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# Settlement Networks in Polish Spatial Development Regional Plans

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**Abstract.** In 1999, ten years after the great political changes in Poland, 16 self-governed regions (in Polish: voivodeship) were created. According to Polish law, voivodeship spatial development plans, or regional plans in short, determine basic elements of the settlement network. No detailed regulations indicate the specific elements of the settlement network or what features of these elements should be determined. For this reason, centres as elements of the settlement network are variously named in different regions and take the form of various models. The purposes of the research described in this article are: (1) recognition and systematization of settlement network models determined in regional plans; and (2) assessment of the readability of determination in planning and its usefulness in the practice of regional policy. Six models of settlement networks in regional plans have been identified and classified into types and sub-types. Names of specific levels of centres indicate that they were classified according to two criteria: (1) level of services, which concerns only 5 voivodships; and (2) importance in development, which concerns the 11 other voivodships. The hierarchical model referring to the importance of development is less understandable than the one related to services. In the text of most plans, centres of services and centres of development are treated independently from their names. In some plans the functional types of towns and cities are indicated. In some voivodships, specifications in the plan text are too general and seem to be rather useless in the practice of regional policy. The author suggests that regional plans should determine two kinds of centres: hierarchical service centres and non-hierarchical centres of development. These centres should be further distinguished according to: (1) their role in the activation of surroundings; (2) their level of development and the necessity of action for their development; and (3) the types of actions indicated in the regional policy.

## 1. Introduction

The tradition of regional planning in Poland dates back to the time before the Second World War. In 1938, the process of regional planning covered half of Poland's territory. The Central Industrial District was the greatest effect of regional planning. After 1945, regional plans were prepared for 14, and then 17 regions (in Polish: voivodships). After 1956, the voivodships cooperated with economic planning in parallel with national spatial planning [1]. However, the influence of regional plans on reality was quite small. Admittedly, all the economy was based not on the real market, but on plans – mainly on medium and short-term socio-economic plans (often changing) that had played a dominant role. The period was marked by the disadvantages of a socialist system: centralism and the lack of self-government, which resulted in most decisions being made by the communist party.



The changing of administrative divisions in 1975 was very important for regional planning. In effect, 49 small voivodeships were created in place of the 17 voivodeships and poviats (Polish territorial division similar to counties). Spatial plans for these voivodeships were not treated as regional, but as local. Regional planning existed for 8 macro-regions (which involved only planning, without administrative areas) as an auxiliary tool for the national level of socio-economic and spatial planning.

After the great political changes in 1989, the process of decentralization started. In 1990, territorial self-government was established only at the basic, lowest level of gmina (Polish territorial division similar to commune). In 1999, two higher levels of self-governed entities were created: 315 poviats and 16 large voivodeships, instead of the previous 49 small voivodeships. This change had created circumstances for the renaissance of regional planning.

According to Polish law, spatial development plans for voivodeships (SDPV) are regional plans that determine basic elements (among many other elements) of the settlement network [2]. There are no detailed regulations indicating the specific elements of the network, or what features of these elements should be determined. Although regional plans should take into account the decisions of the National Spatial Development Concept 2030 (NSDC 2030) [3] among others concerning the settlement network, most regional plans were prepared before resolution of the NSDC. As a result, centres as elements of the settlement network are variously named in different regions and create various models of the settlement network.

A large part of the literature from the scope of spatial economy concerns hierarchical settlement network models [4, 5, 6, 7]. Settlement networks and their hierarchy were often studied as growth centres – with a concentration of the population, jobs, and economic activities [8, 9]. In Poland, research on the settlement network has concerned sub-regional centres in the framework based on NSDC 2030 [10] and regional centres identified in NSDC 2030 [11]. Kwiatek-Sołtys & Runge [12] and Sokołowski [13] investigated medium-sized towns, classifying them according to indicators of nodality and centrality. Runge [14] recognized the number of researches concerning medium-sized towns as being too low, according to the role these towns play in the national settlement system. Settlement networks of voivodeships have been studied among others in connection with the work undertaken on regional strategies [15] and SDPV. Delimitations of the areas serviced by the sub-regional centres were examined by gravity and potential method in Malopolskie [16] and Pomeranian Voivodeships [17]. Suchta, Drońska & Celmer [18] researched the role of big and medium-size cities in the regional development process. As we can see, the settlement network at the regional level was researched in Poland mainly as reality, but not as a subject of the regional plans. Some problems concerning the readability of a settlement network in regional plans was noticed by the author while examining sub-regional service centres [19]. The author intends to deepen examination of the issue of settlement network in regional plans.

The **purposes** of the research described in this article include the following:

1. Recognition of and systematization of settlement network models determined in the regional plans (by number of levels and criteria of their classification);
2. Assessment of the readability of determination in planning and its usefulness in the practice of regional policy.

Capitals of voivodeships and settlement entities in metropolitan areas have been excluded from the subject of analysis (except for Tczew and Wejherowo in Pomorskie Voivodeship – located on the edge of the metropolitan area and serving large parts of the region beyond this area).

**Methods** of the research included mainly the analysis of spatial development plans for voivodeships. This analysis included two parts: (1) identification of settlement network models used in regional plans and classification of these models; comparison of both the number of levels of centres and the population of centres as tools for the classification; and (2) analysis of the text of plans.

## 2. Settlement network models

Settlement networks differ in various regional plans (SDPV). The numbers of levels (ranging from 2 - 5) and the names of centres vary (see Table 1 and 2). For this reason, variants of the settlement network can be classified into types. Names of the rank of centres indicate that the centres are classified according to two criteria: 1) Level of services, and 2) Importance in development.

If the centres are classified as sub-regional, we can suppose that these are service centres in which sub-regional services are concentrated, despite the fact that no centre is named as a service centre. Under the Polish administration system these services may be located in several towns within a voivodeship, but not in every poviát capital [19]. If centres apart from the capital of voivodeship are named supra-regional or regional, it means that they cannot be service centres, because in the voivodeship (treated as a region) there can only be one regional service centre – the capital of the voivodeship. In these cases, we can suppose that centres are classified according to their importance in development and / or role in the spatial structure of the voivodeship.

In many plans, especially at the poviát level and lower, ranks of centres are defined variously as supra-local, local or supra-commune (Table 2). Taking all the differences into account would result in 13 variants of the settlement network. For this reason, the subject of the classification were models of the settlement network only above the poviát rank.

**Table 1.** Classifications of the settlement network in spatial development plans of voivodeships according to number of levels above poviát (county) rank and the system of names of centres

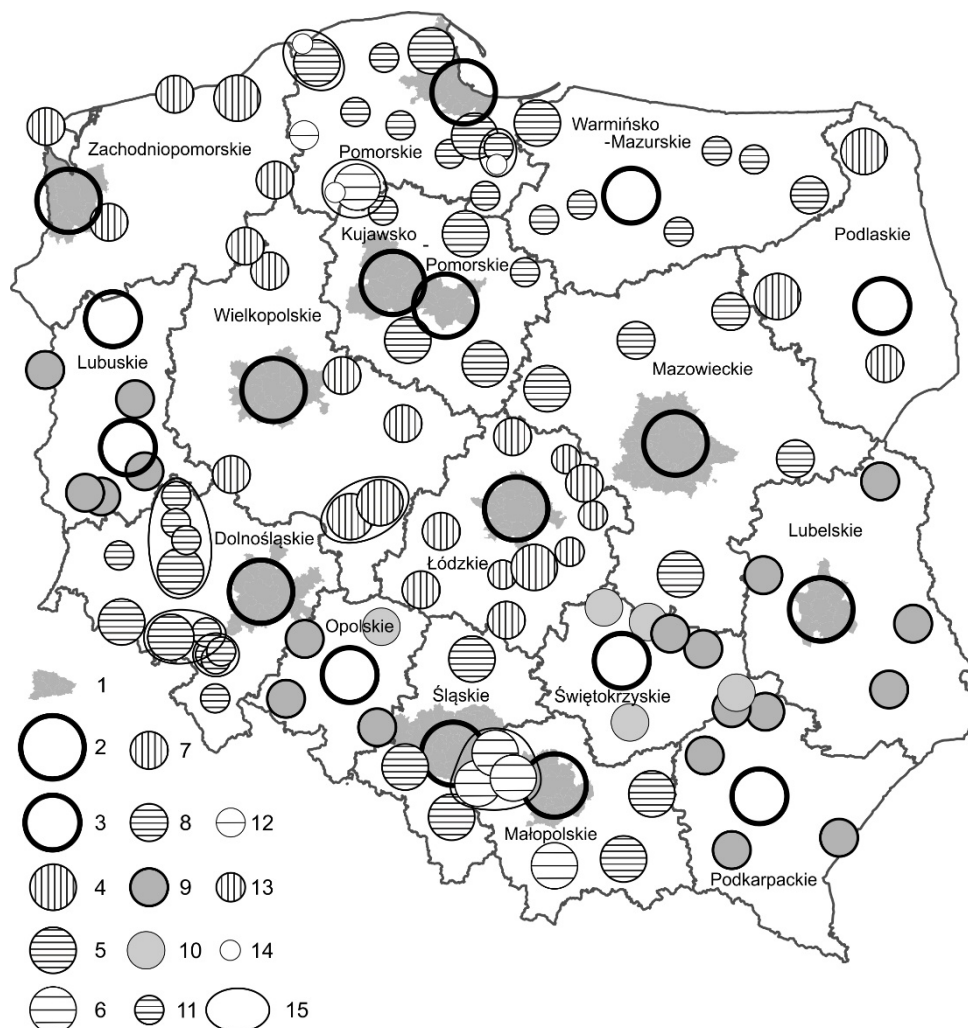
Service centres		Centres of development			
1a	1b	2a	2b	3a	3b
	Regional 84-230 ( <b>148</b> )	Supra-regional 63-108 ( <b>83</b> )	Regional 40 <sup>a</sup> 75-217 ( <b>106<sup>a</sup></b> / 113)	Supra-regional 76 ( <b>76</b> )	Regional 122 ( <b>122</b> )
Sub-regional 17-72 ( <b>49</b> )		Regional 26-77 ( <b>53</b> )	Sub-regional in Mazowieckie 48-77 ( <b>58</b> )	Regional 23-49 ( <b>47</b> )	Sub-regional 60 ( <b>60</b> )
	Regional Potential 20-39 ( <b>33</b> )		Sub-regional 10-74 ( <b>35</b> )	Supra-local 18-65 ( <b>51</b> )	Local I Category 24-34 ( <b>30</b> )

Numbers indicate population ranges from minimum to maximum in thousands, with the average in bold.  
<sup>a</sup>potential

Sources: Regional plans [20-25, 27-36] and author's own work.

In 10 voivodeships, poviát centres that are capitals of the poviát are elements of the settlement network established in the regional plans. This proves helpful in the comparison of settlement networks within different voivodeships, because the poviát centre can serve as a “common denominator”. Apart from administrative services there are many other services typical for poviát centres (e. g. hospitals of the lowest level, vocational schools and upper secondary schools). However, some regional plans do not identify poviát centres in the settlement network (despite the fact that capitals of the poviát exist in the administrative division). How could the level of centres in those regional plans be identified as higher than the poviát level? This was not a problem in Lubelskie [20], Lubuskie [21], and Śląskie [22] voivodeships, where sub-regional or regional centres are obviously above the poviát level, because their number is smaller than the number of other poviát capitals. In these voivodeships almost all local centres (apart from 1-2) are poviát capitals. On the contrary, only 2 capitals of poviáts in Zachodniopomorskie Voivodeship [23], and 3 in Małopolskie [24], are not included in the regional plans related to the sub-regional centres (Zachodniopomorskie) or supra-local centres I degree (Małopolskie). For this reason, sub-regional centres in Zachodniopomorskie and supra-local centres I degree in Małopolskie could be considered as centres with a similar rank to poviát, not above. In Pomorskie Voivodeship it was a problem to decide which level of centres in the

regional plan could be considered as above the powiat level [25]. The author has considered 6 sub-regional centres as centres above the powiat level. This decision can be discussable, because 6 sub-regional centres seem too many if there are only 5 capitals of powiat that are not included in any higher rank. Models of the settlement network classified into types and subtypes are showed in Table 1.



**Figure 1.** Settlement nodes in Poland in spatial development plans for voivodeships above the powiat rank according to classifications from Tables 1 and 2

1 – metropolitan areas; 2 – metropolitan capitals of voivodeship; 3 – other capitals of voivodeship; centres: 4 – supra-regional, 5 – regional in sub-types: 1b, 2b, and 3b, 6 – regional potential in type 1b, 7 – regional in sub-types 2a and 3a, 8 – sub-regional in sub-types 2b (Mazowieckie) and 3b, 9 – sub-regional (established) in sub-type 1a, 10 – sub-regional developing and potential in sub-type 1a, 11 – sub-regional in sub-type 2b (apart from Mazowieckie), and local I category in sub-type 3b, 12 – sub-regional potential in sub-type 2b, 13 – supra-local in sub-type 3a, 14 – lower rank belonging to a group; 15 – group of centres.

Sources: [26; regional plans [20-25, 27-36] and author's own work; graphic work by Sławomir Dorocki.

Voivodeship subtypes were analysed for similarity by comparing population (minimum, maximum, and average) as showed in Table 1. The number of former capitals of voivodeships (as centres well-



equipped with services), their share in % according to number of towns in subtypes, as well as the equipment of these towns with typical sub-regional services [19] were also analysed. The analyses suggest that centres differently named in different types can be considered counterparts (e.g. the ranks of the supra-regional centres are similar to the regional centres listed in types 1b, 2b and 3c). In each of these groups about 80% of centres were capitals of voivodeship in 1975-1998, and were identified as complete sub-regional service centres on the basis of four kinds of services located in these centres [19]. Other similarities of subtypes in voivodeships are indicated by place in Table 2 and by the size of circles presented in Figure 1.

**Table 2.** Settlement nodes apart from capitals of voivodeships in spatial development plans for voivodeships (regions) and divisions above gmina (commune)

Type	Names of centres	Voivodeships	Year	Number of levels	Number of centres of each level above poviat	Other levels above gmina (commune)
1a	CD	Lubuskie	2012	2	5 Sub-regional centres	Local
1a	C	Opolskie	2010	3	Sub-regional: 3 established, 1 developing	Poviat, local: urban, rural
1a	CD	Podkarpackie	2014	2	5 Sub-regional centres	Poviat
1a	C	Lubelskie	2015	3	4 Sub-regional centres	Local, other towns
1a	C	Świętokrzyskie	2014	3	Sub-regional: 2 established, 2 developing, 2 potential	Local poviat, other local
1b	C	Śląskie	2016	2	3 Regional = agglomeration	Local
1b	C	Małopolskie	2003	3	Regional: 2 existing, 2 potential (including a triple group)	Supra-local: I, II degree established, potential
2a	C	Dolnośląskie	2014	3	3 Regional, 7 sub-regional (including a triple group)	Poviat
2a	CD <sup>a</sup>	Podlaskie <sup>b</sup>	2003	3	2 Supra-regional, 1 regional	Poviat
2a	C	Wielkopolskie	2010	4	1 Supra-regional dual group, 4 regional	Supra-local (other poviat), local
2a	CG	Zachodniopomorskie	2010	4	1 Supra-regional, 5 regional	Supra-commune: I, II category
2b	CD <sup>a</sup>	Kujawsko-pomorskie	2003	4	3 Regional, 2 sub-regional	Supra-local: other poviat, other towns
2b	CD <sup>a</sup>	Mazowieckie	2014	3	2 Regional, 3 sub-regional	Poviat
2b	CD <sup>b</sup>	Pomorskie <sup>b</sup>	2010	3	3 Regional, 1 regional potential (a dual group), 6 sub-regional (including 2 dual groups)	Supra-commune poviat, other towns
3a	PG /CD <sup>a</sup>	Łódzkie	2010	5	1 Supra-regional, 5 regional, 4 supra-local	Supra-local (other poviat), local (other towns)
3b	C	Warmińsko-mazurskie	2016	5	1 Regional, 1 sub-regional, 5 local I category I	Local category: II (other capitals of poviat), III (other towns)

CD – centres of development; CD<sup>a</sup> – in Polish: *równowazenia rozwoju*, which is similar to sustainable development or more harmonized development; CG – centres of growth; PG – pole of growth; C (without complement).

Sources: Regional plans [20-25, 27-36] and author's own work.

### 3. Specifications in the plan text

As we can see in Table 2, settlement entities identified as centres are variously named in detail, but no centre is named as service centre. However, analyses of the text of plans indicates that the centres are treated independently of their names – considered *both* centres of services *and* centres of development.

Information is provided concerning: the role of centres in the development; relative information and statements concerning services developed; and the direction of spatial policy in relation to settlement nodes. The volume of text is varied. In some voivodeships, most of the plan text concerns the capital of the voivodeship and the metropolitan area, if the area is developing in the voivodeship.

Some plans provide only very general descriptive statements, as for example: strengthening the nodal function [27]; high social and economic activity functionally differentiated [28]; support for entrepreneurship [29]; concentration of economic and service functions; improve the competitiveness of the centers by increasing the capacity to develop; strengthening of functional links; or overcoming developmental problems [30]. As a result of the too general statements contained in some plans, centres at various levels are weakly distinguished.

Most plans provide only general information about branches of services (e.g. medical, cultural) that should be developed. Sometimes a general direction for action is indicated, e.g. improve standards for public and commercial services; supplement with missing segments of services; initiate deglomeration of some poviats standard services and create a new branch of services in smaller centres [29]. In some voivodeships (Kujawsko-Pomorskie, Małopolskie) there are lists of services for every level of centre, some of them in detail: vocational colleges, theatres, libraries including pedagogical and specialist subjects [25, 28]. Some even describe completion of the construction of a hospital in Grudziądz [28], halls, and arenas with information about size [25]. However, according to interviews with a clerk of the Marshal's Office, these lists and the regional plans as a whole do not provide a tool for the localization of public services.

Some plans establish policy guidelines for following:

- Create favourable conditions for attracting investment [29] among others: shape attractive investment areas [20, 31], improve professional qualifications [29], strengthen institutions of support for entrepreneurship [28];
- Create favourable conditions for the development of entrepreneurship and innovation [32];
- Improve the quality of services around business;
- Improve the attractiveness of urban space [30], including public spaces, and the revitalization and revaluation of public utilities [29].

In Łódzkie Voivodeship functions for every town are defined and branches of industry as well as some services are individually listed. In this voivodeship, the pole of growth is also defined as supporting the development of so-called "growth units" – knowledge-based institutions and services for businesses and the general public – resulting first in the increase of localization attractiveness, and then in new development impulses, as well as multiplier effects [33]. The plan in the Mazowieckie Voivodeship indicates for regional centres: the use of existing and planned Special Economic Zones; clusters development; development of economic and financial infrastructure; congress centres; financial, trade and exhibitions infrastructure; and development of a logistics base of regional importance [31]. Some plans propose in the regional centres: development of a knowledge- and innovation-based economy [27, 30], knowledge transfer [30], or high technology industry [20]. Some plans indicate diffusion of development factors into functional surroundings [29, 30], and in plans prepared after 2011: establishment of functional urban areas [30]. The functional types of towns are defined in some plans. In most voivodeships, specifications in the plan text are too general and seem to be rather useless in the practice of regional policy.

#### 4. Discussion and proposals

It is unclear what the hierarchical level names (supra-regional, regional, sub-regional) mean with regard to centres of development. In many cases the role of the centre in development is actually local (sometimes sub-regional) as it relates to commuting range, but in some cases the largest relation that exists between the development of a centre and its surrounding is international (e.g. if some products are sold abroad or tourists come from abroad) [19]. What is especially unclear is the difference between regional and sub-regional centres according to their importance in development. In some voivodeships established after 2011, formal criterion derived from the NSDC 2030 is used for defining

the rank of centres: regional ones consist of those having above 100 thousand inhabitants, and sub-regional ones – above 50 thousand [3].

Names like “regional centres of development” (also: national, sub-regional) derive from the Plan for the Country’s Spatial Management up to the year 1990 [37] and the directions for spatial planning of new voivodeships legislated in 1975 [38]. “National centres of development” were interpreted as centres about which the national (central) level had decided. Some names of centres were repeated in the National Spatial Arrangement Policy [39] and in NSDC [3].

Sobolewski [40] claimed that there was a need to distinguish between development centres and service centres. However, during the next forty years such a distinction was never made. The author considers that regional plans should determine two kinds of centres: hierarchical service centres and non-hierarchical centres of development. All settlement nodes included in the regional plan should be defined according to their rank as a service centre in the service network. Some entities (cities, towns) can also be defined as centres of development according to their role in development and type of policy concerning these entities. Other information important for development or policy, such as functional type of town or city can also be included in the regional plan.

Rank of **service centres** can be defined according to the model established in general for all of the country in NSDC, but adaptation to regional specificity should be possible. No such situation has been established in the existing NSDC [3]. For every rank of service centre a list of services should be assigned, like in Małopolskie Voivodeship [24]. Defining sub-regional centres is the most important task in regional plans because the powiat (county) rank of town can be the same as the administrative capital of the powiat. One or two types of sub-regional centres (Category I and II) may be considered, with larger and narrower lists of services. Similarly, distinguishing powiat centres Category I and II with various lists of services is also possible (obviously this does not concern administrative services). On the level between powiat and gmina (commune), “supra-local” or “supra-commune centres”, and in some cases “support centres for powiat centres” can be established. Due to a lack of spatial planning at the powiat level in Poland, the question may be discussed: which authorities should establish these centres – powiat authorities or regional authorities in the regional plans? Also, distinguishing whether centres are completed or uncompleted can be necessary in some cases.

Proposals described above refer to Christaller's theory. Questions appear as to whether this theory is still valid, and whether a hierarchical model of service network should be used. Details of the theory (number of levels, distances between centres) obviously changed, but the conceptual apparatus and its regularity are still valid [11, 41]. However, according to the author’s research in 2014, Polish regularity at the sub-regional level, especially in the concentration of services is too small. The author analysed the localization of four kinds of sub-regional services and has identified 16 complete sub-regional centres. If the concentration were greater (i.e. if more services were located in the same towns), there would be 24 complete sub-regional centres [19].

Concentration of services according to the model established in the regional plan has the following advantages:

- Joining of travel destinations and fewer journeys as the effect (social, economic, and ecological effects).
- Concentration of traffic in directions towards service centres makes road modernization and public transport in these directions more efficient.
- Readability of public service location decisions (according to rational, non-political criteria).

Joining of travel destinations is especially important for people living in areas where public transport is weak. If for example there are two courses of buses daily, it is practical to take one trip to a specialised hypermarket, cinema and aqua park. However, joining of travel destinations is not possible for hospitals and other services, or for services operating on weekdays and services that are available weekends.

In Germany, *Zentrale-Orte Konzept* (Concept of Central Places) is one of the foundations of spatial policy. Simple criteria of population and distance determine the planning rank of centres in a three-level system including basic, intermediate and main centres. Public services are located according to



these ranks [11]. A criticism of this system as static and only normative appeared along with the idea for changing the system into an instrument of strategy [42].

Applying the concept of service based on a hierarchical model can inform and decide the following:

- Localization of public services (facilities, institutions, equipment).
- Guidelines for authorities and urban planners in towns and cities concerning the creation of conditions for the location of commercial services (planned area, infrastructure, promotion).
- Direction for some types of interventions - e.g. conformity to the establishment of a regional plan treated as an obligatory or preferred condition when applying for public funding by competition.

The second kind of centres, **centres of development**, should be distinguished according to their role in development and by type of policy. The following distinctions can be made:

- Role of the centre in the activation of surroundings, e.g. activation of surroundings as a target of commuting; important for the activation of surroundings - requiring development and strengthening and enlargement of the activating impact;
- Level of development and necessity of action for the development of centres, e.g. the centre is well-developed; or the centre needs support for development;
- Types of actions in the regional policy, e.g. improvement in the competitiveness of the local exogenous sector; or supporting the creation and promotion of new investment areas [43].

## 5. Conclusions

Various models of settlement networks exist in Polish regional plans – varying in name and in the number of levels of hierarchical centres. The names are unclear for interpretation. In some plans, text content is far too general. Centres defined in the regional plans do not serve as tools for the localization of services. Therefore, the author recommends that regional plans should clearly determine two kinds of settlement nodes: hierarchical service centres and non-hierarchical centres of development, distinguished according to their role in development and by the type of policy designed for these centres.

The following topics of international comparative research are proposed:

- Settlement network as defined in the regional plans of various countries
- Roles of regional plans and models of settlement networks (as defined by sets of services) in respect of regional policy and reality in the localization of services.

## References

- [1] L. T. Dąbrowski, *Projektowanie regionalne. Regionalne plany zagospodarowania przestrzennego*, PWN, Warszawa, 1977.
- [2] Dziennik Ustaw z 2016 r. poz. 778, 904, 961, 1250, 1579. *Ustawa z dnia 27 marca 2003 r. o planowaniu i zagospodarowaniu przestrzennym*.
- [3] Ministerstwo Rozwoju Regionalnego, *Koncepcja przestrzennego zagospodarowania kraju 2030*, Warszawa, 2011.
- [4] R. P. Camagni, and C. Salone, “Network urban structures in northern Italy: elements for a theoretical framework”, *Urban studies*, 30(6), pp. 1053-1064, 1993.
- [5] D. F. Batten, “Network cities: creative urban agglomerations for the 21st century”, *Urban studies*, 32(2), pp. 313-327, 1995.
- [6] R. Domański, *Gospodarka przestrzenna: Podstawy teoretyczne*, WN PWN, Warszawa, 2006.
- [7] P. J. Taylor, M. Hoyler, and R. Verbruggen, 2010, “External urban relational process: introducing central flow theory to complement central place theory”. *Urban Studies*, vol. 47(13), pp. 2803-2818, 2010.
- [8] P. Krugman, “Confronting the mystery of urban hierarchy”, *Journal of the Japanese and International Economies*, vol. 10(4), pp. 399-418, 1996.

- [9] J. B. Parr *The location of economic activity: central place theory and the wider urban system*, [in:] *Industrial Location Economics*, ed. P. McCann, Edward Elgar Publishing Ltd: Cheltenham pp. 32-82, 2002.
- [10] P. Korcelli, M. Degórski, D., Drzazga, T. Komornicki, T. Markowski, J. Szlachta, G., Węclawowicz, J. Zaleski, J. Zaucha, „Ekspercki projekt Przestrzennego Zagospodarowania Kraju do roku 2033”, *Studia KPZK PAN*, vol. CXXVIII, Warszawa, 2010.
- [11] Ł. Zaborowski, „Sieć ośrodków regionalnych w Koncepcji Przestrzennego Zagospodarowania Kraju 2030. Próba uporządkowania według czynników wielkości i odległości”, *Przegląd Geograficzny*, no. 86(4), pp. 591-619, 2014.
- [12] A. Kwiatek-Sołtys, A. Runge, Małe średnie miasta Polski na osi kontinuum osadniczego [w:] M. Soja, A. Zborowski (red.), *Człowiek w przestrzeni zurbanizowanej*, Instytut Geografii i Gospodarki Przestrzennej UJ, Kraków, 151–162, 2011.
- [13] D. Sokołowski, Centralność a węzłowość większych miast w Polsce, *Przegląd Geograficzny*, 77, 4, pp. 507-526, p. 83-101, 2005.
- [14] A. Runge, Metodologiczne problemy badania miast średnich w Polsce. *Prace Geograficzne*, vol. 129, pp. 83-101, 2012,
- [15] W. Dziemianowicz, J. Szlachta, K. Szmigiel-Rawska, ed., *Sub-regionalne bieguny wzrostu w Polsce*, Uniwersytet Warszawski, Wydział Geografii i Studiów Regionalnych, Warszawa, 2011.
- [16] R., Guzik, J. Działek, M. Plaza, A. Kołoś, *Czynniki i ograniczenia rozwoju miast województwa pomorskiego w świetle relacji przestrzennych i dostępności komunikacyjnej*, Urząd Marszałkowski Województwa Pomorskiego, Gdańsk, 2012.
- [17] R., Guzik, A. Zborowski, A. Kołoś, G. Micek, K. Gwosdz, P. Trzepacz, T. Chaberko, P. Kretowicz, M. Ciechowski, M. Dej, N. Grad, „Dostępność komunikacyjna oraz delimitacja obszarów funkcjonalnych”, in: B. Domański, A. Noworól, *Małopolskie miasta – funkcje, potencjał i trendy rozwojowe*, Małopolskie Obserwatorium Polityki Rozwoju, Kraków, pp. 88-134, 2010.
- [18] J. Suchta, A. Drońska, A. Celmer, „Rola dużych i średnich miast województwa warmińsko-mazurskiego w procesie rozwoju regionu”, *Acta Scientiarum Polonorum*, Olsztyn, pp. 5-20, 2007.
- [19] J. Sołtys, “Sub-regional Service Centres in Reality and Regional Planning in Poland”, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, no. 431 (Local and Regional Economy in Theory and Practice), pp. 9-17, 2016.
- [20] Urząd Marszałkowski Województwa Lubelskiego, *Plan zagospodarowania przestrzennego województwa lubelskiego*, Lublin, 2015.
- [21] Sejmik Województwa Lubuskiego, Załącznik nr 1 do uchwały XXII/191/12 Sejmiku Województwa Lubuskiego z dnia 21 marca 2012.
- [22] Województwo Śląskie, *Plan zagospodarowania przestrzennego województwa śląskiego 2020+*, Katowice, 2016.
- [23] Marszałek Województwa Zachodniopomorskiego, *Plan zagospodarowania przestrzennego województwa zachodniopomorskiego*, Szczecin, 2010.
- [24] Urząd Marszałkowski Województwa Małopolskiego, *Plan zagospodarowania przestrzennego województwa małopolskiego*, Kraków, 2003.
- [25] Urząd Marszałkowski Województwa Pomorskiego, *Plan zagospodarowania przestrzennego województwa pomorskiego*, Gdańsk, 2016.
- [26] P. Śleszyński, „Delimitacja Miejskich Obszarów Funkcjonalnych stolic województw”, *Przegląd Geograficzny*, no. 85 (2), pp. 173-197, 2013.
- [27] Sejmik Województwa Dolnośląskiego, *Plan zagospodarowania przestrzennego województwa dolnośląskiego. Perspektywa 2020*, Załącznik nr 1 do Uchwały nr XLVIII/1622/2014 Sejmiku Województwa Dolnośląskiego z dnia 27 marca 2014 r., Wrocław, 2014.

- [28] Kujawsko-Pomorskie Biuro Planowania Przestrzennego i Regionalnego we Włocławku, *Plan zagospodarowania przestrzennego województwa kujawsko-pomorskiego*, Włocławek, 2003.
- [29] Zarząd Województwa Świętokrzyskiego, *Zmiana planu zagospodarowania przestrzennego województwa świętokrzyskiego: Kierunki polityki przestrzennej*, Kielce, 2014.
- [30] Samorząd Województwa Warmińsko-Mazurskiego, *Plan zagospodarowania przestrzennego województwa warmińsko-mazurskiego*, Olsztyn, 2015.
- [31] Samorząd Województwa Mazowieckiego, Mazowieckie Biuro Planowania Regionalnego, *Plan zagospodarowania przestrzennego województwa mazowieckiego*, Warszawa, 2014.
- [32] Zarząd województwa podlaskiego, *Plan zagospodarowania przestrzennego województwa podlaskiego*, Białystok, 2003.
- [33] Biuro Planowania Przestrzennego Województwa Łódzkiego w Łodzi, *Plan zagospodarowania przestrzennego województwa łódzkiego. Aktualizacja*, Łódź, 2010.
- [34] Samorząd Województwa Wielkopolskiego, *Plan zagospodarowania przestrzennego województwa wielkopolskiego*, Poznań, 2010.
- [35] Zarząd Województwa Opolskiego, *Plan zagospodarowania przestrzennego województwa opolskiego*, Opole, 2010.
- [36] Zarząd Województwa Podkarpackiego, *Plan zagospodarowania przestrzennego województwa podkarpackiego. Perspektywa 2030. Projekt*, Rzeszów, 2014.
- [37] Państwowe Wydawnictwo Naukowe (PWN), „Plan przestrzennego zagospodarowania kraju do roku 1990”, *Biuletyn KPZK PAN* no. 85, Warszawa, 1974.
- [38] J. Suliga, „Zasady kształtowania systemu osadniczego w planach zagospodarowania przestrzennego województw (materiały do projektowania)”, IKŚ, Warszawa, 1976.
- [39] Prezes Rady Ministrów, *Koncepcja polityki przestrzennego zagospodarowania kraju*. Monitor Polski 26, pp. 503-595, 2011.
- [40] S. Sobolewski, „Kształtowanie systemu osadniczego w planach zagospodarowania przestrzennego województw”, *Biuletyn IKŚ*, no. 7-8, 1978.
- [41] M. Fujita, P. Krugman, T. Mori, “On the evolution of hierarchical urban systems”, *European Economic Review*, no. 43(2), pp. 209-251, 1999.
- [42] H. Zeck, *Zentrale Orte als räumliches Konzept fuer Anpassungsstrategien, Informationen zur Raumentwicklung*, vol. 12, Berlin, 2003.
- [43] Sołtys, J., “Spatial conditions for development of peripheral areas – the case of northern Poland”, *52nd Congress of the European Regional Science Association: "Regions in Motion - Breaking the Path"*, Bratislava, 21-25 August 2012.