual 1.5 million farms remain only 200 000–250 000 will be agriculture sustainable?

Polish accession to the EU, Polish agriculture has brought a number of positive changes. Access to EU funds earmarked for rural development has allowed to accelerate the process of building their infrastructure to protect the environment, to implement the principles of the common agricultural policy forced on farmers

need to apply the principles of the Code of the Common Good Agricultural Practice, maintaining agricultural land in good agricultural and implement the requirements of Cross Compliance. Access to the agri – environmental and subsidies for organic farming meant that significantly increased the surface on which method of agricultural production is subordinated to the requirements of environmental protection and nature conservation.

Unfortunately, many environmental problems still remain unsolved, and the acquisition of membership in the EU has led to the emergence of new ones. For a particular threat should be regarded discussed earlier loss of agricultural land and allocating agricultural soils and forestry (including the highest class) for non-agricultural and non-forest. Threat to biodiversity is the intensification of production – both through increased consumption of fertilizers and pesticides, and by simplifying the landscape (removal of copper-field, creating large areas of monoculture crops) and crop rotation.

Therefore, the most appropriate summary to say that Polish agriculture is neither fully balanced or unbalanced excessively. The process of European integration and the introduction of the Common Agricultural Policy instruments created an opportunity that will be supported sustainable agricultural model, which will be based on a medium-sized farms, leading not overly intensive agricultural production. The construction of such a model, however, will require a considerable amount of educational activities and compliance with all of the tools used by the State in relation to agriculture to this particular purpose. Today, however, Polish politicians, there is no such determination.

Literature

- Baer-Nawrocka, A., Poczta, W. (2014). Changes in agriculture. In: I. Nurzyńska, W. Poczta (eds). *Polish village in 2014. Report on the state of the village*. Ed. FAPA. Warsaw.
- Central Statistical Office, *Statistical Yearbook: Environmental protection*. (2000, 2005, 2014). Ed. GUS Warsaw.
- Dolata, M. (2013). Infrastructure and Sustainable Rural Development – Some Theoretical Aspects. *Proceedings of the International Scientific Conference*. Rural Development.
- Eurostat. Website: <http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?sessionId=9ea7d07d30db8bad194c13fb44629ac38aa1b66697b5.e34MbxeSaxaSc40LbNiMbxeNb34Ke0?tab=table&plugin=1&pcode=tsdpc100&language=en> [20.03.2015].
- Iital, A. (2013). *Landscape and Landscape History*. In: *Rural development and land use*. Uppsala University, Baltic University Press, p. 23–38.
- Jurik, L., Húska, D., Halászová, K., Bandlerová, A. (2015). Small water reservoirs – sources of water or problems? *Journal of Ecological Engineering*, Vol. 16(4), p. 22–28.
- Karaczun, Z., Kassemberg, A., Owczarek, D. (2015). *Governance of Sustainable Development Goals (SDGs)*. National case study-Poland. Manuscript.
- Karlsson, I., Rydén, L., Sepp, K. (2013). Introduction. *Rural development and land use*. Uppsala University, Baltic University Press, p. 11–19.
- Kozyra, J., Siebielec, G. (2014). State of environment in rural areas in Poland. In: I. Nurzyńska, W. Poczta (eds). *Polish villages 2014. Report about state of villages*. FAPA, Warszawa [in Polish].
- Krasowicz, S. (2012). Problems of sustainable development in Polish agriculture in light of research of Institute of Cultivation, Fertilization and Soil Sciences. *Reports IUNG-PIB*, Vol. 29(3), p. 21–49 [in Polish].
- Manteuffel Szoegé, H. (2013). Sustainable development in rural Poland from the perspective of environmental economics. *Economic and Environmental Studies*, Vol. 13, No. 3, p. 265–278.
- Mioduszewski, W. (2006). Management of water resources in rural areas: the Polish approach. *Journal of Water and Land Development*, No. 10, p. 3–14.
- Mioduszewski, W. (2009). Water for agriculture and natural environment. *Journal of Water and Land Development*, Vol. 13b, p. 3–16.
- Mosiej, J. (2011). Rural water management as important factor of sustainable rural development in Poland – some aspects. *Rural Development 2011: Proceedings: the Fifth International Scientific Conference*, Vol. 5, Book 2, p. 326–331.
- Mosiej, J. (2014). Sustainable rural development policy in Poland – environmental aspects. *Acta Regionalia et Environmentalica*, Vol. 2, p. 65–75.
- Mosiej, J., Bus, A. (2015). New challenges in rural water management in Poland. *Proceedings of the International Scientific Conference: Rural Development 2015*. Website: <http://doi.org/10.15544/RD.2015.078>

- Ministry of Agriculture and Rural Development. (2014). MoA&RD, Programme of Rural Development for period 2014–2020 in Poland [in Polish].
- Ministry of Environment (MoE). (2013). Ministry of Environment, 2013: Strategic Plan adaptation of sensitive sectors of Polish economy for climate changes for period 2020 with perspective to 2030 (SPA 2020) [in Polish].
- Polskie ceny ziemi rolnej w pogoni za Europą. (2014). Agriculture land prices in Poland. Website: <http://www.nieruchomosci.egospodarka.pl/119092,Polskie-ceny-ziemi-rolnej-w-pogoni-za-Europa,1,80,1.html> [in Polish].
- Sepp, K. (2013). Landscape function and Ecosystem Services. *Rural development and land use*. Uppsala University, Baltic University Press, p. 39–51.
- Ustawa z dnia 3 lutego 1995 r. o ochronie gruntów rolnych i leśnych (Dz.U. 1995 Nr 16 poz. 78 z późn. zm.) [Act from 3.02.1995 about protection agriculture and forest lands] [in Polish].
- Wilkin, J. (2014). The balance of the decade of Poland's membership in the European Union in terms of agriculture and rural areas. *Rural Poland 2014, Rural Development Report*, p. 11–26.
- Wierzbicki, K., Krajewski, K. (2004). Zagrożenie konkurencyjności gospodarstw rolnych wobec niedorozwoju infrastruktury technicznej wsi polskiej. *Realizacja ustawy o kształtowaniu ustroju rolnego*. [The threat to the competitiveness of the agricultural underdevelopment of the technical infrastructure of the Polish countryside. *Implementation of the Act on development the agricultural system*] FAPA, p. 129–162 [in Polish].
- Wróbel, A., Mosiej, J., Weih, M. (2009). Land availability analysis and social attitude aspects in relation and development of short rotation forestry system in Poland. *Annals of Warsaw University of Life Sciences – SGGW, Land Reclamation*, Vol. 41 (2), p. 153–166.
- Wyporska, K., Mosiej, J. (2010). Technical infrastructure for environmental protection at the level of farms as a factor of sustainable rural development. *Economic and Environmental Studies*, Vol. 10, No. 1 (13), p. 71–84.

DARNI KAIMO KRAŠTOVAIZDŽIO PLĖTRA LENKIJOSJE: DABARTINĖS PROBLEMAS

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Santrauka

Straipsnyje aptariamos dabartinės Lenkijos kaimiškojo kraštovaizdžio plėtros perspektyvos, optimaliai išnaudojant ekonominius, ekologinius ir socialinius valdymo išteklius. Žemės ūkis yra vienas svarbiausių sektorių Lenkijoje. Tai ir viena Lenkijos ekonomiką skatinančių sričių. Akivaizdi auganti šio sektoriaus svarba tarp kitų Europos Sąjungos šalių. Kaimiškasis kraštovaizdis suprantamas ne tik kaip vieta, kur ūkininkaujama ar auginama žemės ūkio produkcija, bet ir kaip aplinkosaugos reikalavimų paisymas, įvertinant galimybes žmonėms gyventi geresnėmis sąlygomis, kuriant modernias efektyvias infrastruktūras kaimiškose vietovėse. Lenkijoje vis dar yra kaimiškų vietovių, kurios vadinamos „anglies dioksido parkais“, tai reiškia, kad čia vis dar naudojamas aplinkai kenksmingas kuras, kuriuo kūrenant į aplinką išmetama labai daug anglies dvideginio. Todėl ūkininkai skatinami keisti mąstymą ir nebenaudoti žemės ūkyje aplinką teršiančio kuro, jį keisti aplinkai saugesniu. Taigi reikėtų keisti požiūrį – nuo žemės ūkio produkcijos gamintojų į aplinkosaugos saugotojų.

PAGRINDINIAI ŽODŽIAI: *darni žemės ūkio plėtra, klimato pokyčiai, kaimiškoji kaimo infrastruktūra.*

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