

Article

European Land Use Spatial Data Sources and Their Role in Integrated Planning: Opportunities and Challenges for Poland

Beata Stelmach-Fita 

Geographical Institute, Pedagogical University of Krakow, 30-084 Krakow, Poland;
beata.stelmach-fita@up.krakow.pl

Abstract: One of the 34 themes of the spatial datasets of Directive 2007/2/EC INSPIRE is ‘land use’, rightly described independently of ‘land cover’. Laws in most countries, apart from the Netherlands, do not consider the electronic form of plans as a legally binding document. As far as the elaboration step and the adoption step are concerned, the main land use requirement is related to the datasets that describe existing land use at present and in the past. Surveys and case studies concern Poland and were carried out in two stages, I in 2011–2013 and II in 2017–2019. Previous research on this subject concerned ‘planned land use’, especially attempts to standardize the classification of sub-local zoning plans and omit the creation of a metadata profile for existing land use. The main goal of the qualitative research is to assess the completeness of the available spatial datasets of existing and planned land use, conditioned by the needs of users. The author recommends the establishment in Poland of a new type of regulatory ‘Land Use Plan’ for the area of an entire municipality. As a summary, the author’s model of ‘The spatial planning system in the integrated development system of Poland’ was presented.



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Keywords: INSPIRE; integrated planning; comprehensive planning; land use planning; land use datasets; spatial planning systems; zoning plans; spatial data information

1. Introduction

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 (INSPIRE) established the Community Infrastructure for Spatial Information. According to A. Annoni (2011), the key aim of INSPIRE is to make more and better spatial information available for the development of community policies, starting with the environmental sector and then covering the agricultural, transport, and spatial planning sectors [1,2]. Challenges related to the lack of availability, quality, organization, and sharing of spatial information are common in many policies and activities and are encountered at many levels of public authority in Europe. The JRC Report, “A conceptual model for developing interoperability specifications and harmonization of spatial datasets” [3], deals with the search for solutions for the interoperability and harmonization of spatial datasets related to the 34 INSPIRE themes. One of these themes is land use (Land Cover is a separate topic), defined in the Directive as territory characterized according to its current and future planned functional dimension or socio-economic purpose (e.g., residential, industrial, commercial, agricultural, forestry, or recreational). The land use theme is itself split into two different types: existing land use (ELU), which objectively depicts the use and functions of a territory as it has been and effectively still is in real life, and planned land use (PLU), which corresponds to spatial plans, defined by spatial planning authorities, depicting the possible utilization of the land in the future. Two types of classification systems are supported by the land use theme, the (obligatory) Hierarchical INSPIRE land use Classification System (HILUCS), which is a multi-level, classification system that will apply to the existing and planned land use, and the (optional) specific classification system in use in a member state (D2.8.III.4 Data Specification on Land Use, available online: <https://inspire.ec.europa.eu/id/document/tg/lu>) (accessed on 20 July 2020).

The intention of the authors of the INSPIRE theme Land Use was to create a universal system for monitoring general changes in land use in order to support and verify the assumed policies and strategies for environmental protection.

The created legal framework is in the European definition of the above-mentioned. The subject matter in the PLU part refers to ‘planning documents’ in electronic form and not ‘other documents determining spatial development’, i.e., administrative decisions, which are used to implement more than 50% various investments in Poland (Supplementary Materials: Figures S1 and S2).

On the day of commencement of the first stage of the research on 1 June 2011, four types of planning documents (most of which were criticized due to their ineffectiveness) and 14 types of administrative decisions conditioning spatial development, building permits, and government programs were in force in Poland (Supplementary Materials: Table S1). Even then, this large number of different types of plans and decisions indicated that the implementation of the INSPIRE Directive in the field of LU in Poland had become a real challenge. The implementation of the new guidelines coincided with the criticism of the spatial planning system and the initiated reforms. However, these two issues should not be combined: (1) the planning system in Poland needs to be repaired, and (2) the LU guidelines require implementation; however, many experts expressed the opinion that INSPIRE has become an opportunity for Poland to reform the spatial planning and development system. Spatial planning is an integral element of development policy. However, in Poland, despite numerous amendments to the regulations, these two policies are not effectively combined with each other (Supplementary Materials: Summary). Spatial planning is the domain of regional, subregional, and local levels, i.e., planning relating to the area of at least one municipality or several municipalities, and as such, typical ‘zoning plans’ are listed in the ‘land use’ specification. In the EU countries, there are generally ‘zoning plans’ and ‘land use plans’ (Netherlands, Austria, England, Germany, the Czech Republic, and France). The analysis of planning systems and types of plans in mentioned countries is important because the representatives of these countries created the ‘land use specification’, taking into account the types of plans typical for the European Union countries. Polish ‘sub-local zoning plans’ are a kind of hybrid between typical ‘zoning plans’ and very detailed ‘German development plans’. In Poland, some sub-plans often include two or three plots. As explained in the ‘land use specification’, such detailed plans are not required to be available in the European level of IIP (D2.8.III.4 Data Specification on Land Use—Draft Guidelines). The land use specification distinguishes between two levels: national and European service. The requirements for making datasets available at the European level must meet all the requirements of the specification (Supplementary Materials: Interview 8).

The aim of the research was to identify the most important needs and limitations from the user’s point of view regarding the provision of comparable, complete data on land use, along with an indication of recommendations for significant directions of activities aimed at harmonizing spatial datasets in this topic.

The thesis (T1): Including a new type of land use plan in the SDI for the entire municipality, obliging all administrative bodies to prepare all plans and location decisions, will solve the problem of incompleteness of land use datasets at the local level as well as strengthen participation in the new integrated planning at the local, sub-regional, and regional levels.

Polish researcher Jan M. Chmielewski wrote first in 2008 and again in 2016 [4,5], and B. Stelmach-Fita wrote in 2014 [6], about the need to establish a new type of land use plan in Poland, modeled on the German land use plan. According to J. M. Chmielewski [4,5] and A. Tölle [6], comparing the Polish planning document “Study of the conditions and directions of spatial development of a municipality” (suikzp, ‘study’) (SUiKZP-Studium uwarunkowań kierunków zagospodarowania gminy) with the German Flächennutzungsplan ‘land use plan’ is not accurate, because the Polish ‘study’ expresses the spatial policy of the municipality, and the ‘German land use plan’ is framework-regulatory, referring primarily to existing land use [4–6]. Importantly, the ‘German land use plan’ obliges local

government bodies to harmonize not only when drawing up sub-local plans but also when issuing all administrative decisions. According to J. M. Chmielewski and A. Tölle, it is also wrong to identify the very detailed ‘German land use plan’ with the Polish mpzp (sub-local ‘spatial development plan’/‘sub-local zoning plan’) [4–7] (MPZP, or Miejscowy plan zagospodarowania przestrzennego: there are two types of translation of this plan in the literature). The German Bebauungspläne (spatial development plan) sets out in some detail the method of land development for an identified investment, while the Polish plan only sets out the framework of conditions for the development of the land and has no investment power [4–6].

Simply put, the descriptions of the technical specification LU show that, first, it was prepared for typical zoning plans covering the area of the entire municipality, which function in most European countries except Poland. Considering that sub-local zoning plans in Poland are not obligatory, and covering the municipality with them may be small, sharing only these plans in the infrastructure suggests that there may be a lack of spatial data in other areas. In the absence of a plan, building permits are issued based on administrative ‘location decisions’ or several types of ‘special decisions’. In practice, decisions that are often issued are inconsistent with the spatial policy implemented in the municipality and described in the ‘study’ (suikzp) (5, Supplementary Materials: Interview 2). The biggest paradox is that over 51% of construction investments, especially housing ones, are implemented based on ‘location decisions’ issued by one-person authorities (mayor or city president) and not based on the sub-local zoning plans. The definition of PLU does not require access to datasets other than plans. There is no obligation to access the datasets of the location of administrative decisions. It is up to the decisions of individual EU countries to decide what solutions they will adopt to share complete datasets, including considering complementary hybrid solutions (e.g., links to decision location sets) (D2.8.III.4 Data Specification on Land Use; interviews with experts in the implementation of technical guidelines, geographic information modeling). The general arrangement of geoinformation in the area in question would require a one-time identification and reliable description of all documents determining spatial development and the cause-and-effect relationships between them, in line with the principle that any changes in spatial development should be documented and made available to the authorities that need this information, and then to solutions to the resulting problems. Actions of this type would allow conclusions to be drawn about the ineffectiveness of the currently functioning planning acts and indications for the necessary legislative changes. The results of the discourse and the questionnaire research conducted by the author in 2011 spoke in favor of the rationality of such a solution [8]. Unfortunately, no such action in Poland was taken [8]. Defective law and the lack of a definition of ‘planning document’ prevented the establishment in Poland with a uniform land use classification for planning documents [8], [Supplementary Materials: Context]. In turn, many researchers in Poland have been writing about the defective legal system for several years, including lawyers, planners, town planners, geographers, and surveyors. In 2018, W. Izdebski, P. Śleszyński, Z. Malinowski, and M. Kurska wrote in the article “Morphological analysis of local plans in Poland” about the various sizes, shapes, and topological features of Polish sub-local zoning plans [2,9]. The article is the first in Poland to analyze the structure (area, borders, shape, etc.) based on a large sample of several thousand local plans. The conclusions from the research confirm the results of the 2011 expert survey conducted by B. Stelmach-Fita [2,7,8] that the method of selecting areas to be covered by plans and defining their boundaries in the field do not contribute to the improvement of spatial order, and that the spatial extent of the impact of these documents in large part is not larger than in the case of location decisions. The results of that research indicate the ineffectiveness of the currently functioning types of plans in Poland and problems with the implementation of INSPIRE technical guidelines regarding the incompleteness of the available LU datasets, conditioned by the needs of users [2,7,8].

A general framework for a new infrastructure in Poland was established through the Act on Spatial Infrastructure and Information of March 14, 2010 (Ustawa o infrastrukturze

informacji przestrzennej z 4 marca 2010 roku (t. j. Dz. U. 2021 poz. 214)) [10]. The minimum requirements in this regard have been met.

Previous research in Poland in this area mainly concerned a metadata profile for the ‘planned land use’, standardization of graphic symbols for very detailed ‘local zoning plans’, and skipping ‘existing land use’. The types of land use are still not classified. Currently, the national geoportal provides access to datasets on planned spatial development resulting from the various types of planning acts in force: the ranges/boundaries of these plans and graphic attachments in the form of raster images with georeferencing and/or, in the case of ‘local zoning plans’, also in the form of heterogeneous spatial datasets. Implementation of the guidelines of the INSPIRE Directive coincided with the reform of the spatial planning system that had started in Poland, but which requires repair. In one opinion, a lack of financial resources may limit the scope of actions taken at the national level to only those allowing for the minimum requirements of the INSPIRE Directive to be fulfilled [11]. In parallel with European activities concerning the sharing of planning documents, new solutions that provide previously unavailable possibilities are appearing. This brings hope for a broader use of the distributed and heterogeneous information found in zoning plans without giving up the attempts taken at standardization [11]. Of course, good practices of making tiny areas of sub-local zoning plans consistent with the European HILUCS classification available on the geoportal of the Wrocław City Hall are published and popularized [12].

In many cities in Poland, online map portals play the role of a guide to the world of spatial data. The richness of this data is indicated by the number of thematic layers and the size of the provided collections. They may, in a sense, testify to the affluence and credibility of the host of a given area and the dialogue with society (building democracy), inspiring trust and fitting into the model of contemporary strategic management ‘governance’. In USAID (the U.S. Agency for International Development), following Laurence, E. Lynn, and others [13], the definition of governance is understood as “the ability of government to have an effective, efficient and accountable public policy management process that is open to citizen participation and aims to strengthen the democratic system”.

Due to the extensiveness of the issue, many simplifications were intentionally used.

Particular attention was paid to the new, strategic approach to planning the development of territories: new integrated planning, requiring the provision of various spatial management entities (voivodeships, metropolitan regions, and municipalities) with many up-to-date, reliable spatial data. The new integrated planning in a time of dynamic of change is more flexible and resilient and involves all citizens.

The causes of problems with the implementation of the INSPIRE Directive in Polish conditions were indicated, and recommendations for further directions of activities were presented, along with the proprietary model “Spatial planning in integrated development planning in Poland”. The author recommends and supports the directions of the initiated reform of the spatial planning system, especially regarding the need to establish a new type of plan covering the area of an entire municipality, but points out and justifies that this new General Plan or Land Use Plan should not apply to citizens or property owners in terms of compensation payments, but should be obligatory for all authorities drawing up various other sub-local plans and issuing location decisions.

Establishing such a plan and making it available in the Spatial Information Infrastructure would solve the problem of the lack of completeness of datasets in terms of ‘land use’ and the lack of a plan type to be made available on the European website. The author leaves these issues for further discussion.

2. Theoretical Background of the Research

2.1. The Evolution of Land Use Planning in the World

There are no internationally agreed-upon classifications of land use and land cover. Corine land cover and the international FAO soil classification system seem to be the most-used classifications. Both theory and practice tell us that although land cover (LC)

and land use (LU) are closely related, many proposed land use classifications are actually mixing land cover and land use, where natural and semi-natural vegetation are described in terms of land cover, agricultural and urban areas in terms of land use, and, in particular, the definition of forests is a combination of land cover and land use. Nevertheless, it is necessary to develop an international LU classification separately from a LC classification due to the differences between these two and the importance of LU statistics for related policy analysis and decision making. LC is defined as the observed (bio)-physical cover of the earth's surface. Such an observation can be made by the human eye, aerial photographs, satellite sensors, or simply existing maps. LU is difficult to 'observe.' Field and ground information such as surveys and censuses are usually required. In The Global Land Outlook Working Paper, Nations Convention to Combat Desertification, author G. Metternicht [14] presented various types of land use planning in use around the world and showed the impact of land use and spatial planning for supporting sustainable land use and management. Competition for land is increasing as demand for multiple land uses and ecosystem services rises. Managing increasing competition for the supply of these services, accounting for different stakeholder interests, requires efficient allocation of land resources. [14,15]. The main goal of planning is the 'qualitative development of resources', which should be implemented in a democratic process of agreeing upon social, economic, and environmental requirements.

2.2. Evolution of Land-Use and Spatial Planning in Europe

2.2.1. Spatial Data Infrastructure and Its Role in Contemporary Planning

M. Schrank, J. Neuschmis, D. Petti, and W. Wasserburger see the relationship between the new strategic approach to development planning, 'integrated planning', and the creation of an SDI in Europe [16,17]. This infrastructure has the potential to become a kind of integrator for many stakeholders, users of the EU space, creating opportunities for democratic management of the space of a given territory, especially in metropolitan regions. Contemporary planning operating in other countries (Germany, the Netherlands, Austria, and France), despite certain rules ensuring stability, becomes more flexible and turns into a process. Therefore, spatial policy tools are adapted to the process in which a different consensus is reached in dialogue. For these reasons, planning does not perform standardized, fixed operations, but is always a complex, unique process that involves technical tasks and specific methods but also, and to a large extent, creativity. The planning process is not linear, but turns out to be continuous, which means it constantly retrieves new data entered in this development (Figure 1). Side effects and outcomes of planning processes need to be monitored in order to integrate new outcomes from the various ongoing planning processes. It can be said that the planning cycle never ends and that when one cycle is finished, the next has already started.

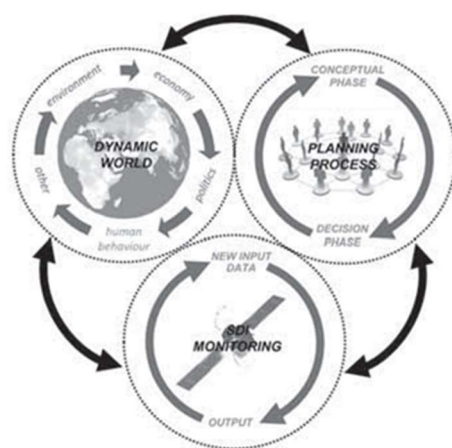


Figure 1. SDI as data provider in the never-ending planning cycle. Resources: M. Schrank, J. Neuschmis, D. Petti, and W. Wasserburger [16].

Integrated planning has a variety of definitions [18]. Interpretation depends on whether the researcher refers to spatial planning or area management. Polish researchers refer to the interpretation by A. Cieślak [19], which is related to the integrated management of the coastal area, a kind of functional area. A. Cieślak calls integrated area management a process aimed at ensuring sustainable development in each area. The concept of sustainable development is about people's well-being. In the concept of sustainable development, environmental protection issues, including nature conservation, are of course important, but only as one of many elements that contribute to the well-being of people, such as the national and local economy, social affairs, security and risk management, space management, culture, cultural heritage, etc. Sustaining the development of a given area, and above all the self-sustaining well-being of people, is the overriding goal of sustainable development [19].

2.2.2. Classification of Spatial Planning System in EU

There are several definitions of spatial planning. Referring to the European Charter for Regional/Spatial Planning adopted in 1983 by the European Conference of Ministers responsible for regional planning (CEMAT): "Spatial/regional planning is the geographical expression of society's economic, social, cultural and environmental policies. At the same time, it is a scientific discipline, administrative technique, and policy as an interdisciplinary and comprehensive approach to sustainable regional development and the physical organization of space, in line with the overall strategy". Analyses of spatial planning systems in European countries have been carried out by Dylewski, Nowakowski in 2004 (Poradnik Urbanisty: standardy, przykłady, przepisy (2004)—A copy provided by the co-author M. Nowakowski) [20], Schrenk, Neuschmid, Wasserburger in 2011 [21], Ledwoń in 2011 [22], Larsson in 2013 [23], Chmielewski in 2016 [5], and many other authors. Importantly, in the models of the spatial planning systems of 'older EU' countries, although they differed in detail, the public good—local and supra-local—was protected in local plans and location decisions, the double protection system (France, the Netherlands, Germany, and Great Britain), by:

- Nationwide comprehensive collections of urban planning standards;
- Direct, obligatory planning guidelines of higher order plans to local plans;
- Control systems for the implementation of these safeguards.

Currently, spatial development in Europe is monitored by ESPON (European Observation Network for Territorial Development and Cohesion).

Newman and Thornley (1996) defined the basic families of spatial planning systems in Europe, dividing them into British, Napoleonic, Germanic, and Scandinavian [22]. In turn, following S. Ledwoń, the compendium of planning systems of the EU from 1997, classifying systems according to different traditions, lists:

1. Planning the regional economy ('economic and regional');
2. Comprehensive planning ('comprehensive integrated');
3. Based on land use management ('land');
4. Urban planning ('defined as urbanism').

Both lists were prepared before the enlargement of the European Union and therefore did not take into account the countries of Eastern and Central Europe, such as Poland. They form a separate group because their planning systems, along with political changes, were subject to transformation and therefore are defined separately as systems of new members of the European Union [22].

2.2.3. European Spatial Planning in Practice: Selected Countries

Because the technical specification of land use was created mainly by representatives of the Netherlands, Germany, and Austria, where there are typical local land use plans, which are fundamentally different from the sub-local zoning plan in Poland, the spatial planning system is presented below in Austria, the Netherlands, and Germany.

In practice, most planning systems are organized hierarchically and function in a top-down manner. Planning systems in the Netherlands are an example of contemporary planning, and in Germany of comprehensive planning. An important issue is the legal status of online plans, which has already been introduced in the Netherlands but is a long way from existence in many other countries, where the stamped paper plan in the city administration is still the only legally binding plan (D2.8.III.4 Data Specification on Land Use—Draft Guidelines in English). The new law in the Netherlands on spatial planning from 2008 contains less regulation and control, and an approach aimed at isolating guiding principles beyond this legal act, referring to the NEN 360 information model (including all spatial policy instruments). At all levels of management, there are structural concepts of development as strategic documents of spatial policy, involving citizens and social organizations. Local zoning plans are mandatory for all municipalities. There are three types of zoning plans included in the ‘Zoning plan’ Model: The Scheme, the Integration Plan, and the National Development Vision [2,24]. Each of the main functional zones has its own definition or an assigned second level of land use detail. In the analyzed planning systems, there are operational zoning land use plans clearly indicating areas where nothing is allowed to be built. In practice, the best organized planning systems are hierarchical and work up and down. The instruments of spatial policy in the Netherlands (Figure 2) are like Austria (Figure 3).

In Germany, urban development planning (local development) is carried out within statutory and non-statutory functions. Integrated development planning is currently extended comprehensive planning, and mainly concerns the non-statutory (informal) division, which developed in connection with the need to plan qualitative transformations of urban areas [6,25]. The legal and substantive framework for planning the development and spatial management of municipalities is created by the Code of Municipality Planning. In accordance with the provisions of the above-mentioned Code, the municipality draws up a land use plan for the entire municipality, its substantial part or a group of municipalities, and a development plan for parts of the municipality. The land use plan is not a universally binding law and is binding only on municipal and other public authorities. It has no direct consequences for third parties, i.e., it may be subject to changes in the manner provided for by law without the need to pay compensation to property owners. The development plan, on the other hand, is a generally applicable municipality regulation. The Code of Municipality Planning mentions the subject of non-statutory planning but does not define the content and form of informal plans. Their content is to result from an integrated approach to planning. The general objectives set out in the Code relate to the land/land use plan and non-statutory (informal) plans. Planning should balance public and private interests as part of the implementation of socially just land management and foster the creation of decent living conditions [6,25]. Cities/municipalities conduct a policy of socio-economic development based on a land use plan.

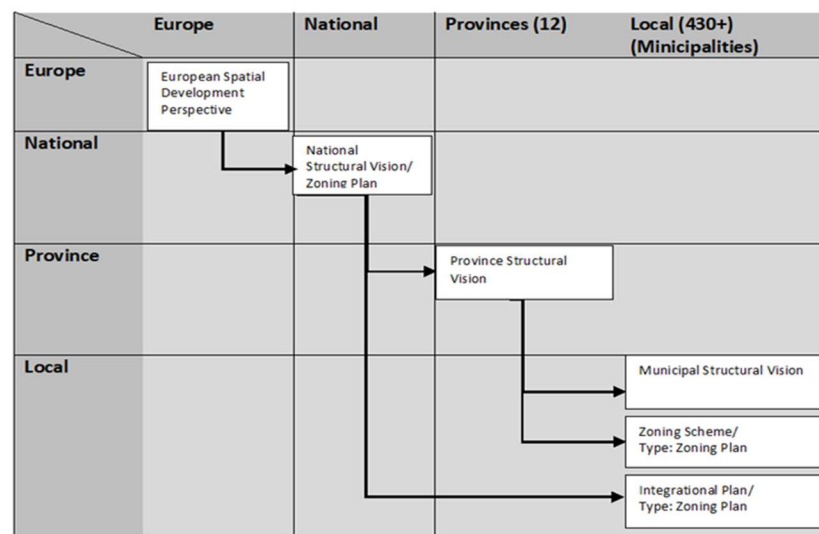


Figure 2. The Dutch spatial planning system: levels and instruments. Resources: Own compilation based on Schrenk, Neuschmind, and Wasserburger [16].

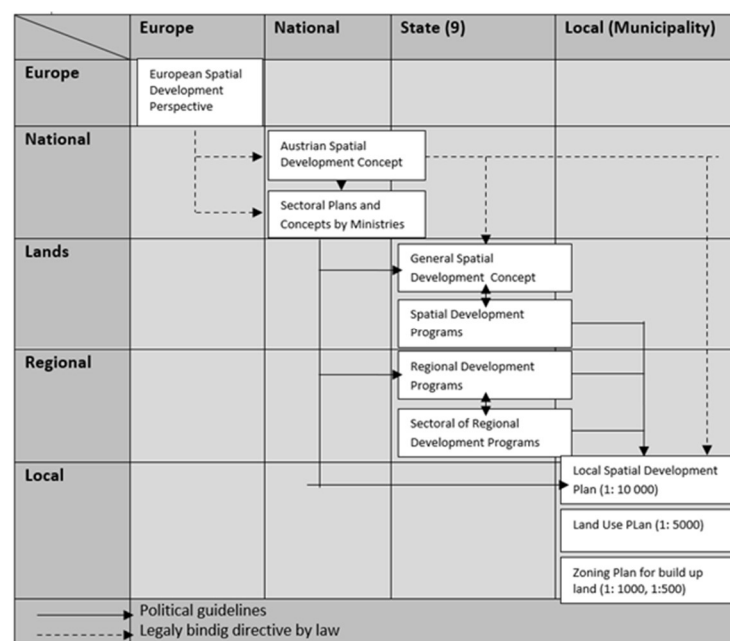


Figure 3. The Austrian spatial planning system: levels and instruments. Resources: Own compilation based on Schrenk, Neuschmind, and Wasserburger [16].

2.2.4. Spatial Planning Acts Versus Location Decisions in Poland

Poland now has the best chance of choosing the right model of spatial planning and development system at a time when more and more researchers see the relationship between the new strategic approach to development planning, ‘integrated planning’, and the creation of a SDI in Europe. In 2011, there were 21 different types of spatial policy instruments in force in Poland (See: Supplementary Materials: Table S1). By 2020, another two types of special decisions have been added.

Spatial planning in Poland has been criticized by many researchers (planners, town planners, lawyers, geographers, and surveyors) (see: Supplementary Materials). The new type of planning document introduced after 2003, mentioned in the ‘study’, did not prove to be an effective document of spatial policy because the regulations did not explicitly specify the obligation to apply it to issuing location decisions. Additionally, there are several different types of location decisions. There would be nothing extraordinary about

that if such decisions were issued sporadically, but in Poland, over 51% of residential investments are made based on location decisions, which constitute the largest investment micro-pressure in Poland (See: Supplementary Materials: Interview 4). Similar decisions function in some planning systems in France, but they seem to be very few compared to the scale of Poland. In addition, there are several other types of decisions in Poland, the so-called ‘special decisions’ regulated by separate acts. These decisions are very privileged and replace four types of decisions: decisions on building conditions and land development, decisions on the building permit, decisions on the division of real estate, and the decisions on the use permit. In the literature on the subject, there are many articles describing research on the effects, including the financial effects, of spatial chaos in Poland [26–33], as well as various attempts to determine the operational directions of planned land use sets, mainly in the field of sub-local zoning plans [27,28]. Unfortunately, in the literature on the subject, Poland ignores the issues related to existing land use databases within the meaning of the INSPIRE Directive (See: Supplementary Materials: Interview 3 and 10).

From the latest publications, for example, P. Śleszyński, A. Kowalewski, T. Markowski, P. Legutko-Kobus, and M. Nowak [29] write about spatial chaos, W. Izdebski [30] and W. Łachowski [31] write about the dissemination of network services, and the issue of public services in research with the use of spatial analyses is described by K. Heffner and P. Gibas [32]. Moreover, P. Gibas, K. Heffner, P. Śleszyński, P. Gibas, and P. Sudra describe the results of research on a related but completely different database—‘Land Cover’ [33]. Every year, the Ministry carries out analyses of the state of spatial development carried out annually by a team led by P. Śleszyński. The methodology is modified from year to year. The analysis of the conditions of planning work in municipalities for 2017 showed that there are still municipalities that do not have a ‘study’, and still less than a third of the country is covered by sub-local zoning plans. The number of decisions on development conditions is increasing, and landscape resolutions are slowly introduced. Additionally, a stagnation of planning works is observed. One third of municipalities carry out a procedure of partial or complete updating of their ‘studies’. Almost 30% of the documents of the study of conditions and directions of spatial development are analogical.

Regarding designers and practitioners with extensive experience, K. Guranowska-Gruszecka, an urban architect, contrasted the planning system in France with Polish systems [34], and the designer, communication expert P. Pecelik [35], explains the differences in the functioning of both systems. K. Romańczyk writes about the paradoxes of urban planning in the context of the exemplary Polish city of Krakow (the second largest city in Poland after the capital), including in the context of its location in a post-communist country [36], and the first translates mpzp (spatial development plan) more accurately into English as a ‘sub-local zoning plan’. The problem arises primarily from a defective law, including the basic Act on spatial planning and development of 2003 [37]. The greatest paradox is that the ‘study’ is not recognized by the Act [36,37] as the obligatory municipality authority to issue decisions. Figures 4 and 5 show the investment micro pressure in the form of the number of decisions on development conditions. Moreover, although sub-local zoning plans should remain fundamental tools in delivering specific criteria of urban planning, municipalities are not obliged to apply them. As a consequence, for example, only 136 local zoning plans, which cover 48.9% of the city space (Figure 6), have been applied in Krakow as of 2016. Figure 7 shows a slight increase in sub-local zoning plans in 2021. If there is no sub-local zoning plan for a designated area, a municipal clerk can issue a planning permit that allows a construction project to begin. Between 2003 and 2015, almost 45 thousand such permits were granted in Krakow [36]. Even if new sub-local zoning plans are approved, they are not able to prevent the negative effects of already executed permits.

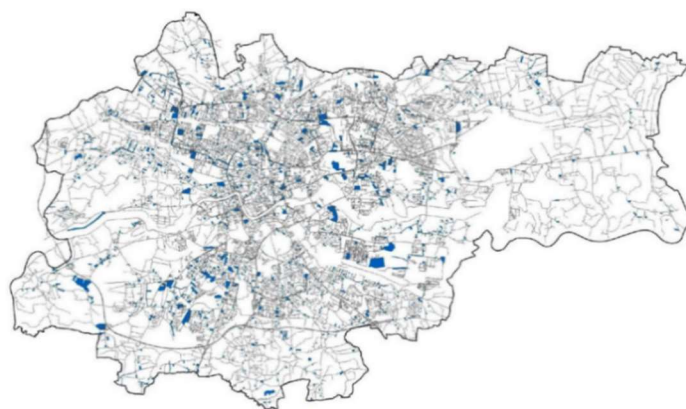


Figure 4. Map of binding location decision on building conditions as of 2003–2004. Resources: Bujakowski K. *IV Ogólnopolskim Sympozjum “INSPIRE”*, Kraków, 31 May 2010.

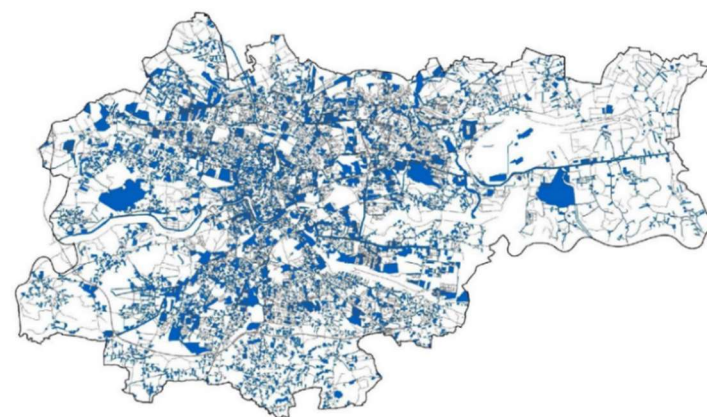


Figure 5. Map of binding location decision on building conditions as of 2003–2008. Resources: Bujakowski K. *IV Ogólnopolskim Sympozjum “INSPIRE”*, Kraków, 31 May 2010.

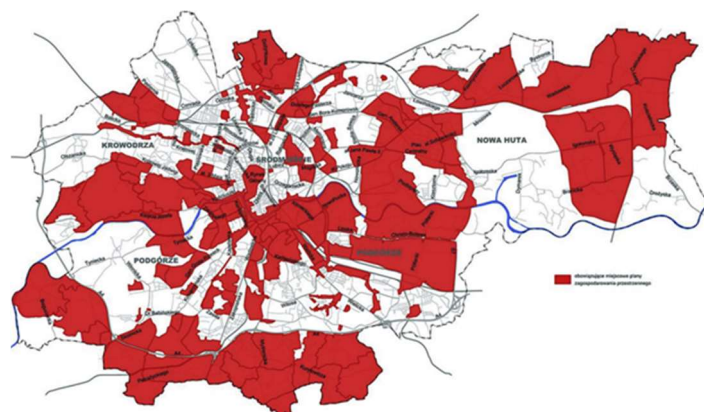


Figure 6. Map of binding sub-local zoning plans (red color) as of 2016. Source: Romańczyk K. [32] and Krakow City Council, http://planowanie.um.krakow.pl/bpp/plany_obow.htm (accessed on 21 July 2021).

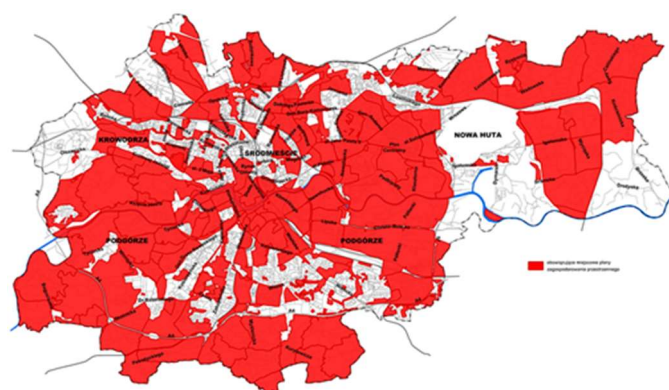


Figure 7. Map of binding sub-local zoning plans (red color) as of 2021. Source: Krakow City Council, https://www.bip.krakow.pl/?dok_id=119734 (accessed on 20 July 2021).

The greatest impact on the justification of the author's thesis, apart from the first guidelines of J.M. Chmielewski [4,5] about the German land use plan, was exerted by the publication of A. Tölle [6], which perfectly explains what integrated forms of planning and managing local development are in the context of the selection of appropriate planning studies by comparing the Polish system to the German system.

3. Material and Methods

In an interdisciplinary approach to the topic, the author uses her extensive professional experience, including as the author of many architectural and urban projects, planning acts, and work as a construction supervision expert at the Main Office of Construction Supervision 2000–2010, as well as in a local government unit (implementing the Geographical Information System for the needs of the City Hall Warsaw). The qualitative research consists of an analytical and an empirical part.

For the purposes of the research, it was assumed that spatial planning is a special case of management and not an activity undertaken during management. Such an assumption is even more justified as the new approach to strategic development planning requires its integration with spatial planning and presenting the spatial management of a given territory in a more holistic manner. In the thesis, in this sense, the term 'spatial management' was used, which refers to local, subregional, and regional spatial planning.

In the first stage of the research, in 2011–2013, in literature on the subject, the INSPIRE technical guidelines were analyzed; interviews with INSPIRE experts (Prof. Z. Parzyński, Prof. D. Dukaczewski, and Prof. A. Głazewski) and land use and spatial planning experts (Supplementary Materials). A case study of activities undertaken in a planning unit at the regional level in the Lower Silesian Voivodeship was conducted.

After the analytical research stage, the author applied in 2011 to the Surveyor of the Mazowieckie Voivodeship to provide the first public procurement in Poland concerning standard data models for planning studies for the Mazowieckie Voivodeship [8], [Supplementary Materials: Context]. The author presented her reflection based on the analysis of this public order in the publication "The role of geoinformation in the field of cooperation of local government units with entrepreneurs" in 2016 [8]. In this part of the research, it should be added that with regard to the aforementioned public procurement, in a different approach to the subject, the analysis of the order of the Office of the Surveyor of the Mazowieckie Voivodeship was carried out at the end of 2011 by P. Malczewski. The presentation with the results was posted on the IGPiM website in 2013 [37]. The author of this article adds that hierarchical coherence of planning studies and other documents determining spatial development should be brought about, the terms 'plan' and 'planning document' should be defined in the regulations, and in the National Metadata Profile for the topic spatial development, the cause-and-effect relationships between planning studies and the above-mentioned decisions should be described. The author of this article confirms after P. Malczewski the lack of justification: "Vectorization of an obligatory resource in order

to bring it into an enabling form inclusion in the IIP resource as datasets at the level of object classes, due to the use of non-standardized reference objects to create these documents". In view of the above, the conclusions contained in the development of a harmonization strategy at the level of land use are based on a pilot project in municipalities for the harmonization of sets, metadata, and data services (UNEP/GRID Warszawa) [38], in which this principle is not proposed. Summarizing the author's analysis, due to the defective legal status, including the lack of a definition of a planning plan/act and the lack of a hierarchy between spatial planning documents/acts functioning in Poland, the contractor had a problem with the interpretation of relationships in the application scheme metadata profile between planning acts (the author received a legal analysis from the Mazovia Voivodeship Office, prepared especially for the needs of the public procurement). Importantly, the problems of spatial data resulting from numerous types of location decisions were not indicated in the order. Each of the Polish planning documents/acts is a completely different type of plan, so in their current form, it was not possible to combine them in one zone model. The voivodeship structure plan has a completely different scale and accuracy compared to the plans of the local level. The conclusions of this analysis contributed to the preparation of a questionnaire addressed to various specialists. The author discussed her doubts about the new INSPIRE guidelines regarding PLU in the context of an urban planner's workshop with town planners, and, at the same time, theoreticians from my home university the Faculty of Architecture of the Warsaw University of Technology with urbanists and professors S. Gzell, J. M. Chmielewski, and K. Guranowska-Gruszecka. The author compiled all 21 types of documents determining spatial development in Poland [6], (Supplementary Materials: Table S1).

Then, the author participated in training for local governments, implementing the INSPIRE guidelines in 2011, during which specialists on these issues (G. Rachwał from the RDEP in Rzeszów and P. Malczewski from Institute of Territorial Development in Wrocław), on 1 June 2011, submitted comments to the first questionnaire, which was then passed on to participants of the training next day on 2 June 2011. Furthermore, it was very important to learn about new GIS technologies as well as the principles of building relational databases and UML (Unified Model Language) modeling. The author participated in special classes on the subject of Geographical Standards in the academic year 2011/2012 at the Faculty of Geodesy of the Warsaw University of Technology with Professor Z. Parzyński [2,7].

The illustrations and figures of case studies in planning units at the regional level presented in this paper were prepared based on materials, with data provided by the Institute of Territorial Development in 2011 in Wrocław (P. Malczewski). Figure 8 below shows problems with the analysis and integration of graphic attachments regarding 'municipality studies' in the Lower Silesian Voivodeship, covering the area of the entire municipality (two illustrations on the left, top and bottom) to prepare a Spatial Development Plan of the Lower Silesian Voivodeship. Figures 9 and 10 present the activities undertaken by the planning unit aimed at trying to monitor changes in spatial development, using the example of the municipality of Katy Wrocławskie. Already at the initial stage, it was found that there are no data and information for such monitoring.

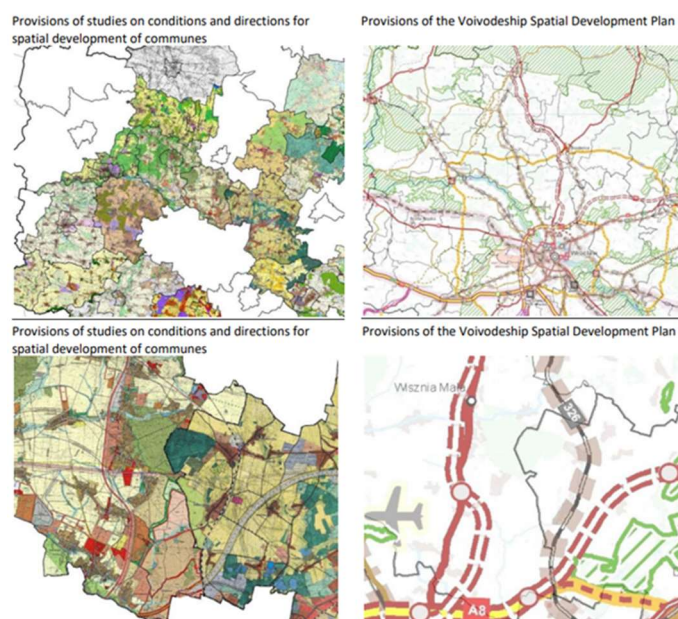


Figure 8. Provisions of municipality studies and provisions of The Voivodeship Spatial Development Plan. Resources: P. Malczewski, Institute of Territorial Development.



Figure 9. Comparison of aerial photographs of the Urban Atlas database. Resources: P. Malczewski, Institute of Territorial Development in Wrocław.

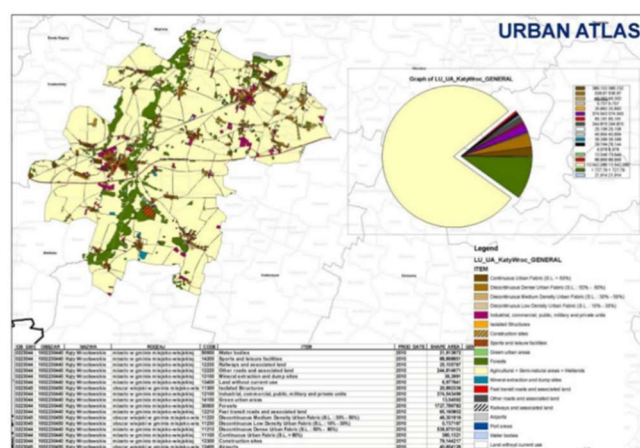


Figure 10. Area of residential areas AU = 964 ha (5.5% of the municipality area). Resources: P. Malczewski, Institute of Territorial Development in Wrocław.

The unification of the legend and functional zones of the "Study" of the Katy Wroclawskie municipality into the Urban Atlas database (ELU type) will make it possible, from a certain point, to monitor comparable zones and show trends of changes. This is shown in Figures 10 and 11. The legend text of Figure 10 is on the right side of Table 1 and the legend text of Figure 11 is listed on the left side of Table 1).

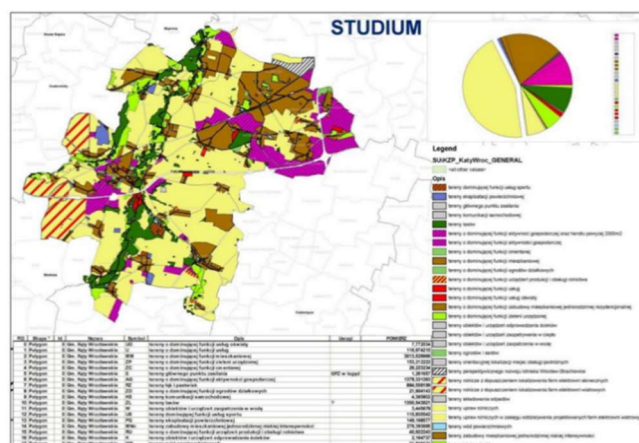


Figure 11. Area of SUiKZP residential areas = 3296 ha (18.7% of the municipality area). Resources: P. Malczewski, Institute of Territorial Development in Wrocław.

In the second stage of research in 2017–2019, two empirical qualitative studies were carried out, including one together with a team: (1) a questionnaire survey addressed to three units of 16 marshal offices and (2) a study by the author of the article, a case of activities undertaken in a planning unit at the regional level in the Pomeranian Voivodeship. The justified need to continue the research resulting from the first stage of research and the need to search for new models of strategic development in Poland, which would integrate socio-economic planning with spatial planning, signaled by town planners and practitioners, prompted the author to decide in December 2016 to undertake the second stage research in 2017–2019, to which representatives of other universities were invited. It was planned to collect more views from other users of the datasets in question as part of the regional research.

The author, together with representatives of other scientific disciplines, including specialists in economics and strategic management and foresight specialists, intended to strengthen both research theses, both about the need to hierarchize spatial policy instruments and to establish a new type of planning tools. At the end of 2016, the author

invited representatives of other disciplines (M. Pękalska from the Warsaw University and P. Bartoszczuk, D. Brodowicz of Warsaw School of Economics [39]) to cooperate [40,41]. Regional research was planned, extending the group of IIP users to include marshal offices. Moreover, the need to undertake research also resulted from market and theoretical problems signaled by practitioners and scientists dealing with spatial planning. The co-authors described the preliminary results of research, in-depth interviews, and analyses of portals of marshal offices, including regional territorial observatories in a publication from 2017. The genesis of the creation of Regional Territorial Observatories on the example of the Małopolskie Voivodeship was presented in the publication contained in the KPZK Bulletin in 2017 [40,41]. The aim of the research was to assess the current access to reliable, complete datasets on spatial development at the regional level, as well as other information and data on socio-economic phenomena, including comparable spatial policy for each voivodeship, which is needed by many users, including for monitoring support, and which is an integral element of the country's development. The second goal of the research was to look for inspiration for new ways of strategic programming, stimulating the development of the region, using the potential of sharing integrated data: spatial and descriptive on portals of marshal offices. The following research questions were asked in this way for the purposes specified: Is the new approach to strategic planning related to the emerging Infrastructure for Spatial Information? Do foresight experts, planners, entrepreneurs, and investors have access to reliable descriptive and spatial data related to the region's potential or investment pressure? Are actual changes in land development monitored? Is the descriptive information related to the infrastructure nodes (wms, wfs web services for viewing datasets)? Are complete datasets on spatial development conditioned by the needs of users available within the regional IIP nodes? Is the potential of the Infrastructure and Regional Territorial Observatories being fully used in Poland? The questionnaire for marshal's offices was divided into three parts, and each of them had separate questions addressed to three different units: A—Departments for Spatial Information Infrastructure, B—Spatial Planning Office, and C—Regional Territorial Observatory. Out of 16 voivodeships, 14 responded in writing to the questionnaire by 30 August 2017.

The last empirical study, a case study carried out by the author in 2018, concerned activities undertaken by a planning unit at the regional level in the Pomeranian Voivodeship as part of three meetings at this unit in Gdansk. The author was interested in where this unit retrieves the necessary data for monitoring changes in spatial development, as well as about other phenomena. Here, the author was acquainted with the very good practice of coping with these difficult conditions of a lack of information. Creative employees and planners have developed a geo-questionnaire, based on which all municipalities from the entire voivodeship, according to uniform rules, enter on an interactive geo-map all construction investments, from the smallest to the largest, that are implemented in the voivodeship. These activities confirmed that there is a very high demand for spatial data on land use changes and, due to the lack of access to data, they become necessary. More detailed analyses necessary to create the Gdansk—Gdynia-Sopot Metropolitan Area Plan were commissioned to an external company.

As a summary of the research results, the author created her own preliminary model: 'Spatial planning in an integrated development policy in Poland' containing a model for integrated planning of the local level developed jointly (as part of several meetings in 2018) at the Society of Polish Town Planners, Warsaw Branch, collected in the diagram by M. Świetlik and J. Pietruszewski's suggestions referring to planning documents of the regional level. The guidelines for integrated planning, an elaboration jointly with the Association, were submitted to the Ministry of Development. The results of research in 2019 were presented in the article [18]. During her research stay at the Polytechnic University of Catalonia UPC Barcelona (Spain), the author learned more about the spatial planning system in Spain, explained to her by Prof. Rolando Biere Arenas and Prof. Carlos Marmolejo-Duarte in June 2019. As in the Pomeranian Voivodeship, here attention was also paid to a very complex and specific coastal region, which requires detailed spatial

plans. Before writing this article, the author became acquainted with the legal status in Poland, reviewed the literature again, and then made a self-correction of her model.

4. Results

4.1. Author's Analysis of Technical Guidelines Inspire for Land Use

According to the Directive, the subject (datasets) 'spatial development' is understood as "the territory characterized in terms of the current functional dimension and the planned functional dimension or the socio-economic purpose of the area resulting from planning documents". In accordance with the Polish Act of 4 March 2010 on spatial information infrastructure [8], "spatial development, understood as land development, in its present or future functional dimension, or the socio-economic purpose of the land, including residential, industrial, commercial, agricultural, forestry, holiday, resulting from planning documents". Both in the definition of the Directive and in the details of the specification, two metadata profiles are mentioned: ELU and PLU. Perhaps that is why the issue of ELU classification in Poland is omitted in public procurement, research, and articles [41,42]. Figure 12 below shows two application schema metadata profiles for ELU and PLU that should be developed in each EU country.

			Existing Land Use	Planned Land Use
			dzisiaj	
			Odniesienie czasowe	
			Existing LU [Istniejące]	Planned LU [Planowane]
Geometria	Wektorowe Dane	Poligony	ELU	
		Poligony, linie, punkty		PLU
		Punkty (zbiory lokalizacji)	SELU	
	Rastrowe dane (Gridowe)		GELU	PLU

Figure 12. ELU and PLU with the corresponding application diagrams. Resources: Stelmach-Fita [7].

Figure 13 below shows a comparison of the adopted uniform Hierarchical INSPIRE Land Use Classification System (HILUCS) in the previous and final versions.

Comparison of the previous and final versions of HILUCS.

HILUCS level 1 PREVIOUS VERSION	HILUCS level 1 FINAL VERSION
1_Agriculture	1_Primary Production
2_Forestry	2_Secondary Production
3_Mining And Quaring	3_Tertiary Production
4_Aquaculture And Fiscing	4_Transport Network Logistics And Utilities
5_Other Primary Production	5_Residential Areas
6_Industrial Areas	6_Other Uses
7_Services	
8_Network And Basis Infrastructure	
9_Residential Areas	
10_Abandoned Areas	
11_Natural Areas Not in Use	
12_Construction Areas	
13_Not Known	

(a)

(b)

Figure 13. Comparison of the previous and final versions of HILUCS: (a) HILUCS, Level 1, the previous version, because it contained more class attributes, it seemed more understandable, and it contained construction areas, Natural Areas Not in Use and Not Known. (b) HILUCS, Level 1, the final version, is very simplified and therefore may not seem to be understandable. However, the presentation of datasets from all countries on the European website require it.

The national classification is optional. The requirements of this specification apply in the European service [42,43], [Supplementary Materials: Interview 3 and 10]. The author confirms the need to create a uniform classification of ELU and PLU because only both sets allow the monitoring of changes from a specific point in time (but on a high level of generality—the level of the municipality). The specification on land use describes zoning plans showing significant differences between (1) regional level structure plans, (2) zoning plans, and (3) a more detailed sub-local level. The Polish ‘sub-local zoning plan’ is a kind of ‘hybrid’ between zoning plans and German spatial development plans. Moreover, sub-local plans are not required to be made available at the European level [42,43], [Supplementary Materials]. The national individual countries provide the ELU and PLU datasets on national and European services. The datasets made available on the European website must meet all the requirements of the land use specification. The HILUCS classification applies to the European website. This means that if a given country, such as Poland, has not established a national, local classification, it may develop it for its own needs, but it does not have to. INSPIRE does not require collecting new data. However, after the deadline set in the directive, EU countries must provide their data according to the implementing rules. It may be that to be fully compliant with the guidelines, the existing resources need to be transformed and supplemented, and in some cases, the missing components must be acquired. These very important issues are highlighted by Rossa, Gogolek, and Łukasiewicz [44]. Furthermore, after analyzing the English and Polish versions of the specification, attention is drawn to the crucial issue of translating the term ‘cadastral maps’. In the drawing diagram, this term has been translated as the ‘Land and Building Register’ (EGIB in Polish), for which there are reference datasets for the creation of sub-local zoning plans. There are no typical ‘zonal cadastral maps’ in Poland. In the Geodetic and Cartographic Law of May 17, 1989 [45], in accordance with the provisions of Art. 53, until the land and building register is transformed into a ‘real estate cadaster’, the term cadaster used in this Act shall be understood as this register (EGIB). This provision proves that in Poland there are no such cadastral maps as are found in other countries and which were included in the specification. In the author’s opinion, the Polish version should also be faithfully translated as ‘cadastral maps’. The differences are shown in Figure 14. Moreover, the term cadastral maps is understood differently in each country, sometimes as names of land use classes and or as a land/plot ownership map (Austria).

Interpretative doubts: English and Polish versions of specification.

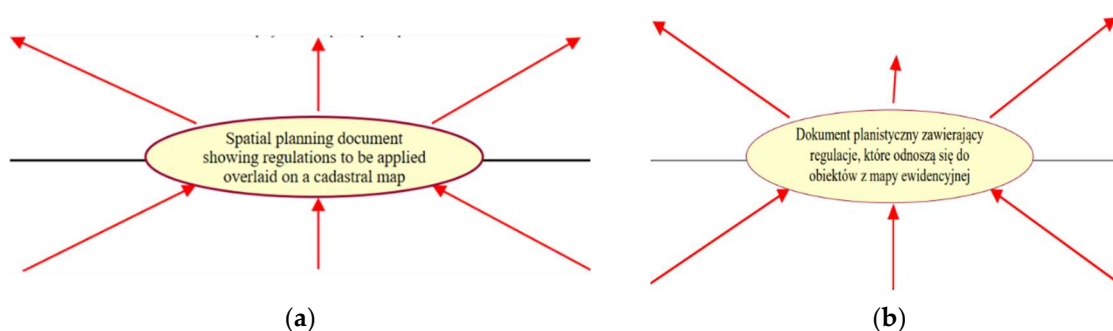


Figure 14. (a) English version. The faithful translation in Polish should be: ‘A spatial planning document showing the applicable regulations imposed on the cadastral map’. (b) Polish version: A planning document containing regulations, which relate to the objects of the ‘Registry map’ (in Poland, it is the ‘Land and Building Registry’, not a cadastral map).

Furthermore, it should be underlined that the HILUCS classification is uniform for the ELU and PLU sets. However, not all categories are common to both collections, while ELUs include the categories of transition areas and areas under construction, the planned spatial development datasets do not contain such categories. The analysis of common and reserved categories for one of the two collections showed that two metadata profiles for ELU and PLU should be developed in Poland. Users need actual spatial data about the location,

location of issued building permits, or special decisions regarding the construction of line investments of provincial and national importance. These issues require further discussion.

4.2. *The Empirical Part 2011–2013*

4.2.1. The Survey Aimed at Key Specialists and Experts—2011

The study was described in Supplementary Materials. 30 specialists answered the survey in total. This study is part of the study “Assessment of public access to data on the data theme land use of the INSPIRE Directive in Poland”. The assessment examines the access to spatial data from the user’s point of view and the related issue of quality and completeness of the shared datasets. The starting point for the assessment were the interviews of experts, and the main research goal was to identify the most important needs and limitations from the user’s point of view regarding the provision of comparable, complete data on spatial development, along with an indication of recommendations for significant directions of activities aimed at harmonizing spatial datasets in the discussed topic. The study was aimed at gathering knowledge in a new field so that it was possible to outline directions for solving the difficult problems described in the report.

The results of the survey confirmed the problems with defining the data theme ‘land use’ in Polish conditions. Moreover, they proved the ineffectiveness of the functioning planning documents. Therefore, sharing only these documents in IIP will not meet the quality and completeness criterion of IIP determined by the needs of users. The selection of a planning document to be made available at the European level is also problematic, and at the same time, it requires meeting the guidelines of the technical specification ‘land use’. The thesis about the need to establish a new type of plan or to strengthen the current ‘study’ was justified in such a way that the municipality authorities were binding when drawing up plans and issuing decisions. Making such a plan available at European level would solve the problem of the lack of a land use dataset at European level. Two metadata profiles should be created for: I—existing Land Use; II—Planned Land Use.

4.2.2. Case Study of Activities Undertaken in a Planning Unit at the Regional Level in the Lower Silesian Voivodeship

The materials provided were the result of analytical work on the project of the Wrocław Metropolitan Area on the subject of “Assessment of the spatial policy of municipalities” from the sub-regional level. The indirect goal was to obtain development indicators of individual municipalities in the context of metropolitan development. Such indicators would allow the municipality authorities to conduct a coherent and integrated spatial policy in terms of common metropolitan tasks and to conduct a more effective mutual policy, well-understood competitiveness. All these activities are to contribute to a more rational and coherent use and development of space in the entire area. The main assumption of the analytical work was the use of past, present, and future land use data as well as statistical data from a specific time space. Already at this stage, conclusions were drawn about the very little data available in terms of conducting continuous monitoring. This type of analysis requires the identification of trends for a given issue and a given area, as well as the location on the scale of the municipality. For this purpose, constant monitoring of changes in space is necessary. Preliminary work was started based on the Urban Atlas database, as it was assessed that it was sufficiently precise to define the state of land use and is intended to be updated. It was not yet a sufficient attempt to speak of effectiveness; nevertheless, it provides grounds for formulating certain model principles in the approach to forecasting the effects of the findings of planning documents and changes in land use. The UA is the standard for ‘existing land use’. The database is available in the WMS service. Based on the available materials, the generated generalization of the planned land use value from the planning document of the ‘Study of Conditions and Directions’ of the Katy Wrocławskie Municipalities was compiled and translated into English. Moreover, UA is compatible with HILUCS; it is described in the land use specification. This classification includes the most

necessary and understandable method of naming and recording the existing conditions, including ELU, for planners in the scale of the entire city and the metropolitan region.

Research on the creation of a uniform, national classification of land use should be continued, using the previous experience of activities undertaken in planning units at the regional level in Dolnośląskie and Pomorskie voivodeships, concerning the standardization of LU in the field of harmonization of PLU zones ‘study’ with the classification of the ELU Urban Atlas database (See: Table 1).

Table 1. PLU of Kąty Wrocławskie harmonized with UA and HILUCS.

The Directions of Spatial Development from the ‘Study’ (Suikzp) Harmonized in UA English	Urban Atlas
Areas with the dominant function of sports services	Sports and leisure
Areas of surface exploitation	Mineral extraction and dump sites
Main point of electro-magnetic power	Isolated structures
Car communication areas	Other areas and associated land
Forest areas	Forest
Areas with the dominant function of economic activity and trade >2000 m ²	Industrial, commercial, public, military, and private unis
Areas with a dominant economic function	Industrial, commercial, public, military, and private unis
Areas with a dominant cemetery function	Green urban areas
Areas with a dominant residential function	Discontinuous medium density urban fabric
Areas with the dominant function of allotment gardens	Green urban areas
Areas with a dominant function of agricultural production and service equipment	Agricultural, semi-natural, and wetland areas
Areas with a dominant service function	Industrial, commercial, public, military, and private unis
Areas with the dominant function of educational services	Industrial, commercial, public, military, and private unis
Areas with a dominant function of single-family residential housing	Continues urban fabric
Areas with a dominant function of arranged greenery	Green urban areas
Areas of facilities and devices for sewage disposal	Industrial, commercial, public, military, and private unis
Areas of facilities and equipment for supplying heat	Industrial, commercial, public, military, and private unis
Areas of water supply facilities and devices	Industrial, commercial, public, military, and private unis
Garden and orchard areas	Agricultural, semi-natural and wetland
Areas of indicative service of passenger service areas	Industrial, commercial, public, military, and private unis
Areas of prospective development of the Wrocław–Starachowice airport	Industrial, commercial, public, military, and private unis
Agricultural land with the possibility of locating solar farms	Agricultural, semi-natural, and wetland
Agricultural crops within the impact range of the designed wind farms	Agricultural, semi-natural, and wetland
Surface water areas	Water
Low-intensity residential development areas	Discontinuous low density urban fabric
Areas of meadows and pastures	Agricultural, semi-natural, and wetland

Resource: Own study, B. Stelmach-Fita.

Because both classifications, Urban Atlas and HILUCS, are consistent with each other, and a uniform nomenclature for the entire area of municipalities is most needed at the regional level to monitor changes, it may be good practice to adopt the UA classification as a starting point for creating an ELU database in each municipality harmonizing the LU legends with the current ‘study’ (suikzp). This level of detail is sufficient to make the databases available on the European website. The datasets corresponding to 1:25,000, or a LUCAS database that complies with all standards, are recommended for use.

4.3. Empirical Part of Research—2017–2019

4.3.1. A Questionnaire Survey Addressed to 16 Marshal Offices in Poland—2017

The survey was addressed to three units labeled A, B, and C. Responses from 14 voivodeships have been compiled for them separately. The results of the questionnaire addressed to the units, confirming the thesis, are presented below.

A—Departments for Spatial Information Infrastructure

1. Does the regional SDI node include the voivodeship development plan?

The question stipulated that it does not concern the provision of plans on the BIP website. Out of 14 voivodeships, five indicated that the plan was made available in the IIP node. In other provinces, the PZPW is available on the website of the Public Information Bulletin. In some cases, the plan consists of several graphic and text attachments. When asked what the reason is for not making the PZPW available under the IIP, the majority of as many as 70% indicated the lack of regulations (35%) or guidelines of the leading bodies (35%). The regulations are not clear where the voivodeship development plans are to be published, whether on the BIP or on the geoportal [Figure 15].

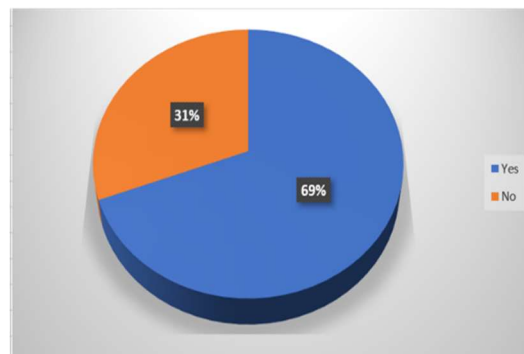


Figure 15. Answers to the first question of Unit A. Resource: own study.

Furthermore, regarding Lower Silesia, there are no provisions regarding the competences and rights of the marshal to share data contained in voivodeship plans, coming from many sources.

2. Does the regional SDP contain decision location maps in services: wms, wfs?

There is no clear regulation on whether to provide decision location maps or not [Figure 16]. Mazovian, as the most digital voivodeship in Poland, will publish such maps in the form of hybrid solutions. Provides a URL link to the decision location maps. These issues require a resolution, especially now when the regional SII nodes are implemented in several voivodeships. Most of the offices believe that decision datasets should be made available.

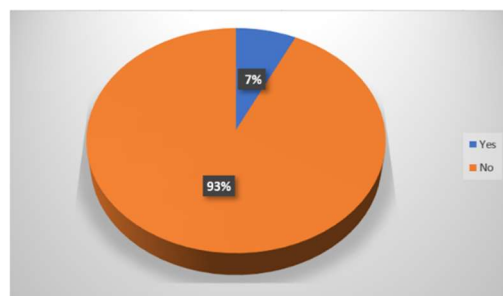


Figure 16. Answers to the second question of Unit A.

3. Does the regional SDP node contain other datasets?

Most believe that other data sets should be made available as well, but one province explains that copyright regulations are needed [Figure 17]. One voivodeship will make available various datasets that will be created.

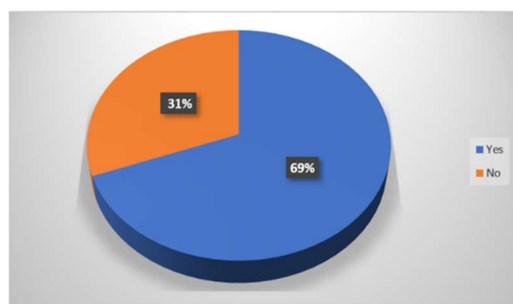


Figure 17. Answers to the fourth question of Unit A.

4. Could the Marshal's Office provide SDP for the needs of the Voivode's Office for the collection of locations of decisions issued by the Voivode when establishing legal regulations?

There are technical and technological possibilities to provide location map data sets created by the Voivode within the Marshal's infrastructure nodes, which is why as many as 86% responded positively [Figure 18]. However, even if the Voivode decided to provide URL links with decision location maps, in accordance with the SDP guidelines, he should make the collections available as their author, responsible for the content and description.

B—Spatial Planning Office

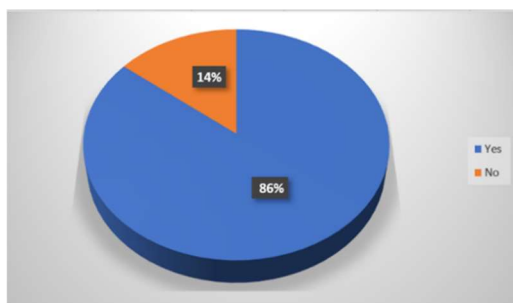


Figure 18. Answers to the fourth question of Unit B.

1. Are decision location maps needed in the Marshal's registers, available in the WFS, WMS, and SDP network services to update the PZPW (PZPW—this is the acronym of the name of the Voivodeship Development Plan)?

The question contained four types of decisions issued by the governmental body.

All of the offices replied that the decisions issued by the Marshal are needed to update the voivodeship development plans and therefore they need to be made available through network services such as WMS and WFS. This would make the work of designers easier and reduce the costs and time consumption of their processing.

2. Do you need to update the PZPW with decision location maps from the Voivode's registers as available in the form of network services?

The question contained eleven types of decisions issued by a government body. All offices replied that the decisions issued by the Voivode are needed to update the voivodeship development plans and therefore should be made available through network services such as WMS and WFS.

3. Do you use cooperation with ROT (ROT—this is an acronym of the Regional Territorial Observatory) to update/create a new PZPW for the purposes of spatial analyzes, e.g., in the field of collecting information?

The planning units generally benefit from cooperation with ROT, especially in the field of information collected in the field of: location of economic zones, location of enterprises, and in the case of Mazovian Voivodeship also databases such as raw materials, national parks, nature reserves, landscape parks, areas of protected landscape, Natura 2000 areas, water and sewage management, airport infrastructure, transport, logistics, rail and road transport, agricultural area in relation to the total area of the municipality, length of the gas network, etc.

4. Should decision location maps issued at the local and voivodship level be made available to investors, entrepreneurs, entities agreeing, giving opinions or other users?

Mazovian: If the above-mentioned collections/maps are created, there are no contraindications to share them. This will allow better information on spatial planning processes and should speed up the decision-making process. In addition, the maps of the location of the decisions will be of illustrative and informative value for the interested entities. Sharing data streamlines the investment and administrative process and fulfills the obligation resulting from the Act of 6 September 2001 on access to public information. Therefore, in the author's opinion, as part of hybrid solutions, links from portals of marshal offices could lead to network services to decision-making units and creating their registers.

The Masovian Voivodeship has become the most digital region, as the first public procurement for standard data models for planning studies was carried out here. All experiences have been put to good use here.

4.3.2. Case Study of Activities in a Planning Unit at the Regional Level in the Pomeranian Voivodship

The results of the study were published in an article in 2019. The most important conclusions from this part of the research, strengthening the justification of the two theses, concern problems with the design of linear investments due to the large number of decisions issued on development conditions. Even the best technologies and four variants of roads designed in GIS will not help if decisions are still issued. Moreover discussions showed that integrated planning is a process, in which territorial dialogue plays a significant role. In the opinion of the author, however, this unit takes matters into its own hands and takes valuable actions to create a territorial dialogue and forecast future trends for the entire voivodeship. A very good practice in the current legal situation is the initiative to develop a geo questionnaire collecting spatial data on all investments from all municipalities from the entire voivodeship. The questionnaire was designed in an exemplary manner and made available as an interactive map for municipal officials and thus they enter all the data according to the instructions. But then what was the point of creating an SDI in Europe?

4.3.3. Analysis of the Legal Status, Model Self-Correction

At the stage of writing the article in August 2021, the reform of the planning system had not yet been completed. Even though the changes are going in the right direction and the minimum requirements of INSPIRE have been met regarding the provision of non-uniform datasets in the field of planned land use, the problem of the lack of many spatial data related to spatial development has still not been resolved. It is still difficult to monitor changes in this area.

Regarding the fulfillment of the minimum INSPIRE guidelines in the current legal status pursuant to Art. 67a sec. 1 of the Act of 2003 on spatial planning and development [34] in Poland, the authorities competent to prepare draft acts referred to in para. 2 create and maintain, including updating and sharing, spatial datasets within the meaning of art. 3 point 11 of the Act of 4 March 2010 on spatial information infrastructure [10], hereinafter referred to as 'collections'. Datasets include:

- voivodeship spatial development plans, including spatial development plans for the functional urban area of a voivodeship center,
- framework studies of the conditions and directions of spatial development of the metropolitan association,
- studies,
- local plans,
- local reconstruction plans,
- local revitalization plans.

It should be emphasized that there is still no definition in any act of what is a ‘planning document’ or ‘planning act’, and even less on the new concept, ‘act’. On the other hand, a local revitalization plan is a special local plan.

The Concept of the Spatial Country (Poland) was abandoned in Poland. This document will be linked to the strategy. Even if the amendment to the Act of 2020 amending the Act of 2006 on the principles of development policy introduced new types of integrated documents, and in them a new type of strategic document ‘medium-term national development strategy’, some graphic replication should be found in its scope and form the existing development (conditions—ELU) and planned (directions), which should be made available in the IIP along with the range of Polish borders in the agreed form. The Act on the principles of the development policy and other acts does not contain any delegation to the regulation that would detail these issues.

There have been recent consultations on a new type of plan, but the details are vague on whether it will be a typical local general plan, applicable to all citizens, or a kind of zoning scheme that will be obligatory for municipal authorities to draw up plans and issue decisions. Selected issues regarding the selection of types of plans, differences between development strategies and plans, and the issues of their attempts to connect in Poland were discussed by the author on 28 June 2019, in Barcelona, with three professors of that university, including Prof. R.M. Biere Arenas (2019). Since 1956, the legal system of Spain has been dividing land into three classes (I—intended for urbanization, II—possible urbanization, and III—not for urbanization). It should be emphasized that, in Spain, there are nine types of plans, including four concerning territorial planning (1—territorial general plan, 2—partial territorial plan, 3—sectoral plan, 4—coordinating territorial plan) and five concerning urban design (supra-local level: 1—coordinating urban plan, local level: 2—general plan compulsory for large cities, sub-local level: 3—urban improvement plan/urban improvement plan, 4—partial plan/partial plan, 5—special plan/special plan). An important mechanism of integrated planning is a stable division into three classes of land and two types of plans, coordinating both territorial and urban. The discussion also showed that the planning document and the strategic document correspond to completely different types of documents. And integrated planning is not about combining them.

5. Discussion

The theoretical background concerns the first and second stage of research, in which it was assumed that spatial planning is a special case of management and not an activity undertaken during management. Such an assumption is more justified as the new approach to strategic development planning requires integration with spatial planning and presenting the spatial management of a given territory in a more holistic manner. This new integrated planning constantly collects new spatial data and is a continuous, never-ending process that requires creativity and the involvement of qualified officials, as well as social participation [1–6]. In the thesis, the term ‘spatial management’ was used, which refers to local, subregional (functional areas), and regional spatial planning. It seems that an example of such understood ‘comprehensive planning’, with a high level of socialization of the planning process, is the planning system in Germany, recognized as comprehensively integrated with a clear set of spatial policy instruments, based, *inter alia*, on the operational land use plan. Strong planning tools, including zoning planning, were models for other countries around the world (USA and Great Britain) from the end

of the 19th century [14,15]. Similar types of plans operate in Austria and the Netherlands, where the information model of the planning system managed to include all spatial policy instruments, including as many as three types of zone-type plan [2,16,17]. It has become extremely important for the planning and spatial management process to provide complete, good-quality spatial data [2,4–6]. Spatial planning and spatial policy are ubiquitous and concern many entities. “Spatial/regional planning is the geographical expression of a society’s economic, social, cultural and environmental policies. At the same time, it is a scientific discipline, administrative technique and policy as an interdisciplinary and comprehensive approach to sustainable regional development and the physical organization of space in line with the overall strategy” (CEMAT). This definition fits perfectly with GIS technology and IIP distributed databases. Unfortunately, the potential offered by the established infrastructure is not fully used in Poland. Regional studies, including questionnaires addressed to all (16) local government units at the voivodeship level and the case studies of activities undertaken in a planning unit in the Lower Silesian Voivodeship (IRT Wrocław), show that there are large problems with collecting and combining spatial data on the planned use from the current type of plan prepared for the area of the entire municipality (suikzp). Moreover, according to the research, its role is insignificant, because it is binding on the municipality authorities when drawing up plans but not when issuing decisions. Suikzp is not an effective planning act; it does not effectively limit non-negative activities in space. Therefore, this plan is not a source of complete information about PLU. The implementation of the INSPIRE directive coincided with the time of reforms in Poland, but the two issues should be separated: (1) the spatial planning system in Poland needs to be repaired, and (2) INSPIRE requires full implementation (in such a way that users have access to complete datasets). The new package of regulations on development policy in Poland of 13 November 2020 does not solve the problems described here, because all improvements concern only better quality of higher-level strategic document preparation and not planning documents regulating the issues of changes in land use. Monitoring changes in ELU in relation to PLU from a given point in time is very difficult. It requires the collection of spatial datasets not only resulting from sub-local plans but also from many of localization decisions.

Both the results of the first stage and the second stage of the research (surveys and case studies), showing a high demand for complete datasets from the local level at the voivodeship level, also justified the thesis signaled by experts [Supplementary Materials] that SDIs created in Europe are related to a new approach to more integrated planning, which is a process of sorts. This ‘new integrated planning’ is in direct contrast to the traditional planning functioning in Poland, which focuses on many complicated regulations, preparation of fragmentary, discretionary, costly, time-consuming, sub-local zoning plans of various sizes (for 2–3 plots), and field inspections (construction supervision) of only the result of already completed investments. Spatial planning has been criticized by some researchers since 1990, and by others since 2003, but all researchers unanimously disagree with spatial chaos, lack of parking lots, and heavy traffic, which is a consequence of the lack of good planning instruments [25,26,29,34–36,38,40,41]. Integrated strategic spatial planning is a broader approach than traditional planning [2,16–21,25].

It considers the best use of the site and the provision of greater scope, support for policies, and other organizations to promote and manage change in each territory. New integrated planning is a consideration of what could happen and where [2,6,18]. It explores the interactions between different policies and practices across the region and places the role of place in a broader context. It is assumed that this new integrated planning will contribute to better spatial organization in Europe and to finding solutions to problems that go beyond the national framework. Its purpose is to create a sense of common identity in East–West and North–South relations. The most important thing should be to provide everyone with an environment and quality of life conducive to development, their personality in the context of planning for human scale, and real needs. Most European countries are characterized by a new strategic approach to spatial planning, considering

the European dimension [2,16–21,25,26]. The idea behind the new approach is that the side effects and outcomes of planning processes are monitored to integrate the outcomes of different ongoing planning processes. Planning, in its specificity, is more integrative and aims to coordinate and balance various interests [2,4–6,18]. For these reasons, it does not perform standardized routine operations, but is always a complex, unique, and creative process that is associated not only with technical tasks and specific methods but also largely with creativity. Planning systems in the EU countries are changing in this direction.

Spatial planning, in line with the position of the Council of Europe, should be democratic, comprehensive, functional, and long-term oriented. It should consider the existence of many individual and institutional decision-makers that affect the organization of space, the uncertainty of all forecasted research, market pressure, the specificity of administrative systems, and socio-economic and environmental conditions. Nevertheless, it must strive to reconcile these influences in the most harmonious way possible. The provided complete datasets on existing and planned spatial development can support new integrated planning becoming an integrator for all the above-mentioned stakeholders. The implementation of the INSPIRE guidelines came at a time of criticism and the needed reforms of spatial planning. SDI has become an opportunity for Poland, to provide comparable spatial datasets that are most needed for spatial planning at the regional level.

The method of using this potential depends upon paying more attention to the issues of ELU datasets described in the ‘land use specification’ [42,43]. Unfortunately, the issues of ELU are ignored in the research. Initially, the researchers focused more on the PLU databases and the most on the unification of sub-local zoning plans (mpzp) [27,28].

It can be concluded that these first actions could result from a different translation of the INSPIRE guidelines into Polish regulations, two examples of which the author cited. Interpreting the mandatory INSPIRE guidelines [42,43] on the need to share LU datasets on the European website and demonstrating in two stages of empirical research the negligible role of the current spatial policy instruments and much greater expectations of users as to the datasets made available on the geoportal, the author justified two theses of her research. There would be no need to share all decisions with location users if they were consistent with one zoning plan, developed for the entire area of the municipality. The guidelines for the reform in Poland go in this direction. The author took part in the preparation of guidelines for integrated planning at the local level, together with the Association of Polish Town Planners, Warsaw Branch, transferred to the competent Ministry. However, details are important; therefore, following the example of Dutch and German practices, the author also recommends inspirations for the form of this document in the article. In the author’s opinion, the Land Use Plan for the whole municipality should be binding only on administrative bodies when drawing up plans and issuing decisions. It is precisely justified by J. M. Chmielewski and A. Tölle [4–6]. The subject of LU is difficult and complex, but importantly, of interest to almost all countries in the world, not only in Europe. Building the LU (ELU and PLU) database is more difficult than land cover as it requires field use verification. However, there are many hints in the LU specification regarding the collected user needs and ongoing projects. Regarding the unification of LU nomenclature in Poland, all attention so far has been focused on PLU, especially sub-local zoning plans, and to no avail. The implementation of the extended scope of the guidelines is difficult because there are no Land Use Plans typical of other countries in Europe.

An example of good practice is the spatial policy tool in Spain and the division of land into three classes:

I—intended for urbanization, II—possible urbanization, and III—not for urbanization.

With regard to attempts to start monitoring LU with the use of comparable zones of the entire municipality, consistent with the Urban Atlas database standard, the activities undertaken in the planning unit at the regional level in the Lower Silesian Voivodeship are noteworthy. The Urban Atlas database is consistent with the European LU.

Writing about incomplete land use datasets resulting from guidelines and users’ needs, the author does not deny that at the stage of such and no other legal status, no better

solution could be adopted than the one that was chosen. However, a choice of datasets to be made available at the European level is still needed. The Head Office of Geodesy and Cartography was awarded the prestigious “Geospatial World Innovation Award 2021”. The award was granted in the “Spatial Data Infrastructure” category for facilitating access to official spatial data using the website www.geoportal.gov.pl (accessed on 20 July 2021) and for the release of a significant proportion of spatial data, favoring their popularization in society and increasing the level of use.

The author justified theses about the need to establish a new type of plan for the area of the entire municipality (actually managing the space and/or limiting further activities) and showing the relationship between the creation of SDI in Europe and a new approach to new integrated development planning. As a summary of all qualitative research, including interviews with various experts, the author presents the graphic location of the new Land Use Plan type in the proprietary model of “Spatial planning system in an integrated development policy”. The author hopes that all the information contained in this article will be an inspiration to complete the well-initiated reform of the spatial planning system (Figure A1). All the issues raised in this article require further discussion.

Supplementary Materials: The following are available online at <https://www.mdpi.com/article/10.3390/land10111138/s1>, Figure S1: Which planning acts should be shared in IIP? Resource: Own study, Figure S2: Decisions as a source information about LU? Resource: Own study, Table S1: Classification of documents determining spatial development in Poland.

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Appendix A

Spatial Planning in an integrated policy—own compilation.

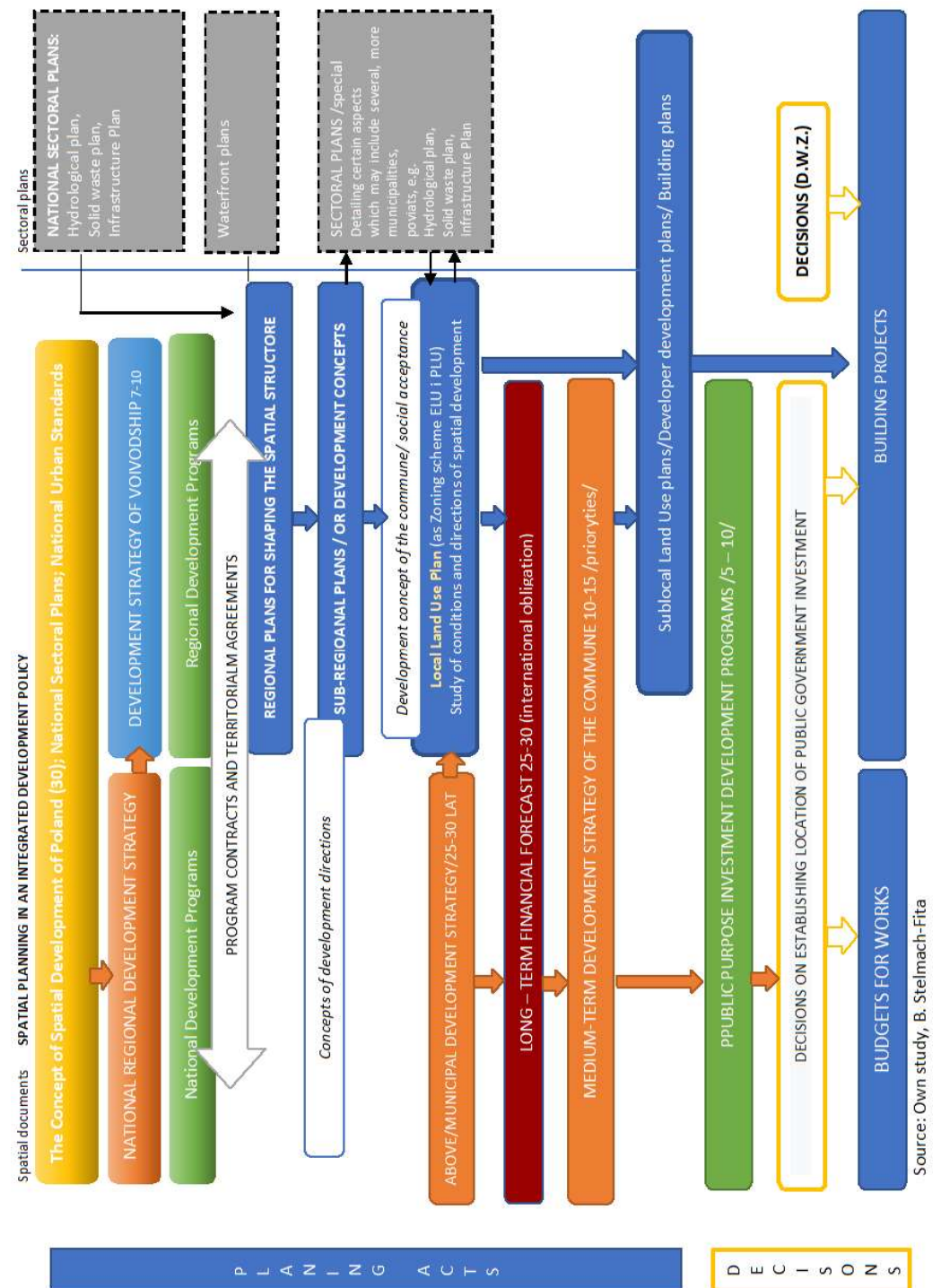


Figure A1. Spatial Planning in an integrated policy in Poland.

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