ISSN 1899-3192
e-ISSN 2392-0041

PRACE NAUKOWE
Uniwersytetu Ekonomicznego we Wrocławiu

RESEARCH PAPERS
of Wrocław University of Economics

Nr 418

Gospodarka przestrzenna

Aktualne aspekty polityki społeczno-gospodarczej i przestrzennej

Contemporary Problems of Socio-economic and Spatial Policy

Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu

PRACE NAUKOWE UE NR 418
Gospodarka przestrzenna. Aktualne aspekty polityki...

Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu
www.pracenaukowe.ue.wroc.pl

Czasopismo jest indeksowane w następujących bazach:

- BazEkon www.kangur.uek.krakow.pl/bazy_ae/bazekon/nowy/index.php
- CEEOL www.ceeol.com
- EBSCO www.ebscohost.com

Wolny dostęp do wersji elektronicznej:

- www.pracenaukowe.ue.wroc.pl
- Centrum Otwartej Nauki www.bibliotekanauki.ceon.pl
- Dolnośląska Biblioteka Cyfrowa www.dbc.wroc.pl
- www.ibuk.pl
- www.ksiegarnia.ue.wroc.pl

Adres Redakcji
Wydawnictwo Uniwersytetu Ekonomicznego
we Wrocławiu
53-345 Wrocław, ul. Komandorska 118/120

ISBN 978-83-7695-563-6

Gospodarka przestrzenna. Aktualne aspekty polityki społeczno-gospodarczej i przestrzennej

PRACE NAUKOWE
Uniwersytetu Ekonomicznego we Wrocławiu

RESEARCH PAPERS
of Wrocław University of Economics

Nr 418

Gospodarka przestrzenna. Aktualne aspekty polityki społeczno-gospodarczej i przestrzennej

Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu
Wrocław 2016

Redakcja wydawnicza: Barbara Majewska
Redakcja techniczna: Barbara Łopusiewicz
Korekta: Justyna Mroczkowska
Łamanie: Małgorzata Czupryńska
Projekt okładki: Beata Dębska

Informacje o naborze artykułów i zasadach recenzowania
znajdują się na stronach internetowych
www.pracenaukowe.ue.wroc.pl
www.wydawnictwo.ue.wroc.pl

ISSN 1899-3192
e-ISSN 2392-0041

ISBN 978-83-7695-563-6

Wersja pierwotna: publikacja drukowana

Zamówienia na opublikowane prace należy składać na adres:
Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu
ul. Komandorska 118/120, 53-345 Wrocław
tel./fax 71 36 80 602; e-mail:econbook@ue.wroc.pl
www.ksiegarnia.ue.wroc.pl

Druk i oprawa: TOTEM

Spis treści

PRACE NAUKOWE UNIWERSYTETU EKONOMICZNEGO WE WROCŁAWIU
RESEARCH PAPERS OF WROCŁAW UNIVERSITY OF ECONOMICS nr 418 • 2016

Gospodarka przestrzenna. ISSN 1899-3192
Aktualne aspekty polityki społeczno-gospodarczej i przestrzennej e-ISSN 2392-0041

Marcin Feltynowski
University of Lodz, Faculty of Economics and Sociology
e-mail: marcin.feltynowski@uni.lodz.pl

UNSUSTAINABLE SPATIAL PLANNING – THE EXAMPLE OF COMMUNITIES OF THE CENTRAL REGION

NIEZRÓWNOWAŻONE PLANOWANIE PRZESTRZENNE – PRZYKŁAD GMIN REGIONU CENTRALNEGO

DOI: 10.15611/pn.2016.418.05
JEL Classification: R52, Q01, R58.

Summary: Sustainable development is an overriding principle of spatial planning. The article addresses the issue of sustainable spatial planning putting forward a hypothesis that the majority of gminas do not follow the paradigm of sustainable development. The purpose of the article is to indicate a method that allows to estimate demographic capacity on the basis of spatial data. A consequence of the capacity assessment is the possibility to demonstrate, which of the surveyed gminas in the central region allot too much space for housing development. For the credibility of the research, gminas that are fully covered with land-use plans have been included in the analysis. The most significant conclusion that results from the research is the fact that in the research group there is no connection between the demographic situation and the assumptions regarding housing development in land-use plans. The majority of local governments prepare these documents in isolation from statistical and spatial data, which results in situations where the implementation of the plans' guidelines leads to an increase in the population number up to thirtyfold. This kind of practices harm the inner and inter generation justice and lead to an excessive anthropogenic impact on the space surrounding a human being.

Keywords: land-use plan, sustainable development, demographic capacity indicator, evidence based urban planning.

Streszczenie: Zrównoważony rozwój jest nadrzędną zasadą planowania przestrzennego. Artykuł podejmuje problematykę zrównoważonego planowania przestrzennego, stawiając hipotezę, że większość gmin nie kieruje się paradygmatem zrównoważonego rozwoju. Celem artykułu jest wskazanie metody pozwalającej na ocenę chłonności demograficznej na podstawie danych przestrzennych i wykorzystanie jej jako elementu w planowaniu przestrzennym opartym na dowodach. Konsekwencją oceny chłonności jest możliwość wykazania, które z badanych gmin w regionie centralnym przeznaczają zbyt dużo przestrzeni pod zabudowę mieszkaniową. Dla wiarygodności prowadzonych badań analizą objęte zostały gminy posia-

dające pełne pokrycie planami miejscowymi. Najważniejszym wnioskiem płynącym z badania jest fakt, że w grupie badawczej brak jest powiązania sytuacji demograficznej z założeniami dotyczącymi zabudowy mieszkaniowej w planach miejscowych. Większość samorządów redaguje bowiem te dokumenty w oderwaniu od danych statycznych oraz przestrzennych, przez co dochodzi do sytuacji, w której realizacja założeń planów prowadzi do zwiększenia liczby ludności nawet 30-krotnie. Tego rodzaju praktyki godzą w sprawiedliwość wewnątrzpokoleniową i międzypokoleniową oraz prowadzą do nadmiernej antropopresji na otaczającą człowieka przestrzeń.

Słowa kluczowe: miejscowy plan zagospodarowania przestrzennego, zrównoważony rozwój, wskaźnik chłonności demograficznej, planowanie przestrzenne oparte na dowodach.

1. Introduction

Sustainable development is based on the assumptions established in the nineties of the twentieth century. It should be indicated that these assumptions are still relevant and have been implemented to different sectoral policies of local governments. One of the main component policies carried out by local authorities is spatial policy which constitutes a kind of bridge between other sectoral policies carried out in a community, since that is the spatial sphere, where mutual interaction between the other functioning spheres of a territorial unit occurs. Acknowledging sustainable development as a fundamental concept that allows for progress in accordance with environment results from the fact that the model of social, environmental and economic development, which was preferred until the end of the twentieth century, generated results that were harmful for the environment and did not allow to use it by future generations. There was a fear that an excessive exploitation of environment and improperly carried out component policies could lead to negative economic results.

Although sustainable development is visible in many economic fields, it was the ecological economics that assigned to it a special role in socio-economic development [Rogall 2010]. It should be noted that sustainable development economics is a development of ecological economics [Rogall 2010; Midor 2012]. In sustainable development economics, as a basis should be considered the activities focused on retaining the surrounding environment in a condition that would allow it to be used by future generations. The Spatial Planning and Development Act of 2003 also cites these issues [Ustawa z dnia 27 marca 2003 r.…], which refers to the definition contained in the Environmental Protection Act of 2001 [Ustawa z dnia 27 kwietnia 2001 r.…].

Sustainable development economics refers to the use of natural resources, with a particular attention to the issues of their depletion, which stands in opposition to traditional economics. Moreover, it should be noted that one of the resources is the Earth, however, with reference to spatial economy, this term should be substituted with the expression *space*. Space as a limited good has to be used in a thoughtful way. It should be noticed that there is a relation of this feature of space with the theory of

games, that is the zero-sum game, since the indication of the destination of space in a land-use plan makes it impossible to use it for other purposes [Wańkowicz 2012]. According to local authorities, there is a simple correlation of the use of space for building areas, since economic aspects, which omit sustainable development issues, allow to indicate that building-up areas are a potentially better source of income for local authorities than they are in case of agricultural or forest destination. Such assumptions of local authorities often lead to incautious decisions connected with allotting new lands for development. It is associated with the necessity of providing the areas with utilities in future, which can become an element that burdens gmina's budget. In this respect it should be acknowledged that in most cases the authorities of Polish gminas act contrary to sustainable development principle.

Apart from sustainable development economy, local authorities can be supported by the evidence based on urban planning. The evidence based idea stems from medicine and has been developed since the beginning of the nineties [Li-Wan-Po 1998]. Further stages of the development of this concept prove that apart from medical area it is implemented to other spheres connected with public life, both on a national and local level. It should be noted that regardless of the methods used (quality and quantity ones), the analyses have to be carried out on the basis of credible data and with cooperation of the scientific world and local governments that will use the research results [Head 2009].

Research and carrying out analyses are particularly important in the spatial planning process which does not have a time horizon, and thus the decisions made by local authorities can expose a gmina and local actors to negative effects for many years. Using even simple analyses based on facts can contribute to the implementation of sustainable development principle, which is a premise coming from sustainable development economics. Regardless of this, there is a transfer of knowledge between the entities carrying out analyses and governmental units using their results.

2. Materials used for spatial planning in gminas

Present spatial planning was legitimised in 2003 by the Spatial Planning and Development Act [Act of 27 March 2003]. According to its records, the instruments that serve shaping spatial development in a gmina are: a study of conditions and directions of spatial development, land-use plans and planning permissions. Regulations introduced by the Act of 2003 have not interfered significantly in the state's spatial planning system valid since 1995.

According to the records of the Act, the basic act of spatial planning that influences directly local society is a land-use plan, which has to be unanimous with the records of the study of conditions and directions of spatial planning of a gmina. In case of both documents, in the procedure of their compilation, knowledge of the real state of spatial development and socio-economic situation is necessary. At

the beginning of both procedures, local authorities should become acquainted with population forecasts for a local unit, which can be obtained from Internet websites of the Central Statistical Office (CSO) [BPPK, 1983]. This concerns also the other spheres connected with the activities of a local government unit.

Local authorities can also use special compilations that help to estimate the values of demographic capacity indicator, which expresses the number of inhabitants that can settle on a specific area taking into consideration building density [Kowalewski et al. 2014]. Due to their use, it can be estimated what the number of the area should be allotted for investments connected with the housing industry that is: multi-family housing, single-family housing, homestead housing. Such an approach is one of the elements that influences the prevention of further development of buildings, and thus lowers future costs allocated for infrastructural investments and service of the inhabitants of gminas connected with the access to public services [Kowalewski et al. 2014].

Spatial data and satellite images, which with the use of appropriate techniques, allow to estimate the type of a present use of the area can be new tools used for planning works. They also serve monitoring purposes for changes happening in space of a gmina. These are the present satellite images that are the basis for activities connected with spatial planning. Due to them, effective and efficient inventory of a gmina's areas, in the scope of the present use of the local government areas, is possible [Schneider 2012; Horvat 2013; Feltynowski 2015]. In the planning practice of our country, this kind of analyses are often omitted. However, it should be highlighted that an increasingly broader market connected with satellite images results in the decrease of costs of acquiring them, which should make local authorities use this element in planning activities, in particular in order to carry out a full inventory of the areas for which land-use plans, and in future the assessment of the implementation of the guidelines of land-use plans, are being prepared.

3. Methodology and research area

The basic criterion for choosing the research area was the availability of land cover data, therefore the analysis included the central region that is Łódzkie and Mazowieckie Voivodeships. It was a collection of 491 gminas. The next step in the identification of the research area was the identification of gminas that at the end of 2013 had land-use plans for the entire surface area within the administrative borders. For this purpose, data gathered in the CSO Local Data Base was used. This allowed to narrow the research area to 65 gminas, out of which 27 were located within Łódzkie Voivodeship, and 38 in Mazowieckie Voivodeship. The last stage of selection was verifying if the indicated 65 gminas filling in the survey "Spatial planning in gminas" for the Ministry of Infrastructure and Development supplemented the information how the use of space for different types of land use was spread out. The consequence of this verification was the reduction of the research group to 61 gminas, since in

case of one gmina from Mazowieckie Voivodeship and two gminas from Łodzkie Voivodeship, in the data base there was no indicated the percentage of the area for individual use. Additionally, in one of the gminas of Łódzkie Voivodeship, the data did not sum up to 100%. The consequence of the carried out verification was the fact that eventually there were 24 gminas from Łódzkie Voivodeship and 37 gminas from Mazowieckie Voivodeship included in the research (Fig. 1.).

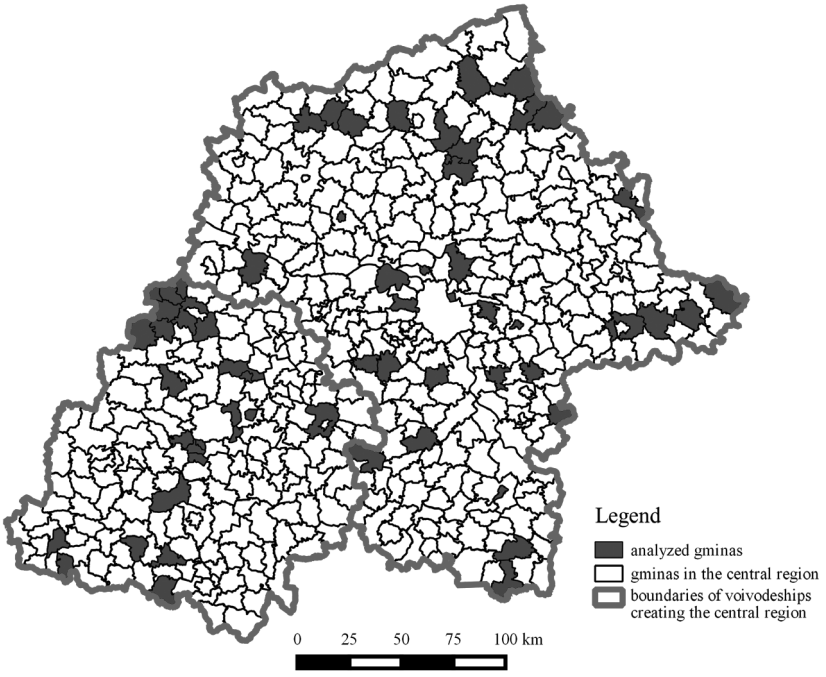

Fig. 1. Gminas participating in the research

Source: own work based on maps from Central Geodetic and Cartographic Documentation Centre.

The deliberate choice resulted from the possibility of use spatial data at this stage from the European Environmental Agency (EEA) connected with land cover. Spatial data came from two sources: CORINE Land Cover 2006 compilation (CLC2006) and Urban Atlas collection. In CLC2006 database there is information concerning the areas of a minimal surface of 25 ha and the width of at least 100 meters. Data essential for the compilation came from satellite images supplied by Landsat, SPOT and IRS satellites. The compilation for the area of Poland was fully completed in October 2008. With reference to the cities with over 100 thousands of inhabitants and areas surrounding them, it was possible to use Urban Atlas compilations completed in 2010. In case of this data, the accuracy in chosen areas is even hundredfold higher than in case of CLC2006. According to the EEA instruction, a minimal

surface of the research area is 0.25 or 1 ha depending on the anthropogenic impact on a given area. The accuracy of the classification in case of urban areas amounts to 85%, and with reference to other areas it reaches 80%. In case of both compilations, in the analyses, only the areas classified as housing areas, regardless of the designated housing density, were used.

Data concerning housing areas allowed to define demographic capacity present in urban gminas excluding district towns, rural gminas and urban-rural gminas. Those analyses were possible due to the use of QuantumGIS version 2.8.2, which allowed to calculate the total surface of housing areas in individual gminas, and in consequence the average demographic capacity on the basis of CSO data concerning the population number according to the real place of residence at the end of 2010. The application of population data from 2010 resulted from the completion date of the last compilation concerning land cover. The obtained results became the basis to calculate the expected population number in the analysed gminas, assuming full implementation of land-use plans. For comparison, estimates concerning demographic capacity for three types of buildings were also used, including: multi-family housing (200 persons/ha), single-family housing (40 persons/ha) and homestead housing (10 persons/ha). These estimates came from expert compilations connected with the research subject [Kowalewski et al. 2014]. Additionally, in further stages of the analyses, population data from 1995-2014 were used in order to estimate the directions of changes in population number in the surveyed gminas.

4. Research results

Research carried out in chosen gminas of the central region allowed to estimate the average value of demographic capacity for gminas depending on their types. This was possible due to the use of data concerning land cover for this area. Demographic capacity indicator for urban gminas amounted to 53 persons/ha, for rural gminas 22 persons/ha, and for urban-rural gminas 26 persons/ha. Additionally, the indicator for district towns was estimated and it amounted to 110 persons/ha. Due to such calculated demographic capacity indicators, it was possible to indicate the expected population number in case of a full implementation of the assumptions concerning housing areas comprised in land-use plans.

Obtained results allow to indicate that in case of two gminas: Legionowo and Pionki, the population number was underestimated. In other local governments, the introduction of new housing areas to land-use plans contributes to an increase in population number. The expected number of population in other gminas showed that after the implementation of the assumptions of a land-use plan, the population number would amount to between 109 and nearly 7700 percent of the number of inhabitants recorded at the end of 2014. In case of gminas of a higher indicator, it seems to be unimaginable with reference to the population forecasts presented by CSO.

In case of five of the surveyed gminas, it has been claimed that local authorities approving land-use plans, with estimated for the research aims demographic capacity indicators, enabled the potential growth of the population number to 120% noted in 2014. Those units were: Mińsk Mazowiecki (population growth to 109%), Andrespol (110%), Ząbki (112%), urban gmina Pabianice (113%) and Parysów (117%). It has to be highlighted that in case of Andrespol, Pabianice and Ząbki gminas, these are units that border directly with district towns.

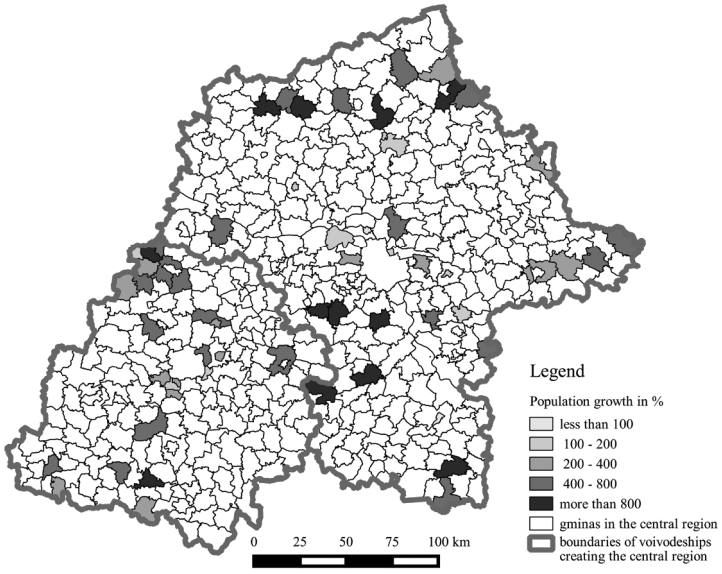

Fig. 2. Population growth based on land-use plan guidelines

Source: own work based on maps from Central Geodetic and Cartographic Documentation Centre.

Further five gminas noted population growth in a gmina to the level from 143 to 196%, which suggests an even twofold population growth. In other cases, the population growth in gminas exceeds the doubling of the current population number. In extreme cases, the indicator exceeds 30 times the present inhabitant number in a gmina. Such a situation was identified in case of Nowe Miasto nad Pilicą (urban-rural gmina) and three rural gminas: Płoniaw-Bramury, Ciepielowa and Czerwonki. All these gminas are located in Mazowieckie Voivodeship and the forecasted population number is to exceed in all cases 200 thousand inhabitants.

In order to confirm the thesis concerning the lack of the rule of sustainable development in spatial planning of gminas, it should be indicated that among the surveyed units nearly 69% were characterized with the negative balance of the population number in the last 20 years. In other 31% of cases, population growths

were noted. Among the gminas, where the population number increased, the highest value of the indicator was noted in Ząbki, where the population number increased by 107% in comparison with the value noted in 1995. The lowest growth over the years (0,9%) was noted in Wiśniewo gmina. With reference to gminas characterized by the loss in population over 20 years, it should be indicated that the lowest population number loss was noted in Płońsk (1.4% of population), and the highest in a rural gmina Pabianice (42.5%). Significant information resulting from the research is the fact that the real population number growth did not correlate in any way with the expected inhabitant number according to the calculations on the basis of the demographic capacity indicator.

Analysing the same phenomenon, taking into consideration demographic capacity indicators for a particular type of housing area, it has to be stated that in every gmina the growth in population number has been noted. In nearly 84% of cases, the growth was higher than the forecast resulting from the indicators calculated on the basis of data coming from EEA.

5. Conclusions

Carried out analyses indicated that local authorities, when working out land-use plans, do not take into account basic data that can become a basis for accurate decisions in the scope of spatial planning. This also concerns data referring to population number, which is an essential element in the spatial planning process. Additionally, this kind of activities is supported by the necessity of carrying out sustainable development policy on a local level, which should limit the expansion of cities and urbanized areas to new places [Uchwała Nr 239…].

The policy carried out by local authorities seems to go in accordance with the assumptions of the neoclassical environmental economics, where homo oeconomicus acts in order to gain the biggest profits for themselves and limits this behaviour to time horizon of their presence in local authorities. This diverges from the assumptions of sustainable development economics, which as a superior purpose considers the inner and inter generation justice and indicates that economic benefits cannot be achieved at a cost of environment. This is confirmed by the analyses results, suggesting the excessive population number growth in gminas and an increased anthropogenic impact on the surrounding space.

In case of unjustified decisions concerning spatial planning that result in transformations of the way of spatial development, there is a lack of factual premises for such spatial policy in gminas. This results from the lack of consideration of costs that in case of a full implementation of land-use plans should pay a gmina regarding the accomplishment of local roads, waterworks and sewage system. A solution to such a situation could be the restriction of the number of areas allotted for housing areas on the basis of basic spatial and statistical data. Such an approach would allow for an increase in rationality in the scope of space management and would allow to

lower the costs of local government units, in accordance with the assumptions of sustainable development economics and rules acknowledged as an interpretation of Polish spatial planning system.

Carried out analyses are based on the calculations of average indicators for a set of surveyed gminas. In the planning process, using the same tools and the same spatial and statistical data, local authorities can use individual demographic capacity indicators. This will allow for rational space management and implementation of the spatial planning principle including the most significant principle of sustainable development.

References

Biuro Planowania Przestrzennego Katowice (BPPK), 1983, *Materiały wejściowe*, BPP – Zakład Reprodukcji, Katowice.

Feltynowski M., 2015, *Spatial information systems – a tool supporting good governance in spatial planning processes of green areas*, Journal of Urban and Regional Analysis, Volume 7, Issue 1, p. 69-82.

Head B., 2009, *Evidence-based policy: principles and requirements*, [in:] *Strengthening Evidence-based Policy in the Australian Federation*, Volume 1, Australian Government, Canberra, pp. 13-26.

Horvat Z., 2013, *Using Landsat Satellite Imagery to Determine Land Use/Land Cover Changes in Medimurje County, Croatia*, Hrvatski Geografski Glasnik 75/2, pp. 5-28.

Kowalewski A., Mordasewicz J., Osiatyński J., Regulski J., Stępień J., Śleszyński P., 2014, *Ekonomiczne straty i społeczne koszty niekontrolowanej urbanizacji w Polsce – wybrane fragmenty raportu*, Samorząd Terytorialny, Nr 4(280), pp. 5-21.

Li-Wan-Po A., 1998, *Dictionary of Evidence-based Medicine*, Radcliffe Medical Press, Abingdon.

Midor K., 2012*, Ekonomia zrównoważonego rozwoju alternatywą dla współczesnej gospodarki światowej,* Systemy Wspomagania w Inżynierii Produkcji, nr 2, pp. 59-68.

Rogall H., 2010, *Ekonomia zrównoważonego rozwoju. Teoria i praktyka,* Wydawnictwo Zysk i S-ka, Poznań.

Schneider A., 2012, *Monitoring land cover change in urban and peri-urban areas using dense time stacks of Landsat satellite data and a data mining approach*, Remote Sensing of Environment 124, pp. 689-704.

Uchwała Nr 239 Rady Ministrów z dnia 13 grudnia 2011 r. w sprawie przyjęcia Koncepcji Przestrzennego Zagospodarowania Kraju 2030, M.P. 2012, poz. 252.

Ustawa z dnia 27 kwietnia 2001 r. – Prawo ochrony środowiska, Dz.U. 2001, nr 62, poz. 627 ze zm.

Ustawa z dnia 27 marca 2003 r. o planowaniu i zagospodarowaniu przestrzennym, Dz.U. 2003, nr 80, poz. 717 ze zm.

Wańkowicz W., 2012, *Krajobraz – wykorzystanie czy ochrona versus wykorzystanie i ochrona. Planowanie przestrzeni o wysokich walorach krajobrazowych*, Teka Komisji Architektury, Urbanistyki i Studiów Krajobrazowych, VIII/2, pp. 136-146.