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Issues related to marginal lands with reference to selected agricultural problematic areas

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Abstract

Functions of rural areas are influenced, among others, by historical conditions of social development, such as: the intensity of population growth, the insufficient level of produced crops and the permanent food shortages. Such approach to rural areas contributed to development of less useful areas, characterised by the low production potential, for agricultural purposes. Besides, those areas are also characterised by the intensive fragmentation of arable lands and directing the agricultural production to meet own demands of farmers. Professional publications include many proposals concerning definitions of marginal lands with reference to problematic areas. It mainly depends on the field of research, the authors and the approach to the discussed issues. The objective of this paper is to review the terminology and characteristics of marginal areas and problematic areas. As a result, the original definition of agricultural problematic areas will be proposed by the authors; this is important in Poland, in particular, when those issues are considered from the perspective of increasing the size of problematic areas and agricultural development in those areas.

Key words: *agricultural problematic areas, marginal lands, rural areas, spatial structure of farms*

INTRODUCTION

Conditions of the agricultural production space in Poland reflects the historical-and-legal, social-and-economic and demographic factors. At present, in Polish rural areas serious problems are created by economic factors and fragmented agriculture which will not be able to play production functions (such as generation of raw materials and products in the conditions of the strong competition) or non-production functions (such as contribution to landscape values, protection of the natural environment). Diversification of natural-and-soil conditions leads to situation when the agricultural production is performed both, in the favourable and non-favourable conditions, in low-

lands, uplands and in mountains where it is extremely difficult to run agricultural activity. In may be noticed that those are the areas which – in recent years – have been influenced by all changes and system transformations with the highest intensity. In addition, arable lands are highly fragmented, dispersion in rural areas [LEŃ 2017a, b]. Those areas are called agricultural problematic areas, depression areas, areas not useful for agriculture etc. [BAŃSKI 1999].

Basic factors which contributed to development of less useful areas (of the lower production potential) for agricultural purposes are, among others [JADCZY-SZYN 2009]:

- 1) intensive exploitation and irrational use of natural resources which intensify erosive degradation or acidification of soils;
- 2) historical conditions of social development, such as: intensity of the population growth, low crops level and permanent food shortages;
- 3) concentration of burdensome industrial production, location of waste dumps and dust emission which contribute to local pollution of arable lands;
- 4) delays in economic development in areas of limited production potential and lower incomes of inhabitants.

TERMINOLOGY DESCRIBING PROBLEMATIC AREAS

According to Article 2 item 7 of the act of 27th March, 2003 on spatial planning and development, problematic areas should be defined as: "Areas of peculiar phenomena in the field of spatial development or in relation to the occurrence of spatial conflicts, presented in a voivodeship development plan or determined in the documentation of conditions and directions of spatial development of a commune" [Ustawa... 2003].

Professional publications propose many different definitions of problematic areas. It depends on the domain of research, on the authors or different approaches to the discussed issue. Such terms as: conflict areas, areas of scarcity, depression areas, difficult areas, areas of production reserves, impaired areas, pathological areas, poorly developed areas, areas of delayed development, marginal areas etc. [BAŃSKI 1999] are used in publications dealing with the subject. Usually those terms are synonyms of the term "problematic areas" but the arbitrary use of those terms may lead to misunderstanding or errors.

The statement may be found in professional publications that problematic areas, being a part of the geographical space, are characterised by the occurrence of negative phenomena: "(...) in social, economic and technical spheres, which generate specified internal anomalies (in the spatial structure) and abnormalities of the area" [ZAGOŹDZON 1988]. The problematic area is also a unit of the geographical space, which presents "(...) some anomalies of development (...)" [WIĘCKOWICZ 1989].

This issue has been determined by [1985], for whom the problematic area is characterised by many concentrations of conflict functions in the same areas and disharmonies of development. They are reflected in the low level of living conditions, emigration of people and degradation of the natural environment [JAKOBSZE 1985].

Basing on the thesis presented by BAŃSKI [1999], problematic areas may be also defined from the perspective of complications which are generated by those areas in the country economy [BAŃSKI 1999]. On the one hand it has been assumed that the presence of such areas results in serious barriers for the social-

and-economic policy and, therefore, it is not possible to solve the problem at the regional level [SZLACHTA 1984]. The similar way of thinking was assumed by other authors pointing that – besides the, so-called, areas of depression of the high level of stagnancy (or, even regression), they specify problematic areas which require particular operations in order to solve untypical issues. That is why SECOMSKI [1982] stresses that this basically concerns the necessity to accurately check, restructure or deep renewal of areas of outdated industry or agriculture [SECOMSKI 1982]. CIOK [1991] points that the term "problematic areas" is considered as "(...) areas of low effectiveness of social-and-economic and spatial structures and, therefore, requiring special operations in the field of planning and regional policy that are required to solve existing problems" [CIOK 1991]. It is important to notice that those areas which are characterised by the relatively low development potential and which economic development requires considerable support from external resources, are also considered as rural problematic areas.

Problematic areas are also called depression areas which are characterised, first of all, by the declining economy and increasing emigration [FRIEDMANN, ALONSO 1964]. WINIARSKI [1976] uses the same terms to define those areas. In the group of areas of delayed development he also points to depression regions which are divided into two groups: areas which require structural reconversion and areas which require general reconstructions [WINIARSKI 1976].

Professional publications often use the term "neglected areas"; those areas are discussed by HORODEŃSKI [1985] as areas of the relatively lowest level of development which makes that the socially justified needs cannot be met [HORODEŃSKI 1985]. STASIAK [1985] uses the term "less developed areas" which "(...) level of social-and-economic development is lower than the average (at the continental, country or regional level)".

Another definition of problematic areas is proposed by ZAGOŹDZON [1980]. He states that: „A peripheral system in the spatial-and-functional structure of a defined unity is a part of the area characterised by the feature of peripheral areas, located outside zones of the highest economic activity" [ZAGOŹDZON 1980]. Peripheral areas are also called marginal areas [BAŃSKI 1999]. Besides, it should be noticed that the location of such areas is also an important factor concerning the discussed issues.

Agricultural scientists attempt to define problematic areas from the perspective of agriculture. Basing on FALKOWSKI [1990] agricultural problematic areas are characterised by the low agricultural effectiveness comparing to natural, historical-and-economic conditions, as well as to the level of investments in fixed and current assets of the agriculture [FALKOWSKI 1990]. However BIS [1990] considers them as areas of the low agricultural production which is difficult to be maintained: "(...) the agricultural production in par-

ticular areas depends on natural conditions, which almost “automatically” lead to underdevelopment of the entire agricultural infrastructure and culture, what results in impairment of the region” [BIS 1990]. SKAWIŃSKA [1993] says that agricultural problematic areas are: “(...) areas which play or can play the leading agricultural role due to the favourable quality of the agricultural production space and the achievable effectiveness of the agricultural production, but implementation of this function is threatened” [SKAWIŃSKA 1993]. BAŃSKI [1999] writes that this author points to the division of problematic areas into three categories: areas of production depressions (which do not utilise the possibilities generated by the natural and economic conditions), conflict areas (which are characterised by concentration of many functions limiting the development of agriculture) and marginal areas (which are characterised by unfavourable natural conditions [BAŃSKI 1999]).

Another division of problematic areas was performed by KULIKOWSKI [1992]. He distinguished two groups: depression areas “(...) which are underdeveloped comparing to surrounding areas of similar natural and economic production conditions (...)” and conflict areas “(...) characterised by concentration of many functions (such as agriculture, industry, transport etc.) and one of those functions is developed to the detriment of other functions” [KULIKOWSKI 1992].

It results from the review of professional publications that conflict areas may also be problematic areas. According to BAŃSKI [1999] spatial conflicts and classification of conflicts were mainly analysed by KOŁODZIEJSKI [1982a, b; 1987] and BAŃSKI [1999]. Following their opinions, the essence of conflicts is “(...) the fight for the access to the space, its values and resources (...)” performed by business entities operating in the space, which have different social and economic objectives [KOŁODZIEJSKI 1982a]. BAŃSKI [1999] suggests that conflicts cannot be measured and, therefore, they are subjectively discussed by many authors [BAŃSKI 1999].

According to the authors of this paper, four important definitions of problematic areas should be considered [BAŃSKI 1999]:

- the problematic area, being a part of the geographical space, which is characterised by the occurrence of negative phenomena: “(...) from the social, economic and technical spheres, which result in specified internal anomalies (in the spatial structure) and abnormalities of the area” [ZAGOŹDŻON 1988];
- the problematic area consists of those parts of a voivodeship where: “(...) problems which are particularly burdensome or difficult for solving occur” [DOMAŃSKI 1987];
- the area of the low effectiveness of social-and-economic and spatial structures, and therefore, which require special activity in the field of planning and the regional policy, required to solve the existing problems [CIOK 1991];

- a problematic area is a spatial unity, which is characterised by abnormality of one or many spatial elements [BAŃSKI 1999].

MARGINAL LANDS WITH REFERENCE TO PROBLEMATIC AREAS

Problematic areas are sometimes defined as marginal lands. It may be assumed that both definitions are similar, however the traditions of the term “marginal lands” are longer and it only partially covers with characteristic features of problematic areas.

The term of marginal soils appeared in the inter-war period in the European countries: in Germany, Austria and France, where agricultural activity was mainly based on the manpower. After the assessment of financial inputs on the manpower and material inputs it turned out that the costs exceeded the values of yields. Marginal soils were defined as soils of the lowest prolificacy which exclusion from the use does not considerably influence the reduction of profits of a farm [MICHNA, ROKICKA 1998].

In Poland the term “marginal lands” appeared in the nineties, after market transformations of the agricultural economy. Costs of labour and material costs highly exceeded the value of yields. As a result, the Agricultural Ownership Agency of the state Treasury (AWRSP – Pol. Agencja Własności Rolnej Skarbu Państwa), currently the Agricultural Property Agency (ANR – Pol. Agencja Nieruchomości Rolnej), which took over the lands of the State Farms (PGR – Pol. państwowe gospodarstwo rolne) distinguished 57 400 hectares of agriculturally inefficient lands and called them marginal lands. In 1993, after the assessment of lands being the property of the Agency it became necessary to regulate legal issues related to marginal lands. Those estimations led to conclusions concerning the exclusion of considerably parts of lands from agriculture and destination of those lands for non-agricultural purposes. That was the reason of creation of procedures and criteria of delineation of lands (soils) being the property of the AWRSP and lands which did not meet the requirements of the efficiency of cultivation in particular conditions [MICHNA 1998].

The Ministry of Agriculture and Food Economy (MRiGŻ – Pol. Ministerstwo Rolnictwa i Gospodarki Żywnościowej) and the Institute of Soil Science and Plant Cultivation (IUNG – Pol. Instytut Uprawy, Nawożenia i Gleboznawstwa) in Puławy were responsible for methods of agricultural and non-agricultural development of marginal lands. In 1992 the Department of Management of Lands and Agricultural Facilities of the Ministry determined, in more details, the issue of marginal lands and defined them as lands which were still used for agricultural purposes or remained in the register of arable lands which – due to disadvantageous natural, man-made and economic conditions are characterised by the relatively low productivity are which were not useful for production of the health food [JÓZEFACIUK *et al.* 1996]. The IUNG

developed the definition of marginal lands which says that: "Agricultural marginal lands (of arable soils and green areas) are the soils which are included in the register of arable lands which – due to disadvantageous properties and natural conditions and the land use methods are characterised by the low productivity and economic effects although correct agrotechnical operations are applied" [MICHNA 1998]. In 1993 the Ministry decided that: "In the science of economy and organisation of work in agriculture the term "marginal lands" covers such lands where the agricultural production in the existing range already is, or will be in the future, unprofitable or is becoming less profitable". The above definition was the basis for the grant "Rationalisation of marginal lands" ordered by the MRiGŻ.

Three agricultural organisations, i.e. the Institute of Soils Science and Plant Cultivation in Puławy, the Institute for Land Reclamation and Grassland Farming (IMUZ – Pol. Instytut Melioracji i Użytków Zielonych, since 2010 – Institute of Technology and Life Sciences, ITP – Pol. Instytut Technologiczno-Przyrodniczy) in Falenty and the Institute of Agricultural and Food Economics (IERiGŻ – Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej) in Warszawa were responsible for implementation of this project.

The objective of that grant was to determine criteria which might be used for determination and exclusion of soils which were characterised by the low influence on profits of farms. The authors additionally analysed the issue related to determination of the rational use of those lands in the agriculture, as well as for other purposes. The project was initiated by the Ministry of Agriculture and Food Economy which developed the set of tests for that project.

In 1966 the IUNG developed detailed guidelines concerning delineation of marginal lands from arable lands [JÓZEFACIUK *et al.* 1996]. According to approved criteria, four groups of soils are distinguished [KOTAŃSKA 1999; following: JÓZEFACIUK *et al.* 1996]:

- 1) jejune soils of green areas where the production is unprofitable due to disadvantageous natural conditions and erosion;
- 2) soils of different classes, chemically polluted as a result of business activities of people;
- 3) damaged or mechanically transformed soils, denuded of the fertile layer;
- 4) soils of disadvantageous natural-and-territorial conditions, i.e. arable lands of difficult access possibilities or difficult mechanical cultivation.

Additionally, marginal lands are divided into:

- proper – arable lands, not useful for agriculture due to the light granulometric composition, disadvantageous location, erosion or pollution;
- alternatively marginal lands – arable lands with the possibility to transfer them into green areas or with the possibilities of cultivation in the periods of particular economic situation, with consideration of ecological or weather limitations.

The basis of determination of the quality and usefulness of soils is determination of the soil classes [MICHNA 1998]. The unified classification of soils performed in the entire Poland considered physical and morphological properties of soils, being the descriptive and cartographic material in the form of classification maps presented at the scale of the cadastral map [LEŃ 2010, according to: Rozporządzenie... 1956].

Another meaning of the term "marginal lands" may be found in professional publications. It refers to the areas which were never (or almost never) used for agricultural purposes, which are not included in the register of arable lands and which are too jejune to be destined for arable fields. In 1992, at the Earth's Summit in Rio de Janeiro it was suggested not to destine such soils for agricultural purposes, since after the inclusion in arable fields, they could slightly improve the food balance. At the same time, destination of such lands for agricultural purposes, usually reduces the forest cover of continents, what negatively influences the possible environmental hazards [MICHNA 1998].

Determination of marginal lands in our country was applied until Poland accessed the European Union. Since 2004 the term "agricultural problematic areas" has been used.

CONDITIONS FOR INCREASING PROBLEMATIC AREAS IN THE WORLD AND IN POLAND

Accession of Poland to the European Union created the new situation for rural areas [SOBOLEWSKA-MIKULSKA 2009]. However, the presence of agricultural problematic areas in our country is not the precedented issue. Countries which have been the EU members for many years also met the similar difficulties at the time of integration. Examples include France, Austria and Italy, having mountain soils, which are several times less fertile than typical soils of the EU countries. However, Sweden and Finland face with the issue of the presence of northern regions, i.e. the agricultural production space characterised by short days and low temperatures.

Considering this, the following conditions of distinguishing problematic areas may be listed:

- 1) natural factors;
- 2) demographic-social-and-economic factors.

When the natural factors are discussed, it should be noticed that diversification of the agricultural production potential results from the spatial variations of the natural environment, including soil, water and climate conditions.

Poland has advantageous conditions of the terrain relief; it is mainly characterised by plains and small hills. In our country we face water and wind erosion hazards. The relatively high diversification of the natural conditions exists in Poland; as a result it is possible to diversify the structure of sowing.

Natural conditions of increasing the size of problematic areas may be, among others (Photos 1, 2):

- areas directly hazarded by floods;
- areas characterised by the high risk of flooding events;
- landslides, of diversified level of intensity;
- areas hazarded by erosion;
- areas characterised by low classes of soils and poor complexes of the agricultural usefulness.

Besides, demands for agricultural products of soils of V and VI classes is low. Therefore it is important to provide activities aiming at optimisation of the land use, in particular with reference to the poorest soils. Several directions of such optimisation may be considered:

- development, implementation of techniques and technologies of agro-technical methods of increasing the soil fertility;
- attempts to change the land use of parts of arable lands into green areas (this concerns the poorest soils, which are located in river valleys; changing the water economy in those valleys may lead to moisturising the existing arable lands that they will become green areas);
- searching for plants better adapted to cultivation, for example, on light soils.

Cultivation on poor arable lands in mountains is not justified; rich rainfalls make the use of such land highly difficult. There is a need to destine those lands, for example, for ecological fields. This concerns, in particular, several hundred thousand hectares of wetlands. It is extremely urgent to consider wetlands as agricultural ecological fields which contribute to the, so-called-ecological balance in the agriculture. Eroded, although cultivated slopes of mountains and rolling areas where the maintenance of arable lands is not justified due to the high values of slope. The only activity which may result in benefits for the agriculture is forestation of those lands [MICHNA 1998].

Social-and-economic and social-and-demographic limitations include such factors as: depopulating and ageing of villages and the absence of young successors of farmers. Areas facing with those limitations are characterised by more difficult development conditions and farms are less competitive in relation to other farms and they are determined as neglected, problematic areas or areas of delayed development.

One of the main factors which result in the decreased intensity of development of the agriculture in Poland is the economic slump of the agriculture. It leads to the reduced profitability of the agricultural production. Besides, many arable lands are being slowly absorbed by big cities which are dynamically growing. This process highly threatens agricultural and forest complexes which may be developed by investments. Additionally, reduction of profitability and lack of the possibility to modernise and technically restructure should be also mentioned.

Factors which considerably limit agricultural incomes include the fragmented agrarian structure and small size of farms. This problem concerns, in particular, the South-eastern Poland [LEŃ 2010; 2011; NOGA, LEŃ 2010], the Central Poland [WÓJCIK, LEŃ



Photo 1. Landslide, Podkarpackie voivodeship, Strzyżów district; source: Archive of the Starostwo Office in Strzyżów



Photo 2. Flooded arable lands, Małopolska voivodeship, Miechów district; source: charsznica.info [2017]



Photo 3. An example location of the recreation area, Mazovia voivodeship, Radom district, the town of Iłża (phot. J. Wójcik-Leń)

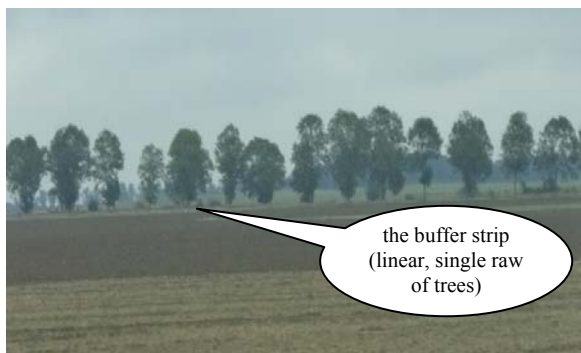


Photo 4. An example of the buffer strip, dolnośląskie voivodeship, Legnica district (phot. J. Wójcik-Leń)

2015] and the Eastern Poland [KRÓL 2014]. In the Polish conditions the high fragmentation of fields is important; it is described as the burdensome patchwork of fields. This issue was analysed in many professional publications [KRÓL, LEŃ 2016; LEŃ 2012; LEŃ *et al.* 2016; LEŃ, MIKA 2016a,b; NOGA, KRÓL 2016]. The element which usually accompanies the distributed structure of lands is the incorrect system of agricultural transport roads, including narrow and criss-crossed roads, not adapted to heavy transport and the use of agricultural machinery [RADZISZEWSKA, JAROSZEWICZ 2012].

Depopulation in rural areas has been also observed. This process, first of all, had the form of migration of young people of the mobile production age, to big urban and industrial centres. As a result the decrease of the number of births in rural areas may be observed. Exceptions include municipalities located on light soils, close to industrial centres and relatively close to large recreation and tourist centres. Municipalities of the high percentage of the poorest soils, located close to industrial and recreation centres are still being developed, similarly to municipalities located on good soils. In those municipalities (for example, in municipalities of the high percentage of soils of V and VI classes in the total area of soils in the Małopolska voivodeship). In such conditions the families of farmers leaves their farming activity on the poorest soils when they find better, non-agricultural jobs, with good salaries.

PERSPECTIVES OF DEVELOPMENT OF THE AGRICULTURE IN PROBLEMATIC AREAS

The processes of spatial diversification of rural areas, between the areas of the high and low development levels, appeared with the higher intensity in the nineties. According to BAŃSKI [1999] the strongest drop may be noticed on problematic areas. They require the particular attention paid by local governments and by the central government at all levels.

Problematic areas during their restructuring and adaptation to the EU standards are sensitive for any pathological trends. Those areas should be supported by development of forecasts and the detailed strategy of development; it should be remembered that every analysed object is unique in its structure. Attention should be paid to the areas of the lower level of development and the low quality of the agricultural production space, since they do not have any chances of development. That is why also other economic functions should be promoted in those areas, such as forest functions, cultivation of power-crops, promotion of tourism and recreation, creation of bicycle routes and routes for pedestrians, horse riding events, creation of ecological fields etc.

In the long term, the multi-functional development of agricultural problematic areas may stop or slow down the negative processes in the agriculture.

Therefore, harmonious combination of the agriculture and promotion of tourism and agro-tourism creates the great chance for rural areas (Photo 3).

Incomes from tourism may be equal or even higher than those achieved from the agricultural production. Another benefit may concern the reserves of the manpower which may be directed to submit tourist services.

The prevailing part of areas of the lower development level and the low quality of agro-ecological values are characterised by attractive conditions of the natural environment which foster the development of recreation. Destination of lands for non-agricultural and non-forest purposes may begin the development of summer houses, what will encourage inhabitants of urban areas to take advantage of this form of resting [DUDZIŃSKA *et al.* 2014].

In the areas of the degraded natural environment rational agro-technical operations should be performed which may reduce the level of contamination of the natural environment. It is important to optimise mineral fertilising and amend it with natural fertilisers. Another operation should concern the cultivation of plants and forestation of lands of the lower quality and buffer strips (Photo 4). It is good to check the knowledge of the villagers about the role of field plants in shaping the agricultural production area [DUDEL, POLAK 2016].

The following activities should be applied, among others, in ecologically threatened areas: cultivation of plants resistant to particular types of pollution, reduction of orchards in areas of higher emission of dusts, containing chemical compounds which are danger for the human health and implementation of the permanent monitoring of pollution.

The future of problematic areas, threatened by degradation will depend, first of all on planning-and-spatial decisions. At present, local governments may influence the spatial development. Rational decisions may contribute to reduction or weakening of the process of degradation of the natural environment.

Improvements of the level of agriculture in problematic areas may be mainly achieved by:

- the possibility to produce ecological food – development of organic farming [KISIEL, GRABOWSKA 2014];
- development of agritourist, as a result of advantageous natural conditions (clean environment, large areas of forests, low level of industrial and urban development, unique landscape values);
- adequate area structure of farms;
- opening the foreign markets;
- the possibilities to develop large areas for non-agricultural purposes.

PROPOSAL CONCERNING THE DEFINITION OF SELECTED AGRICULTURAL PROBLEMATIC AREAS IN POLAND

Basing on analysis of professional publications the authors determined agricultural problematic areas as lands which are still used for agricultural purposes, but which do not generate incomes due to [WÓJCIK-LEŃ 2016].

- I. Location, in relation to market and job opportunities, including:
 - the tax district,
 - the high level of unemployment,
 - the high population density,
 - the low structure of incomes;
- II. The terrain relief with consideration of:
 - locations on areas with high slope values,
 - disadvantageous directions of slopes,
 - erosion hazard,
- III. Soil conditions with respect to their quality and usefulness, with consideration of:
 - the low class of soils,
 - the poor complex of the agricultural usefulness,
 - the excessive moisture or the high dryness of soils.

According to those considerations three main and detailed criteria were proposed concerning the selection and delineation of problematic areas which were assigned adequate point weights, according to the assumed rule that the less favourable the feature value is the higher if the value of the weight [WÓJCIK-LEŃ 2016].

I. Criterion – location – 30 points:

- 1) tax district – division into tax districts;
- 2) the rate of unemployment – division into intervals (in %);
- 3) the population density – division into intervals (individuals per km²);
- 4) the structure of incomes – division into levels of incomes.

II. Criterion – terrain relief – 40 points:

- 1) slope (the terrain slope study) – division into intervals (in %);
- 2) direction of slopes – division into basic directions, in degrees, according to the wind rose;
- 3) erosion hazard – division into levels of erosion intensity.

III. Criterion – soil conditions with respect to the quality and usefulness of soils – 30 points:

- 1) soil classes – division into arable lands and green areas;
- 2) the agricultural usefulness complexes – the division of complexes was systematised according to the index of validation of the agricultural space (WRPR);
- 3) water relations – were determined on the basis of the above data with consideration of the moisture criteria with respect to soil-and-agricultural complexes.

Weights were assigned to the above criteria, according to the following formula – the synthetic index

which allows to parameterise the criterion of selected agricultural problematic areas W_{OPRn} acc. to WÓJCIK-LEŃ [2016]:

$$W_{OPRn} = \frac{\sum_1^n (k_n \cdot p_n)}{P_w} \quad (1)$$

where: W_{OPRn} = the synthetic index allowing to parameterise the criterion of the selected agricultural problematic areas; k_n = the weight of the delineated group of areas (depending on the criterion); p_n = the size of the delineated group of areas (depending on the criterion); P_w = the size of the analysed area.

CONCLUSIONS

Areas of disadvantageous natural-and-soil conditions or areas which were created by demographic-and-social and economic factors may occur in every agricultural space. Such areas, previously known as “marginal lands” and “problematic lands” at present, require significant changes and structural tools which will transform those areas in order to achieve the most effective resources of the Earth. The review of publications concerning the terminology and specification of marginal lands and problematic areas, as well as the proposal concerning the original definition of agricultural problematic areas proves that we deal with similar terms, but understood and defined in different way, depending on different domains of knowledge. Discussed conditions for increasing the size of problematic areas and perspectives of development of the agriculture proves that those issues are important for solving at many levels of administration.

Destination of marginal and problematic lands to play specific functions should determine directions of changes of their possible development. All solutions concerning the development of those areas should be directed in a way that would allow to consider social, economic and environmental aspects.

REFERENCES

- BAŃSKI J. 1999. Obszary problemowe w rolnictwie Polskim [Problematic areas in the Polish agriculture]. Prace Geograficzne. Nr 172. ISBN 83-86682-39-6 pp. 133.
- BIS K. 1990. Obszary problemowe rolnictwa ze szczególnym uwzględnieniem gleb marginalnych. W: Obszary problemowe rolnictwa Polski ze szczególnym uwzględnieniem regionu lubelskiego [Agricultural problematic areas with particular consideration of marginal soils. In: Agricultural problematic areas in Poland with particular consideration of the Lublin region]. Ed. R. Jedut. Lublin. UMCS-PTG p. 11–17.
- Charsznica.info [2017]. Podtopiona Charsznica, powódź w Małopolsce [Flood Charsznica, flood in Małopolska] [online]. [Access 28.04.2017]. Available at: <http://www.mashpedia.com/Charsznica>
- CIOK S. 1991. Sudety: obszar problemowy [The problematic area of Sudety]. Acta Universitatis Wratislaviensis. No. 1236. Studia Geograficzne. T. 51. ISBN 83-229-0489-4 pp. 87.

- DOMAŃSKI R. 1987. Przestrzenna organizacja rozwoju regionalnego [The spatial organisation of regional development]. *Studia KPZK PAN*. Nr 93. Warszawa.
- DUDEK T., POLAK A. 2016. Stan wiedzy mieszkańców wsi na temat znaczenia zadrzewień śródpolnych na przykładzie gminy Lubaczów [Awareness of rural populations regarding the importance of mid-field woodlots, an example of the Lubaczów municipality]. *Woda-Środowisko-Obszary Wiejskie*. T. 16. Z. 3(55) p. 35–46.
- DUDZIŃSKA M., JASIŃSKA E., KOCUR-BERA K., LEŃ P., PREWEDA E., SAJNÓG N., SOBOLEWSKA-MIKULSKA K., STEINSHOLT H., WALACIK M., WÓJCIK J. 2014. Directions for land management in rural areas. Zagreb. *Nationalna knjiznica*. ISBN 978-95-36129-40-9 pp. 75.
- FALKOWSKI J. 1990. Rolnicze obszary problemowe Polski (przyczyna powstania, diagnoza stanu, kierunki przekształceń). W: *Obszary problemowe rolnictwa Polski ze szczególnym uwzględnieniem regionu lubelskiego [Agricultural problematic areas of Poland (the origin, diagnosis of current conditions, directions of transformations)]*. In: *Agricultural problematic areas in Poland with particular consideration of the Lublin region*. Ed. R. Jedut. Lublin. UMCS-PTG p. 5–10.
- FRIEDMANN J., ALONSO W. 1964. Introduction. In: *Regional development and planning*. Ed. J. Friedmann, W. Alonso. Cambridge. MIT Press p. 1–13.
- HORODEŃSKI R. 1985. Problemy rozwoju obszarów zaniedbanych [Issues related to development of neglected areas]. *Nauka i Praktyka*. Nr 2 p. 29–69.
- JADCZYŹYŃ J. 2009. Regionalne zróżnicowanie obszarów problemowych rolnictwa (OPR) w Polsce [Regional diversification of agricultural problematic areas in Poland]. *Instrukcja upowszechn.* Nr 163. Puławy. IUNG-PIB Puławy pp. 80.
- JAKOBSCHKE J. 1985. Plan przestrzennego zagospodarowania kraju i planowanie makroregionalne. W: *Planowanie przestrzenne [The spatial development plan of Poland and macro-regional planning]*. In: *Spatial planning*. Ed. A. Regulski. Warszawa. PWE p. 326–363.
- JÓZEFACIUK A., JÓZEFACIUK CZ., KERN H., LEKAN SZ., STRZELEC J. 1996. Analiza dotychczasowych wyników badań z zakresu przyrodniczych uwarunkowań powstawania gruntów marginalnych oraz uzasadnienie potrzeb i celowości wydzielenia gleb marginalnych i opracowanie ich definicji [Analysis of the current results of studies on natural conditions of marginal land development and the justification of the needs and purpose of the separation of marginal soils and elaboration of their definition]. *PBZ-89-02 z. 1*. Puławy. Wydaw. IUNG.
- KISIEL R., GRABOWSKA N. 2014. Rola dopłat unijnych w rozwoju rolnictwa ekologicznego w Polsce na przykładzie województwa podlaskiego [The role of EU subsidies in the development of organic farming in Poland on the example of podlaskie voivodeship]. *Woda-Środowisko-Obszary Wiejskie*. T. 14. Z. 3(47) p. 61–73.
- KOŁODZIEJSKI J. 1982a. Realizacja celów rozwoju w warunkach narastania konfliktów w gospodarce przestrzennej. W: *Konflikty polskiej przestrzeni [Implementation of development goals in growing conflicts in the spatial development]*. In: *Conflicts of the Polish space*. *Biuletyn KPZK PAN*. Nr 120 p. 7–51.
- KOŁODZIEJSKI J. 1982b. Geneza, funkcjonowanie oraz ocena sytuacji konfliktowych w gospodarce przestrzennej Polski. W: *Diagnoza stanu gospodarki przestrzennej Polski [Genesis, operation and the assessment of conflicts in spatial development of Poland]*. In: *Diagnosis of conditions of the spatial development of Poland*. *Biuletyn KPZK PAN*. Nr 123 p. 134–148.
- KOŁODZIEJSKI J. 1987. Diagnoza stanu gospodarki przestrzennej Polski [Diagnosis of conditions of the spatial development of Poland]. *Studia KPZK PAN*. Nr 92 pp. 28.
- KOTAŃSKA K. 1999. Gleby marginalne w Polsce i ich wykorzystanie [Marginal soils and their use in Poland]. *Poznań. AR* p. 5–41.
- KRÓL Ż. 2014. Charakterystyka szachownicy gruntów o układzie wstęgowym na przykładzie miejscowości Brzeziny gmina Puchaczów [Characteristic of plots patchwork in strip type: a case study of the Brzezina village, Puchaczów commune]. *Infrastruktura i Ekologia Terenów Wiejskich*. Nr II/2 p. 423–435.
- KRÓL Ż., LEŃ P. 2016. Szachownica gruntów indywidualnych wyznacznikiem pilności wykonania prac scalenia i wymiany gruntów [Individual plot patchwork determination of the urgency in realization consolidation and exchange of land]. *Infrastruktura i Ekologia Terenów Wiejskich*. Nr II/1 p. 311–322.
- KULIKOWSKI R. 1992. Obszary problemowe rolnictwa w Polsce [Agricultural problematic areas in Poland]. In: *Wybrane zagadnienia obszarów wiejskich [Selected issues concerning rural areas]*. *Biuletyn KPZK PAN*. Nr 158 p. 23–40.
- LEŃ P. 2010. Podział przestrzeni rolniczej powiatu brzozowskiego pod względem wartości produkcyjnej gruntów ornych oraz użytków zielonych [Breakdown of county agricultural space of the Brzozów district in terms of production value of cropland and grassland]. *Infrastruktura i Ekologia Terenów Wiejskich*. Nr 12 p. 37–44.
- LEŃ P. 2011. Określenie pilności potrzeb prac scalenia i wymiany gruntów we wsiach powiatu Brzozów [Determining urgency of needs of land consolidation in villages of district Brzozów]. *Infrastruktura i Ekologia Terenów Wiejskich*. No. 3 p. 7–16.
- LEŃ P. 2012. Prawidłowości w rozmiarze występowania gruntów różniczan zamiejscowych na przykładzie wsi w powiecie Brzozów [Patterns in the size of plots belonging to out-of village owners on the example of villages in Brzozów district]. *Infrastruktura i Ekologia Terenów Wiejskich*. No. 1 p. 137–145.
- LEŃ P. 2017a. The size of the external patchwork of fields as an indicator of the need for land consolidation and exchange in the villages of the commune of Drzewica. *Journal of Water and Land Development*. No. 33 p. 99–106. DOI 10.1515/jwld-2017-0024.
- LEŃ P. 2017b. The size of an external patchwork of fields as an indicator of urgency for land consolidation and exchange on the example of the commune of Lesko. *Journal of Water and Land Development*. No. 33 p. 107–114. DOI 10.1515/jwld-2017-0025.
- LEŃ P., MIKA M. 2016a. Determination of the urgency of undertaking land consolidation works in the villages of the Sławno municipality. *Journal of Ecological Engineering*. Vol. 17. Iss. 4 p. 163–169.
- LEŃ P., MIKA M. 2016b. The impact of socio-economic factors on the size of the external plot patchwork on the example of Brzustowiec village, in the Łódzkie Voivodeship. *Geomatics and Environmental Engineering*. No. 10/2 p. 43–51.
- LEŃ P., MIKA M., WÓJCIK-LEŃ J. 2016. Estimation of the size of the external land patchwork based on test areas in podkarpackie voivodeship in Poland. *Geomatics, Landmanagement and Landscape*. No. 1 p. 65–74.

- MICHNA W. 1998. Racjonalizacja wykorzystania gleb marginalnych [Rationalisation of the use of marginal soils]. Warszawa. IERiGŻ pp. 186.
- MICHNA W., ROKICKA W. 1998. Gleby o najniższej urodzajności, ich rolnicze zastosowanie oraz ujawniająca się marginalizacja ekonomiczna [Soils of the lowest productivity, their use for agriculture and growing economic marginalisation]. Warszawa. IERiGŻ pp. 55.
- NOGA K., KRÓL Ź. 2016. The patchwork of land as a problem restricting the development of rural areas. *Barometr Regionalny*. T. 14. Nr 3 p. 155–163.
- NOGA K., LEŃ P. 2010. Analiza rozdrobnienia gruntów indywidualnych we wsiach powiatu Brzozów [Analysis of the fragmentation of private land in the villages of the district Brzozow]. *Infrastruktura i Ekologia Terenów Wiejskich*. Nr 3 p. 55–64.
- RADZISZEWSKA W., JAROSZEWICZ J. 2012. Ocena istniejącej sieci dróg transportu rolnego na obszarze wsi poddanej pracom scaleniowym [The assessment of the existing of agricultural roads in a village under the land consolidation process]. *Acta Scientiarum Polonorum Geodesia et Descriptio Terrarum*. Vol. 11. No. 3 p. 17–34.
- Rozporządzenie Rady Ministrów z dnia 4 czerwca 1956 r. w sprawie klasyfikacji gruntów [Decree of the Council of Ministers of 4 June 1956 on classification of lands]. *Dz.U.* 1956. Nr 19 poz. 97.
- SECOMSKI K. 1982. *Ekonomia regionalna* [Regional economy]. Warszawa. PWE pp. 263.
- SKAWIŃSKA E. 1993. Wstęp do badań nad rolniczymi obszarami problemowymi [Introduction to research works concerning problematic areas]. *Rozprawa*. Toruń. UMK. ISBN 8323103798 pp. 78.
- SOBOLEWSKA-MIKULSKA K. 2009. Kierunki modernizacji struktury przestrzennej obszarów wiejskich po wstąpieniu Polski do Unii Europejskiej [Directions of modernisation of the spatial infrastructure of rural areas after the Polish accession to the European Union]. *Przegląd Geodezyjny*. Nr 10 p. 11–14.
- STASIAK A. 1985. Istota i charakter obszarów słabiej rozwiniętych w Polsce w świetle dociekań nauki i praktyki [The essence and the nature of less developed areas in Poland in the light of research works and practice]. *Nauka i Praktyka*. Nr 2 p. 9–15.
- SZLACHTA J. 1984. Wschodnie tereny przygraniczne jako obszary problemowe [Eastern boundary areas as problematic areas]. *Gospodarka Planowa*. Nr 12 p. 552–559.
- Ustawa z dnia 27 marca 2003 r. o planowaniu i zagospodarowaniu przestrzennym [Act of 27 March 2003 on spatial planning and development]. *Dz.U.* 2003. Nr 80 poz. 717.
- WIĘCKOWICZ Z. 1989. Realizacja uchwały górskiej (na przykładzie województwa jeleniogórskiego) [Implementation of the mountain act (on the example of Jelenia Góra Voivodeship)]. *Wies Współczesna*. Nr 6 p. 62–70.
- WINIARSKI B. 1976. *Polityka regionalna* [The regional policy]. Warszawa. PWE pp. 13.
- WÓJCIK G., LEŃ P. 2015. Spatial development of agricultural land division throughout the ages in villages of the Opoczno County. *Geomatics and Environmental Engineering*. Vol. 9. No. 3 p. 95–107.
- WÓJCIK-LEŃ J. 2016. Koncepcja zagospodarowania wybranych obszarów problemowych w procesie scalenia gruntów [The concept of development of selected problematic areas in the land consolidation process]. PhD thesis. Warszawa. PW pp. 256.
- ZAGOŹDŻON A. 1980. Regiony peryferyjne a zagadnienie peryferyjnych układów osadniczych. Wybrane zagadnienia teoretyczne i badawcze [Peripheral regions versus the issue of peripheral settlement systems, selected theoretical and research issues]. *Przegląd Geograficzny*. Nr 52 p. 815–824.
- ZAGOŹDŻON A. 1988. Kilka uwag o obszarach problemowych. W: *Gospodarka przestrzenna, region, lokalność* [A few remarks on problem areas. In: Spatial management, region, locality]. *Biuletyn PAN KPZK*. Nr 138. Warszawa. PWN p. 137–147.

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Problematyka gruntów marginalnych w odniesieniu do wybranych obszarów problemowych rolnictwa

STRESZCZENIE

Na obszary wiejskie wpływają między innymi historyczne uwarunkowania rozwoju społeczeństwa, np.: tempo przyrostu ludności, uzyskiwanie małych plonów oraz ciągłego niedoboru żywności, które przyczyniły się do zagospodarowania na cele rolnicze również obszarów mniej przydatnych, o małym potencjale produkcyjnym. Ponadto, na tych terenach występuje znaczne rozdrobnienie gruntów rolnych i ukierunkowanie produkcji na zaspokojenie własnych potrzeb rolników. W literaturze naukowej znajduje się wiele propozycji definiowania gruntów marginalnych w odniesieniu do obszarów problemowych. Uzależnione jest to głównie od dyscypliny badawczej, autorów i sposobu podejścia do omawianego zagadnienia. Celem niniejszego artykułu jest przegląd terminologii i charakterystyka gruntów marginalnych oraz obszarów problemowych. W efekcie została zaproponowana autorska definicja obszarów problemowych rolnictwa, co w warunkach polskich wydaje się istotne zwłaszcza z perspektywy powiększania obszarów problemowych oraz rozwoju rolnictwa na tych terenach.

Słowa kluczowe: *grunty marginalne, obszary problemowe rolnictwa, obszary wiejskie, struktura przestrzenna gospodarstw*