

THE DETERMINANTS OF THE EXISTING CONDITIONS ON THE FUNCTIONAL AND SPATIAL DEVELOPMENT OF RURAL AREAS

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A b s t r a c t

The article discusses selected issues regarding the influence of ecophysiological and cultural- historical determinants on functional-spatial development of rural areas. Ecological, economic and social processes that have been past few decades are examined in the context of the development of local self-governments and the rise of free market economy after Poland's socio-economic transformation. The process of intensive rural urbanization occurs especially in areas within the impact zone of big cities. It is caused by, i.a., human migration into rural areas and development of areas of business activation. The abovementioned tendencies that occur in the ecological, economic and social context have a significant impact on functional-spatial development. Expansion of housing developments and, in effect, expansion and development of necessary technical infrastructure gives rise to many problems concerning preservation of cultural heritage of the Polish countryside. The selected issues are analysed on the basis of factors and determinants occurring in the area of Lubasz village in Wielkopolskie province. The pursuit of sustainable development of rural areas is fundamental in regard to ruralist solutions as well as preservation of traditional rural architecture. Ecophysiological and

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cultural-historical determinants play a considerable role in this pursuit, especially in the context of threats that stem from overurbanization of rural areas.

Keywords: ecophysiological, cultural-historical determinants, economic, ecological and social processes

1. INTRODUCTION

1.1. State of the research – selected issues

Transformation of rural areas in Poland after 1989 that has been taking place at different paces and on a variable scale is determined by ecological, economic and social factors. It is also, i.a., the sum of cultural-historical determinants resulting from administrative borders (mainly the borders of the partitioned Poland, as well as border-shifts after World War II). However, a considerable influence on their transformation is exerted by their location in relation to a big city. The post-war period is special in terms of migration of young people entering the job market in big cities. P. Eberhardt says in *Regiony wyludniające się w Polsce* [6] that the effects of the outflow of people from rural areas to cities, which contributed to the urbanization process, resulted in depopulation of the countryside and distortion of socio-demographic structures. Following Poland's accession to the European Union in 2004, the outflow of people from rural areas to cities transformed into economic migration outside Poland. The socio-economic development of Poland has significantly weakened this phenomenon. Villages, especially those within the impact zone of big cities, together with agglomerations and metropolitan areas, have become attractive investment areas. Rural communes, especially the ones situated in the above-mentioned zones, have experienced a reversal of depopulation. Suburbanization processes caused by ecological, economic and social factors and determinants have influenced the functional-spatial development of communes in rural metropolitan areas. The scale and pace of these processes are dictated by determinants related to specific features of local communities. M. Kłodziński [12], K. Koreleski [13], M. Adamowicz [1] who describe the phenomena highlight the multifunctional nature of rural areas as a factor ensuring their sustainable development. Rural areas, especially those that boast attractive environmental, tourist and cultural values, are currently undergoing an influx of people of non-agricultural occupations for housing reasons. The socio-economic transformation, development of information society, easy access to new technologies and job markets, the need of a change of scene and lifestyle also influence the migration processes that accompany city dwellers moving into rural areas. The functional-spatial transformations contribute to further urbanization of rural areas, and they have a vital impact on the current state of environmental-geographical and cultural-historical conditions.

Specialists claim that analyses carried out in various rural areas in Poland enable determination of specific selected model situations of cooperation in reference to sustainable development, as well as integration of migrants with local communities. The issue is discussed i.a. by J. Bański [2, 3], P. Eberhard [6], K. Heffner and B. Klemens [7], M. Kiełczewska-Zaleska [11]. Settlement networks of rural areas undergo dynamic changes. Problems of the Polish countryside were presented by J. Wiklina and I. Nurzyńska in *Polska wieś 2016. Raport o stanie wsi*. [22] The analysis of and research on the subject renders it possible to conclude that the transformation processes of the countryside that have been taking place for over three decades with variable intensity will continue into the future. In the next years, the role of the existing ecophysiological determinants will become more significant. F.N. Milkow [16], who explored the subject extensively, states that certain urbanised areas have natural complexes that are not original ecosystems, but they rather constitute components of environmental-geographical manufacturing systems dependent on and controlled by people. The dynamic and excessive sprawl compounds problems related to ecology; natural geographical environment also comes under threat. Anthropogenic components transform natural-geographical environment into anthropogenic complexes. These issues are presented i.a. by K. Heffner and B. Klemens in *Koncepcje zmian i procesy przestrzenne na obszarach wiejskich w Polsce* [7]. The authors highlight that uncontrolled functional-spatial development may cause functional-spatial conflicts. It is common but unwanted practice that provisions of studies of spatial planning conditions and directions as well as of local spatial management plans provide for an excessive number of areas designated for housing functions, business activation and for multi-purpose needs. Faulty functional-spatial decisions may cause unwanted or even detrimental effects for ecophysiological and cultural-historical environment. Negative economic effects are discussed in *Raport o ekonomicznych skutkach i społecznych kosztach niekontrolowanej urbanizacji w Polsce* by A. Kowalewski, J. Mordasewicz, J. Osiatyński, P. Śleszyński [14]. The authors point out the costs related to modernization, extension and construction of technical infrastructure, including transport networks for people and vehicles. Another problem is access to basic and secondary services. In his work titled *Pomiędzy miastem a wsią* [9], K. Kajdanek presents the issue of access to basic services within walking distance in rural areas. Paradoxically, the same standards of living in the city and in the countryside contribute to expansion of human impact in rural areas, excessive degradation of natural environment, including rural landscape. Villages are becoming home to more and more non-agricultural residents; many occupations are completely transformed also in the scope of spatial order.

New residents bring in not only culturally alien housing forms but also modify the shape of the rural landscape. Tight fencing or hedges disable migration of plants and animals; ecological corridors are broken. New functional-spatial development is carried out on an intensive complex scale. Former agricultural lands are covered by a regular grid street plan with tiny plots and gardens.

1.2. Research study – Lubasz village and ecophysiological determinants

The selected issues mentioned in the introduction are analysed on the basis of factors and determinants occurring in the area of Lubasz village in Wielkopolskie province. The study on spatial planning determinants and directions of the Lubasz commune, approved by Resolution of the Council of the Lubasz Commune no. IV/38/19 of 25 February 2019 [18], indicates an area designated for housing development, the size of which is almost as big as the already developed area in the village. In the author's opinion, excessive urbanization may pose a threat to the correct functioning of the ecophysiological and cultural-historical environment. This paper's aim is to draw attention of the local community and self-governmental authorities to selected issues of determinants and factors that exert a vital impact on the ongoing changes. Positive or negative outcome of the abovementioned processes will depend on the scale and pace of the transformations, as well as on the awareness of the inhabitants and authorities of the village of Lubasz, and their pursuit of sustainable development. These problems can be solved with the help of a local spatial development plan.

The local spatial development plan developed by the author since 2019 encounters large formal and legal problems. The scale and pace of these processes are dictated by conditions related to the specificity of local communities. H. Borucinska-Bieńkowska [5] emphasizes when describing, *inter alia*, social processes multifunctionality of rural areas as a factor conditioning their sustainable development.

2. SELECTED ECOPHYSIOGRAPHIC DETERMINANTS

2.1. Location and climate

The village of Lubasz is located in the Lubasz commune (commune area: 167.7 km²), in the north-west part of Wielkopolskie province [1]. The village located in the north-eastern part of the commune on the edge of the moraine range is its administrative centre. In 2018, Jerzy Solon, Andrzej Richling, Wiesław Ziąja et al. published in the journal *Geographia Polonica* a modified version of the division of Poland into physico-geographical regions. The new division was made in 1:50,000 detail, and the boundaries of mesoregions were determined using the latest data and their analyses in GIS systems. According to Bogumił Krygowski

[map 1], the village of Lubasz lies in the locality of Pojezierze Wielkopolskie in the region of Pradolina Toruńsko-Eberswaldzka and the subregion of Kotlina Gorzowska, as well as in the region of Wysoczyzna Gnieźnieńska and the subregion of Pagórki Czarnkowskie. [15]

The village has a varied terrain that influenced the processes related to the disappearance of glaciation. The north-east part of the village is the highest. The terrain decreases to the south and west. The majority of the village is situated within the moraine plateau.

The climate of the village is characterised by oceanic and continental influences with a large number of cloudy days and the lowest amount of rainfall in Poland. Climatic conditions are analogous to those for the above-mentioned subregion, with the average annual temperature of 7.5° C, the number of cloudy days of about 155, the average annual rainfall of 450-500 mm, and winds blowing mostly from the west and south-west.

The climate of the village is significantly affected by a large forest complex located in the south-western part of the commune, as well as park and cemetery greenery also situated in the analysed area. The forest causes, among others, night temperature drops (reduction of daily air temperature amplitudes), weakening of the strength of blowing winds, higher rainfall, and higher humidity. The proximity of the Noteć river valley, Duże lake and numerous watercourses affect the frequency and scale of fog occurrence. Ecophysiological determinants are primarily shaped by large wooded areas in the area of the village and its surroundings, flat field areas and agricultural land with average climatic conditions average for Wielkopolskie province, meadows and pastures with shallow groundwater, anthropogenic components such as urbanised areas, and arranged green areas that also affect natural environment modifying its natural ecophysiological conditions.

2.2. Geomorphology, surface shape

The shape of the terrain of the studied village was influenced both by processes related to the outflow of water from the face of the glacier and by subsequent weather and climate processes, including climate warming.

The area lowers towards the south-west, i.e. the river valleys. The highest elevated area of the village is 103.5 m above sea level; the lowest is 76.5 m above sea level. Delevelling in the village is from 5 to 27 m, and the decline in the north-eastern region is up to 20%. The village is located within the moraine plateau, which for the most part is a ground moraine. The varied terrain is primarily the result of ice sheet accumulation, erosive and accumulative water activity, outflow of water in the foreland of the ice sheet and wind activity. Such terrain has a

significant impact on the functional-spatial development of the village, determining i.a. transportation routes and forms of buildings [10].

2.3. Soil and water conditions

Soil types and classes are another important determinants for development of agricultural functions and for the shaping of spatial development of the countryside. They reflect the geomorphological and natural conditions of the studied area. The village of Lubasz has varied soils, for the most part, of classes II, IIIa and IIIb suitable for arable crops. The designated Protected Landscape Area of "Dolina Noteci" (Notec Valley) consists of arable lands, meadows and green wasteland characterised by meadow-field character.

Pursuant to the act [19], agricultural land used for agricultural purposes is under protection for the following types of soils:

- classes I-III if their compact area planned to undergo a change of use exceeds 0.5 ha,
- class IV if their compact area planned to undergo a change of use exceeds 1.0 ha,
- class IV if their compact area planned to undergo a change of use exceeds 1.0 ha,
- classes V and V if their compact area planned to undergo a change of use exceeds 1.0 ha

Agricultural lands are protected by law, which consists in i.a. limiting their conversion for non-agricultural and non-forest purposes, preventing degradation and devastation processes, restoring utility value to those agricultural lands which lost their original character, recultivation and land development for agricultural purposes, preservation of peatlands, waterholes and the existing tree clumps in fields.

Groundwater occurs at various depths, which depends on the geological structure and arrangement of the impermeable layers. Utility groundwater occurring in the commune is associated with the Quaternary and Tertiary levels of aquifers. Aquifers occur at a great depth and are covered with layers that isolate water against the penetration of dirt. The average depth of water intake is 100 m. There are several levels of groundwater in the village of Lubasz.

The village is located entirely in the basin of the Warta river. The largest lake of the commune is Duże lake, of 41.44 ha, volume about 2092.4 thousand m³, and an average depth of 5.0 m (maximum depth of 11.4 m), partly located in the north-eastern part of Lubasz. The lake has an elongated shape directed at east-west. Duże lake borders the forest in the north and agricultural land in the south. A watercourse flows out of the lake. There are no areas in the village exposed to flooding.

2.4. Flora, fauna and nature protection methods

The vegetation of the village of Lubasz is dominated by large forest complexes. They constitute a natural and unquestionable natural potential. Due to the sandy ground, the pine is the dominant species among the trees. Oaks and birches predominate among deciduous trees. Other species are represented by alder, beech and ash trees. In the forest area of Lubasz – Krucz Forest District, there are waterproofing forests. Under the Act [20], all forests are under protection consisting i.a. in limiting their use for non-forest and non-agricultural purposes, preventing degradation and devastation processes, restoring the value in use of forest land that has lost its forest character through i.a. afforestation, improving the value and condition of biodiversity, and improving their utility value.

The high value of the natural environment (protected under the act [19]) have resulted in the establishment of legally protected areas in the Lubasz commune. The largest are the "Puszcza Notecka" and "Dolina Noteci" Protected Landscape Areas. "Puszcza Notecka" covers the central and southern parts of the village. The entire area is an important element in the ecological system of international importance on a European scale, connecting the valleys of Noteć and Warta and creating an ecological corridor. There are numerous birds species, including herons, ospreys and white-tailed eagles. Natural resources and landscape values are an important value of the village, determining the scale and pace of functional-spatial development. Habitats of many plant and animal species occurring in the local meadows and pastures in the valleys of the river and watercourses create biodiversity.

The village has a 1.1 ha ecological utility land located in a mod-forest clearing at Duże lake. A 30.7 ha historic park preserved in the village, with ancient tree stands composed of oaks, poplars, ash trees and larches, is also an important element of the natural landscape. The park includes, among others, 28 trees that are protected natural monuments. The village also boasts a Catholic churchyard and a Jewish graveyard with preserved ancient trees.

3. QUALITY OF THE ENVIRONMENT – OPPORTUNITIES AND THREATS

Ecophysiological conditions, various forms of nature protection, pro-ecological awareness of local communities and local authorities significantly affect the quality of natural environment. Protected landscape areas include areas of outstanding fauna and flora, areas valuable due to biodiversity, areas forming ecological corridors of local and supra-local, national and international range. In the village of Lubasz, all elements of animate and inanimate nature should be protected, with particular emphasis on nature monuments. The diversity and

abundance of the natural environment, its good condition as well as its location and accessibility influence the development of recreational, sport and tourist functions of the area.

The functions of Lubasz include housing, services (with the majority of basic services), agricultural and forestry functions, as well as complementary recreational and sport functions. Lubasz is characterised by low investment in areas of economic activation (industrial, transport and storage), which affects the optimisation of threats arising from business activity. Threats resulting from air pollution intensify in autumn and winter and they result from the emission of pollutants from local, individual boilers used for heating the houses. However, exceedances of permitted air pollution standards have not been registered. Compact forest and park greenery promote the cleanliness of air in the village.

Provincial road no 184 runs through the village of Lubasz, which results in increased combustion emissions and noise around the road.

4. ASSESSMENT OF THE ECOPHYSIOGRAPHIC ENVIRONMENT

Lubasz has significant ecophysiological values, partially protected by law. Most of the natural and landscape values have retained their natural character. The greenery in the historic parks and cemeteries is in good condition. The area covered by the research is located within the Tertiary Main Groundwater Reservoir – the Złotów-Strzelce Krajeńskie sub-reservoir. The above-mentioned reservoir is insulated with several dozen meters of Quaternary sediments, which significantly limits the possibility of water contamination.

Surface waters of Duże lake and the river as well as the uppermost level of surface waters are most exposed to degradation. An important factor influencing the ecophysiological environment is its functional-spatial development, the growth of investment areas, development of housing construction and extension of technical infrastructure related to it. Various forms of nature protection, pro-ecological awareness of local communities and local authorities significantly affect the quality of the natural environment. Protected landscape areas include areas of outstanding fauna and flora, areas valuable due to biodiversity forming ecological corridors of local and supra-local, national and international range. In the village of Lubasz, all elements of animate and inanimate nature should be protected, with particular emphasis on nature monuments.

5. FORECAST OF CHANGES IN THE PHYSIOGRAPHIC ENVIRONMENT

Lubasz boasts a lake with a recreational centre and a camping site as well as summer houses, which i.a. are the basis for the development of recreational and tourist services in the village. Legal protection of significantly big natural areas shows the aspiration of local authorities and local communities to preserve the heritage of the ecophysiological environment. However, functional-spatial development of urbanized areas renders it necessary to strive for sustainable rural development. Attractive ecophysiological environment, well-preserved rural layouts and historical facilities and monuments provide an integrated and attractive offer for the development of recreational and sports services for both residents and tourists.

Human impact is another important factor affecting natural environment. Striving for sustainable functional-spatial development of the village will enable preservation of the natural heritage and natural environment in good condition for future generations.

6. CULTURAL-HISTORICAL DETERMINANTS

The historic ruralist layout is based on the former north-south route constituting the main historic compositional axis of the village of Lubasz. The ruralist layout has retained the trace of the former market square of the village, the complex of the Birth of Saint Mary Church with the churchyard, and the manor complex with the park. The layout is complemented by historic buildings along the local roads. The village's beautiful layout, spatially clear and well preserved, is protected by a heritage preservation programme. H. Borucinska-Bieńkowska, describing the historical layout of the village [6], emphasizes its importance in shaping the identity of the local community.

6.1 Cultural-historical determinants – selected issues

The characteristics of settlement traces in the area of the village are typical of this part of the region of Wielkopolskie province. Single artefacts and settlement traces date back to the Neolithic. [8] Remnants of a cone-shaped gord that are situated in the court park in the north-east part of the village are evidence of the early medieval settlement in the area of the present village of Lubasz. It is a burrow in the shape of a cone surrounded by a ring of wall with traces of a moss. Intensive development of the village took place in the 18th century. The palace, which used to belong to the Miaskowski family, is situated in the southern part of the 18th-century park created on the landscape-based concept, with an abundant stand of trees and numerous natural monuments. The L-shaped classicist building was

erected in the mid-18th century in place of the former 16th-century wooden manor built for the family of Wojciech Miaskowski, a provincial governor of Kalisz. The dates of the manor's (1546) and the palace's (1756) erection can be seen over the arcade supported by ten columns, as well as the date of the last redevelopment carried out by the Szułdrzyński family in 1911. The park also houses a classicist outbuilding dated back to the first half of the 19th century. Another vital historic building is a late Baroque cruciform church with two towers, erected in mid-1700s (1750-1761). Inside, the church boasts polychromies made by Wacław Tarczyński; the altar houses a painting of the Mother of God of Lubasz. The nearby churchyard is the burial place of participants of the Greater Poland Uprising, i.a. one of its leaders Włodzimierz Raczyński, and Bolesław Paszyński, a highly acclaimed forester. In the vicinity of the church there is an English Gothic bell tower – a rectangular structure from 1856.

In the area of the village of Lubasz, the conservation programme covers i.a. the 18th-century palace, the palace outbuilding dated back to the mid-1800s, the historic court park spanning an area of 30.7 ha, an archaeological site – the cone-shaped gord, and the Birth of St Mary Church with a parish house from the mid-1800s, a Catholic churchyard and a Jewish graveyard.

Among others, the railway station, a 19th-century distillery, a 1920s post office, and buildings situated at: 34 Chrobrego Street, 6 Kościelna Street, 3 Szkolna Street, 2 Szamotulska Street, 5 Stajkowskiej Street, 11 Wiejska Street, 7 Zielona Street were entered into the register of the provincial conservator of historic and cultural heritage.[24]

6.2 Quality of the cultural-historical environment – opportunities and threats

Cultural-historical environment of Lubasz village is valuable part of Greater Poland's heritage, which should be understood as urban and ruralist layouts, historic building developments, single architectural structures and buildings, industrial and technical facilities, park and garden complexes, cemeteries, and archaeological monuments. Lubasz village has historic ruralist layouts with building complexes, single buildings, and forms of designed greenery situated in the layout of historic divisions of property. The village has retained the old functional-spatial layout with two historic complexes, distinct against the background of the historic ruralist layout.

The issues of renewal, modernization, renovation and revitalization play an important role in shaping functional-spatial policy of the countryside. Plans involving preservation and restoration of the aesthetic and cultural values of the past, as well as material objects, whole building complexes and ruralist layouts were incorporated into spatial and land-use planning at the beginning of the 1990s. At the time of the country's transformation, i.e. after 1989, they played a

significant part in shaping awareness of self-governmental authorities and local communities in terms of the value of cultural and historic heritage. It should be highlighted that for the tasks mentioned above, it is also necessary to outline procedures for public communication and the framework of co-creation, as well as co-responsibility for cultural-historical programmes at the local level.

The planned and designed functional-spatial solutions should respect the current layout, and new solutions should not interfere in the structure of ruralist arrangements, buildings and other structures under legal protection. They constitute a value of cultural and historic heritage at the both regional and national levels. Historic buildings are threatened by i.a. unregulated property ownership, insufficient funds for their revitalization, restoration, refurbishment and modernization.

6.3 Assessment of the cultural-historical environment

The area of Lubasz village boasts significant cultural and historical values partially under legal protection, which promotes a relatively good state of its natural environment. Most of the landscape values have retained their natural character. The greenery in historic parks and graveyards is well maintained. Resources of tangible heritage constitute the village's great asset. Legal protection helps preserve ruralist layouts, building complexes, single buildings and structures, as well as the former functional-spatial layout, and the layout of the palace-park complex.

6.4 Forecast of changes of the cultural-historical environment

Legal protection of elements of cultural-historical environment and natural areas reflects the objective of self-governments and local communities to preserve tangible cultural heritage and natural environment. It also renders it possible to forecast further sustainable development of the countryside. Attractive natural environment, Protected Landscape Areas, well-preserved ruralist layouts and historic monuments constitute an integrated functional-spatial structure.

Human impact is a factor that affects rural environment. Sustainable functional-spatial development of the countryside will promote preservation of historic, cultural and environmental heritage in a good state for generations to come.

Functional-spatial transformation of the countryside is affected by ecological, economic and social factors and determinants. Protection of cultural-historical environment is intrinsically intertwined with environmental protection. Only correct ecological, economic and social relations can stimulate sustainable development of functional zones.

Local workshops and production-commercial facilities operating in the village do not pose a threat to the natural environment as they do not emit substances that exceed permissible standards. The problem of emission of harmful substances into the air occurs, on few occasions, in the autumn-winter season when individual households generate such emissions. The lake and the wetlands are fed by watercourses, rainfall and melting snow which carry surface pollutants, including pollutants from arable land. Functional-spatial development of Lubasz depends both on determinants of the natural environment and the cultural-historical background, as well as on economic and social determinants.

7. CONCLUSIONS:

The existing and planned functional-spatial land development of the area primarily requires:

- a) preservation of the existing areas, facilities and structures under legal protection,
- b) implementation of relevant plans for revitalization, renovation and modernization for the areas, facilities and objects of ecophysiological, historical and cultural importance
- c) equipment of all investment areas, facilities and objects with relevant pro-ecological technical infrastructure
- d) implementation of pro-ecological low-emission heating energy sources for all users,
- e) restrictions on designation of new business activity areas and production-commercial facilities in the areas of historic buildings under legal protection
- f) ensuring correct natural resource management,
- g) ensuring correct pro-ecological waste management with special regard to waste generated by business activities
- h) land remediation of all areas that require remediation.

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