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THE MALFUNCTION OF PUBLIC AUTHORITIES IN THE SPATIAL PLANNING SYSTEM

The aim of the paper was to adapt the concept of the malfunction of public authorities to the spatial management system and to propose methods on the basis of which it can be verified. The paper contains a theoretical review, in which the context of the malfunction of public authorities in the spatial management system is presented, as well as an indication of the plane of malfunction verification from a formal and legal perspective. This concerns the judicial decisions of the Supreme Administrative Court relating to key planning tools, namely studies of the conditions and directions of spatial development and local spatial development plans. A definition of the malfunction of public authorities and its measurement were proposed, along with binomial models for analysing this phenomenon.*

Keywords: institutional economics, system malfunction, spatial planning, logit models

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1. INTRODUCTION

The key task of spatial policy tools is to protect spatial order and ensure optimal use (with maximum protection) of composition-aesthetic, environmental, cultural and socio-economic values of an area (Foryś and Nowak, 2016). Public authorities should take care of this aspect in particular, preventing from market malfunction in this context, however the literature on the subject also indicates their serious malfunction, making impossible the correct allocation and protection of resources in the spatial management system. This manifests itself in various spheres, among others, economic, legal and social. The literature distinguished the concept of inefficiency of public authorities in the spatial management system (Markowski, 2014; Nowak, 2017), however limited in-depth (research-based) attention has been paid to the role of jurisprudence in this context. The analyses so far have only dealt

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with the jurisprudence of the Provincial Administrative Court in relation to local spatial development plans, at the scale of one province (Nowak et al., 2020). This is a serious research gap. The inefficiency of public authorities in spatial management must be tested by concrete consequences. Apart from the (measurable) consequences related to spatial chaos (Śleszyński, 2018a), it is precisely the dimension concerning jurisprudence that seems to be important. At this stage, the quality of specific spatial planning instruments is also determined (with the proviso that the conclusions of the formal-legal assessment will not always be the same as the conclusions of the urban planning assessment, or those related to public policy sciences).

The paper refers to the concept of the malfunction of public authorities and is adapted to the spatial management system (proposing its specific economic definition). Therefore, the aim of the paper was to adapt the concept of the malfunction of public authorities in the spatial management system and to propose methods on the basis of which it can be assessed. Several hundred judicial reviews by the Supreme Administrative Court (NSA) from the last five years were analysed. All NSA rulings were classified on the basis of which annulment was finally found, i.e. three key tools of spatial policy were challenged: studies of conditions and directions of spatial development, local spatial development plans, as well as decisions on building and land development conditions in 2015-2019. A classification of rulings was made (separately for each tool) from the perspective of the categories of the reasons for questioning them, and the results were referred to earlier analyses related to the malfunction of the public authorities in the spatial management system.

2. MALFUNCTION OF THE STATE IN THE SYSTEM OF SPATIAL RESOURCE ALLOCATION

2.1. Malfunction in management theories

Discussing the efficiency or malfunction of public authorities' activities requires the adoption of a set of objective criteria to analyse and evaluate these activities. Efficiency/malfunction, as a criterion for assessing the process of spatial management, is as important as the usual criterion of efficiency, rationality, economy and efficiency described in the theory of praxeology (Pszczołowski, 1982). Thus, it is justified in the analysis and evaluation of the spatial resource allocation process understood as an element of a broader spatial management process, to refer to the efficiency or malfunction of this process. Knowledge of the weak links of the system can support the entire management process, and eliminate malfunction in order to improve its efficiency.

The notion of the malfunction of public authorities as the main stratagem in spatial management can be interpreted in many aspects, and by negating the ambiguous concept of efficiency. In technical sciences, the latter means the ratio of energy spent to that consumed, hence the system is not working when the energy spent is higher

than the energy consumed. By adapting this way of thinking, one can generalize that the spatial management system is malfunctioning when the energy spent on maintaining this system does not ensure the achievement of the assumed goals. System energy understood in this way is all the physical, human, organizational resources and financial outlays that are meant to ensure the achievement of the goal.

In the theory of organization management, efficiency is a criterion for assessing the functioning of an organization in a formal and legal sense, and in procedural terms for assessing organization management (Zieleniewski, 1981), Samuelson, on the other hand, is in favour of allocation efficiency. In this sense, the management process is effective when it is organized to supply consumers with the largest possible set of goods for the given resources and technology. The author also pointed out that economic efficiency should not be equated with efficiency in a technical sense. Sometimes it may be correct to use less effective methods instead of those that are undoubtedly more technically effective. In addition, according to the theory of rational expectations, rational management in a company is such activities carried out in good faith, according to common sense, the current knowledge of the persons implementing them, regardless of what form of ownership the owner is associated with (Samuelson and Nordhaus, 1995).

Efficiency is an inseparable element of the economy, which is defined as better results compared to the average state, in terms of achieving the objectives of the business entity's activity in given technical, organizational, economic and staffing conditions. The assumption for the comparability of goals is their quantification through appropriate measures of economic activity, hierarchical ordering and implementation of rational operation principles. In institutional terms, an efficient organization is considered to be one that implements its strategy in a timely manner, i.e. achieves its objectives optimally using the resources that it possesses.

As noted by Masiukiewicz (2007) in his praxeological considerations, efficiency refers to an activity that has at least one of the values of good work (Kotarbiński, 1973), and next to the activity and economic efficiency of activities, ethics should also be added, which allows for assessing the fairness of the purpose. However, according to Masiukiewicz (2007) and Zieleniewski (1981), the definition can be formulated as "efficient operation in the general sense is one that meets the requirement of minimal effectiveness" (...); if the choice of a variant was determined by the value of the effect, it is the most beneficial or economical among the effective ones, but if the choice of the variant was determined by profitability or economy, the most efficient is the variant (...) which is the most effective among the most beneficial or most economical one". Hence, no action is efficient in a general sense unless it provides minimal effectiveness understood as achieving a goal. In this approach, efficient action is an effective action that leads to the achievement of the assumed goal, and in spatial management, malfunction is an ineffective action, i.e. one that does not ensure the preservation of spatial order.

According to Masiukiewicz (2007, p. 5), management efficiency is a feature of the management process that is intended to provide economic and social benefits or minimize losses to the business entity and its environment. Therefore, efficiency of operation should be seen in three perspectives: objective, subjective and attribute-based, which allow defining criteria for assessing the efficiency. The objective approach includes: regulation making, human work, management, competition and innovation. In subjective terms, efficiency should be considered in the context of the entities involved in the process: employees, management staff as well as institutions and bodies, and in the aspect of their activity look for criteria for assessing the efficiency of operations. The subjective approach enables the analysis of human activities and other entities. In the last, attribute approach to efficiency, one should consider: time, rationality, quality, correctness, compliance with principles, norms and regulations. In each approach there are elements that can be assessed through a set of measures, but there are also those that cannot be quantified.

Referring to one of the quoted definitions, namely that malfunction is an action, which does not meet the requirement of effectiveness or implementation of the assumed goal with given resources, one can define the malfunction of spatial planning in the entire spatial management system. Since the goal of the spatial management system is to preserve the spatial order, and planning tools contribute to the achievement of this goal, the malfunction of this system means the ineffectiveness of achieving the assumed goal or malfunction at any stage of the process. Hence, the assessment of the malfunction of the spatial management system may include in particular issues regarding:

- institutional policies and strategies in the field of spatial management,
- regulation and licensing by state institutions of trade in specially protected areas,
- effective space management,
- level of environmental quality maintenance,
- effectiveness of state supervision and control as well as enforcement of rights supporting the spatial management process,
- social costs of wrong decisions and faulty legal regulations.

In the discussed system, state institutions (the state) are an integral part, and spatial planning tools are in their competence. Therefore, the unreliability of the system also proves the malfunctions of institutions, which include the planning, organizational and control competences of the spatial planning system.

2.2. Objectives and principles of the functioning of the spatial management system

Contemporary concepts of space management are based on adapting geographical space to human needs and values in accordance with the principles of sustainable development (Foryś and Putek, 2015), and rational spatial policy is implemented on the basis of location coherence (Gorzym-Wilkowski, 2006). This means striving for

the optimal location of each activity in space in such a place that it provides the best set of features for the intended function (Foryś and Kazak, 2019).

In the literature, at the level of spatial analysis and in order to respect the territorial scope and coherence of spatial management objectives, especially in the process of implementing various investments, five management strategies are indicated (Cliquet and Baray, 2020): contiguous expansion strategy, beachhead strategy, clustering strategy, skim strategy, and acquisition or merger strategy. Each of these strategies is meant to lead to the rational use of space as a limited resource, but not to unduly limit the freedom of investors and property owners. This approach ensures the highest utility value related to the suitability of the space for a specific function, which results from natural values (land, soil, water and climate conditions, mineral resources), ecological environment and space transformations resulting from human activity (buildings, infrastructure) and cultural heritage.

The rational use of space due to social goals is not always consistent with the individual expectations of the users of space, in particular property owners, whose individual preferences deviate from the general expectations. Regional planning has traditionally been seen as a form of direct state intervention in market processes (Friedmann and Forest, 2017, p. 16). The divergence of individual and general interests raises spatial conflicts which may touch on the concept of using space, improper neighbourhood of functions or the loss of functional values as a result of state intervention, especially when, as a result of planning procedures, real estate loses its value or its current use is restricted, the conflicts and disputes arise. These are the so-called social costs of planning intervention of the state or authorized institutions, and in economic theory, external effects on the real estate market (Batóg et al., 2019).

The introduction of new functions in an area is caused not only by purely physical changes in space, but also by significant social changes, e.g. resulting in far-reaching changes not only in space but above all in interpersonal relations such as the process of gentrification (Foryś, 2013), and the socio-economic consequences of suburbanization (Jordon et al., 1998; Zhao, 2013).

From a market point of view, space valuation is an important element in the space management system. It has a purely economic dimension related to the value of land, as a result of its utility, scarcity and marketability. Since the right to dispose of a part of the land is the subject of market turnover, the value of space can be equated with its market price (e.g. development land), and also with a price that is not always financial (e.g. ecological value), but it is linked with the place in the hierarchy of social values.

In a market economy, planning decisions determine the use of undeveloped land, and thus affect their market value. Both location theory and the scientific research presented in the literature (Friedmann, 2004) indicate a strong relation between planning decisions and land use with their value and demand for a given location (Ratner and Goetz, 2013). Hence, in a market economy, the purpose of

state intervention in the spatial management system cannot be to regulate market processes in the area of freedom in real estate management, but rather actions aimed at preserving the spatial order, protecting natural resources and implementing socially justified investments in accordance with the principle of sustainable development (Harrison, 2018).

2.3. Formal and legal procedure for reporting the system errors in the planning procedure

From the formal and legal perspective, spatial policy acts constituting resolutions of the commune council can be appealed against to administrative courts: first of all, to the voivodeship administrative courts, and from these decisions a cassation complaint can be filed with the Supreme Administrative Court (NSA). The applicant may be an entity with a legal interest. This means that the appealed planning act must directly violate someone's subjective right (usually property ownership or perpetual usufruct right). Legal interest is much easier to demonstrate when appealing against local spatial development plans (commonly binding acts) than in the case of spatial development conditions and directions of studies.

The court is bound by the allegations contained in the application. In addition to the dismissal of the complaint (for formal reasons, e.g. due to the applicant's lack of legal interest), the following consequences for planning acts can be distinguished:

- cancelling the planning act in whole or in part;
- upholding the contested act (Nowak, 2020).

Therefore, the assessment is of a strictly formal and legal nature and does not cover the key context related to spatial order and spatial chaos. The specificity of court-administrative proceedings is also the fact that no expert evidence is used in this case. The allegations may therefore concern the content of specific planning acts or the procedure related to their preparation. Verification of the content of planning acts may be divided – for the purposes related to this approach – into an analysis of the scope of individual acts (in terms of their compliance with other acts, general correctness, consistency, etc.), and an analysis of the interference degree of the planning act in the sphere of individual subjective rights (in particular, property rights). The latter consists in assessing whether the restrictions introduced in the planning act do not constitute a violation of planning power, and at the same time, the principle of proportionality of interference in the sphere of property rights. Theoretically, the justification for such interference should be issues related to the protection and shaping of spatial order. In practice, however, as part of the interpretation of the regulations (which is a separate problem related to the malfunction of public authorities), authorities and courts too rarely refer to these issues explicitly and specifically. The perspective of the specific property owner is definitely more widely adopted (Zachariasz, 2012; Nowak and Tokarzewska-Żarna, 2016), therefore some of the restrictions needed from the perspective of spatial order

are not justified in the formal and legal sphere (which does not mean, however, that any judgment leading to a challenge from this perspective of a planning act should be classified as harmful to spatial order).

2.4. Malfunction of public authorities in the spatial management system

Issues related to the spatial management system are taken from the perspective of different countries in various ways. The subject of discussion is both the possible range of interference by public authorities in the sphere of private property rights, the broader territorialisation of development policy, and the protection of spatial order in the context including cohesion policy (Böhme and Waterhout, 2008; Faludi, 2010), as well as a broader analysis of selected issues, such as environmental protection, suburbanization, the new role of cities and urban policy (Fulton et al., 2001; Tellier, 2019; Smith, 2006; Soja, 2001). The role of the law in the spatial planning system deserves separate attention, also in the context of the issues addressed in this paper. This includes both the general objectives of the law in spatial planning, as well as their translation into spatial policy instruments. As regards the former, the prevailing approach is that the legal regulations in spatial planning should not be too detailed in order not to block development (Moroni et al., 2020). Some indicate that it should be limited to the resolution of spatial conflicts (Alfasi and Portugali, 2007). These obligations that the law provides for must certainly be fulfilled (Savini, 2016). There is a debate in the literature about where to draw the line between flexibility in planning and the certainty of the implementation of certain rules (Tarakçı and Türk, 2020; Muñoz-Gielen and Tasan-Kok, 2010). The answer to this question requires adapting to the realities and planning culture of each country. Similarly, the role of spatial policy instruments, even local spatial plans themselves, varies. Depending on the country, they can be generally applicable acts as well as just a set of guidelines. In the literature, the role of judicial decisions themselves is analysed to a limited extent in this context (Nadin, 2012). It is estimated that the quality of spatial policy is much more widely dominated by planning culture, inter alia linked to social conditions (Purkarthofer et al., 2021). Nevertheless, the way in which spatial policy instruments are approached formally, and how the courts interpret the rules are also part of the planning culture.

From each country's perspective, these generally outlined directions and issues are becoming more specific, more broadly adapted to specific conditions, which does not change the need to perceive spatial planning from a wider perspective (Faludi, 2018). This also applies to the case of Poland, where the key issues in the spatial management system currently concern:

- protection of spatial order, also limiting the effects of spatial chaos (Kowalewski et al., 2014);
- integration of development policies and including spatial policy in this respect (Markowski, 2014);

- holistic consideration of disciplinary diversified perspectives: geographical, architectural, economic, legal, environmental and cultural (Nowak, 2019).

From the perspective of the malfunction of public authorities, the first of these issues seems particularly important. Spatial chaos is associated not only with negative compositional and aesthetic effects, but also includes others – some of the key ones distinguished in the literature are:

- settlement, i.e. the phenomenon of *urban sprawl*, especially in suburban areas, spatial and functional conflicts (Gibas and Majorek, 2020; Feltynowski, 2009; Śleszyński, 2016; Śleszyński, 2018a);
- connected with the real estate market, which may be reflected above all in the formation of a speculative bubble in the real estate market, but also higher expenditure incurred by municipalities (Maćkiewicz and Kalarus-Wiatr, 2017; Lityński, 2019; Śleszyński, 2018b);
- environmental: related to the degradation of the environmental, landscape or aesthetic values of areas, which also translates into determinable costs (Chmielewski et al., 2018; Giedych, 2018; Nowak and Kiepas-Kokot, 2014);
- transport: constituting the consequences of location of buildings incorrect from the functional perspective. This is reflected in the longer commuting times, more frequent accidents and negative environmental effects (Lityński and Hołuj, 2018).

Only the key consequences of spatial chaos were signalled above. Due to the fact that they are noted in the literature to a very wide extent, it can be stated that spatial policy tools (especially those at local level) do not fulfil their main role well, i.e. the protection and shaping of spatial order (Izdebski et al., 2018; Nowak, 2017).

At this point, the focus was put on the key spatial policy tools at local level in the context under review, namely studies of conditions and directions of spatial development and local spatial development plans. No decision was made on the development and land development conditions which aroused reasonable doubt as to the general possibility of qualifying as a tool for spatial policy (it is rather the institution that simply deepens spatial chaos). The study is a strategic act, assuming general local spatial development principles in the commune, and optional local plans are regulatory acts implementing previous assumptions.

The statement regarding the majority of the country's area of dominant spatial chaos leads to the conclusion that the basic objectives assigned to these tools are not implemented and, as a consequence, there is a malfunction of public authorities in this sector. To better define this, it is necessary to isolate the key systemic problems of these tools. When it comes to studying conditions and directions of spatial development, the problems are in particular:

- limited scope of application; often even the provisions of the study remain insignificantly used at further planning stages;
- unclear formal scope of the study and unclear scope of its detail – which definitely opens up the discussion about challenging it before the courts;

- limited use of the balance of built-up areas prepared on the occasion of works on the study (its change), which results in the lack of guarantee for shaping settlements in accordance with spatial order.

In relation to local plans, the key issues can be identified as follows:

- lack of sufficient legal basis for a broader protection of spatial order (moreover, connected with the perception of the concept of spatial order and its role in the spatial management system, which is different in part of the legal doctrine, rather than from an urban perspective);
- optionality of plans, which significantly limits their overall role in the spatial management system, and already when adopting plans allows to deliberately bypass problematic areas from the perspective of spatial order and spatial conflicts;
- problems in fully identifying environmental and cultural needs (and provisions) in local plans; this often results in incomplete (from the perspective of real needs) provisions of plans in these parts.

The above must be included in the context of court and administrative proceedings regarding the indicated spatial policy tools. Judgments of the Supreme Administrative Court, substantively assessing the planning acts, allow primarily from the jurisprudence, formal and organizational perspective to verify the malfunction of public authorities. On the basis of the compiled judgments, their scope, as well as the mode and legitimacy of complaints, significant measures characterizing the malfunction of authorities in the field of spatial planning may be proposed. The rejection or dismissal of a planning act indicates errors made in the entire spatial planning process, therefore it is a measure of the malfunction of state institutions in the discussed system.

The literature on the Polish spatial management system increasingly draws attention to the weakness of the legal framework, which also does not leave much room for manoeuvre for the courts (Nowak and Lorens, 2020; Markowski and Nowak, 2021; Gdesz, 2020). Therefore, the courts cannot be treated as entities willing to fully correct spatial policies. The indicated malfunction of an institution can be measured by the level of planning acts, which after passing the law of an authorized appeal procedure, go to the last instance, which is the Supreme Administrative Court. In this context, the measure of malfunction may be the percentage of legal acts challenged by the Supreme Administrative Court from among the spatial planning system appealed by stakeholders, weighted by the scope of complaints submitted or as a simple percentage of repealed legal acts in relation to the total number of complaints submitted. In both approaches, the higher the value of the determined indicator, the higher the level of state malfunction in the spatial planning system. This assessment must be expressed on one more assumption, i.e. that the approach of NSA to specific planning acts will be a measure of the malfunction of public authorities in the spatial management system, but at the same time this malfunction is noticeable when the court itself acts. The courts act within the limits of the law, and these are shaped by malfunctioning public authorities.

3. MALFUNCTION OF PUBLIC AUTHORITIES IN PLANNING PROCESSES IN QUANTITATIVE TERMS

3.1. Variables identified based on NSA rulings

An introduction to the quantitative study was the analysis of the full set of NSA rulings (based on the NSA case law database) from 2015-2019. The research period is in years, from which one can count changes in law and case law, potentially affecting the content of individual decisions in the last decade. As a result, 557 documents were selected, substantively concerning two planning instruments: a study of the conditions and directions of spatial development (denoted by *studium*) and local spatial development plans (denoted by *mpzp*).

Each of the rulings was treated as a research object and in this context, 48 study objects and 509 local spatial planning were available. The structure of the examined objects in subsequent years of analysis is shown in Figure 1.

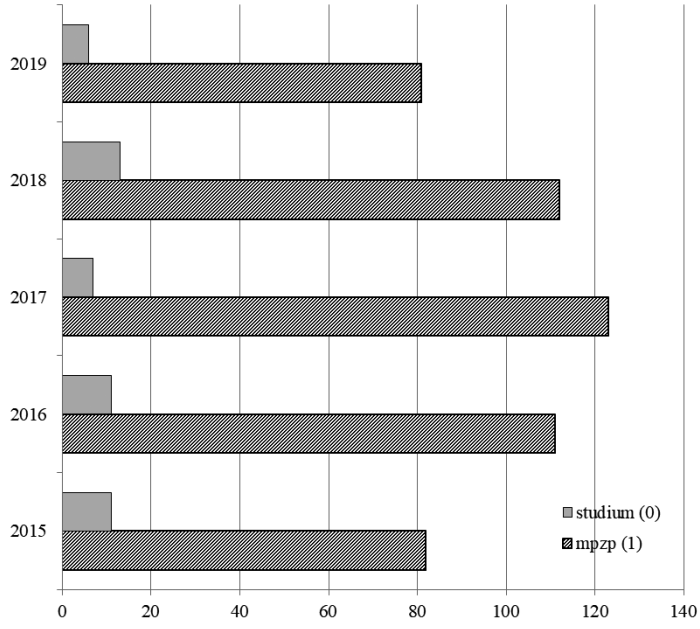

Fig. 1. Structure of the analysed planning objects in 2015-2019

Source: own study.

It should be noted that the Supreme Administrative Court questioned primarily the arrangements contained in local plans (91.4%). The accumulation of complaints related to the provisions of the *mpzp* taking place in 2017. The division of the studied sample into shorter units of time than years is not justified, as court complaints are

in long queues and the differences between the quarters could be more associated with the internal organization of the Supreme Administrative Court, rather than with general tendencies in the field of assessment of studies and *mpzp*. Therefore, it makes no sense to determine the trend of the number of decisions issued by the Supreme Administrative Court separately for each planning act.

With the exception of the last year of the analysis, the number of appealed acts has an increasing tendency, which means a dynamic increase in the number of decisions issued by the Supreme Administrative Court. This condition is primarily influenced by the appealed provisions of local plans. It follows from the above that the number of serious spatial conflicts that translated into the consideration of a given case at the highest possible level (NSA), increased over the period considered.

For further analysis, certain designations related to the information resource were adopted, which were obtained in each analysed case. These variables are as follows:

- *Designation* – designation of the document to which the complaint relates, which is 1 in the case of the *mpzp* and 0 for the study;
- *Complainant* – complaining entity, i.e. the owner of the property, voivode, Prosecutor General, association and the Agricultural Property Agency. Due to the incidence of the indicated complainants and the methods used hereinafter, a division into two groups of entities was adopted: the owner/perpetual usufructuary of the property, to which the planning act relates (the variable assumes the value 0) and other entities representing institutions, state bodies or other organized entity (variable takes the value 1). The value of 0 was obtained in 107 cases, in the remaining 450 cases the applicant was the owner;
- *Effect* – status of a legal act, meaning annulment (in whole or in part) of a planning act (the variable takes the value 0) or maintenance in force by the Supreme Administrative Court (the variable takes the value 1). Due to the analysed system malfunction, it is desirable to keep the act in force, which means that the system followed expectations from the organizational and legal side and the planning procedure was carried out correctly. In the analysed sample, 228 acts out of 596 (40.9%) were annulled (in whole or in part). Such a size is directly reflected in the issue of the analysed disability;
- *Allegation* – types of allegations addressed to the Supreme Administrative Court, covering categories: P – procedural allegations (regarding the procedure itself, e.g. work on the plan), Z – scope of a given act (allegations relate to the fact that the scope of the act is not in accordance with the Act, Regulation, etc.), O – the allegation concerns the restriction of ownership by a planning act, e.g. development restrictions, OCH – a very rare allegation, according to which the planning act does not sufficiently protect the values related to spatial order. In the sample examined, 121 cases concerned procedural allegations, 159 scope of the act, only three cases of protection of values related to spatial order, while as many as 274 cases concerned the restriction of ownership by a planning act (49.2%).

Two limitations were adopted in the analysis of NSA verdicts. Time limitation, as a result of which the years 2015-2019 were taken into account (variable *Year*). In this way, the study addressed the most current problems related to the manifestation of state malfunction and the spatial planning system. The second limitation concerns the assessment of two planning tools, i.e. a study and local plans, because in both cases the problems resulting in a complaint are similar. Development decisions, widely criticised in the literature, were excluded from the analysis (Nowak and Kreja, 2012).

3.2. The case law of the Supreme Administrative Court as a measure of the malfunction of public authorities

Preliminary analysis of the obtained data showed the scale of the problem and entities that have noted the problem and took formal steps to challenge the planning act.

A simple analysis was performed according to several significant variables for the purpose of the study. In the case of an allegation regarding the limitation of ownership (O) by a planning act, e.g. limitation of building development, complaints were lodged primarily by property owners (97.1% of all complaints), with only 29.9% of all complaints filed resulting in the annulment of planning acts (Table 1).

Table 1

The structure of allegations and effects for the planning act in 2015-2019

Allegation	**Sum**	***Complainant* (1)**	***Complainant* (0)**	***Effect* (0)**	***Effect* (1)**
O	274	8	266	82	192
OCH	3	1	2	2	1
P	121	44	77	55	66
Z	159	54	105	90	69
Sum	557	107	450	229	328

Source: own study.

In the OCH category, three complaints ended with annulment of the act. In the case of procedural (P) allegations, there were almost twice as many owners as applicants than other entities, while 83.3% of planning acts were annulled. Such a high percentage of repeals in this group of cases indicates the malfunction of the planning process on the side of the legal regulations and the institutions obliged to implement them. Similarly, one can interpret the objection regarding the scope of a given act (Z) as a weakness of the system, including in particular the non-compliance of the act with the act, regulation, etc. In the analysed set, twice as many property owners as other entities raised this allegation, and as a result, in over half of the cases the act was annulled. While allegations of infringement of property rights should be

assessed in a slightly different context (especially in these cases, the court's position will not always be correct from the perspective of the key objectives of the spatial management system, including the protection of spatial order), procedural errors and errors related to the scope of planning acts, they are without doubt a measure of the efficiency of the public authorities. This applies both to the context of the central authorities, creating regulations that cause problems, as well as the local authorities, making formal and legal errors. This has a negative effect in the form of undermining the planning act, and thus, at least in part, the local planning order. This is even more acute when the purpose of adopting a specific act was associated by the local authorities with broader protection of spatial order and withholding uncontrolled development.

The improvement in system efficiency was assessed by examining the change in the percentage of repealed planning acts over time (Table 2).

Table 2

Dynamics of repealed planning acts against the background of complainants

Year	***Complainant* (1)**	***Complainant* (0)**	***Effect* (% repealed)**
2015	13	80	47.3
2016	19	103	36.1
2017	31	99	33.1
2018	27	98	47.2
2019	17	70	43.7

Source: own study.

When assessing the effectiveness of the spatial planning system after 2015, it can be seen that the trend of the percentage of repealed legal acts in this area remains stable at 33%-47.2% of all cases examined by the Supreme Administrative Court. This means that more than one-third or even half of the complaints were justified, which proves the weakness of spatial planning in Poland, including the planning system together with the state institutions established for this process. This weakness is especially adverse compared to solutions in Western countries, where the malfunction of public authorities in the spatial management system occurs to a much lesser extent and the discussion may focus directly on typically spatial problems, included in the context of an integrated development policy.

Based on the above relations, the previously proposed indicator can also be determined, which is a measure of the state's malfunction in the spatial management system. The measure of malfunction is the quotient of the sum of the number of *mpzp* and *stadium* acts repealed, weighted by the share of the act (*w1 – mpzp*, *w2 – studium*) in the total number of appealed acts to the total number of appealed acts (Table 3).

Table 3

Indicators of state malfunction in the spatial planning system and the rate of acts repealed in 2012-2019

Years	Number of contested planning acts (N)			Number of planning acts repealed			Weight *w* (share of a given act in the total number of contested)		Product of weight *w* and number of acts repealed		Measure of malfunction	Index of repealed acts
	mpzp	*studium*	*sum*	*mpzp*	*studium*	*sum*	*w1 (mpzp)*	*w2 (stadium)*	*mpzp*	*studium*		
2015	82	11	93	40	4	44	0.88	0.12	35.3	0.47	0.38	0.47
2016	111	11	122	39	5	44	0.91	0.09	35.5	0.45	0.29	0.36
2017	123	7	130	41	2	43	0.95	0.05	38.8	0.11	0.30	0.33
2018	112	13	125	51	8	59	0.90	0.10	45.7	0.83	0.37	0.47
2019	81	6	87	36	2	38	0.93	0.07	33.5	0.14	0.39	0.44

Source: own study.

The value of the designated indicator is in the range of ⟨0.1⟩, the higher the value, the more acts are repealed, while the greater the weight of a given legal act, i.e. the greater the share of local plans or study as contested acts will weigh on the value of the measure. On average, the indicator reached 0.35 in the period under review, i.e. it was in the lower range limits. Weighting the repealed acts was proposed due to the planning process itself and its spatial effects. The study is a document that sets out the directions of spatial development in a fairly general outline, while the local spatial development plan is already a regulatory act of local law that precisely defines the possible use of space. For this reason, the imperfections and both formal and legal defects of this document are so severe to the applicants. On the other hand, apart from the importance of individual legal acts, one can analyse the problem of system imperfections by a simple indicator (percentage) of acts repealed in the total of appealed acts. On average, 41% of the contested acts were annulled over the period considered. Here, too, values greater than zero will determine the malfunction of state institutions in the spatial planning process.

3.3. Classic models in the assessment of the planning malfunction of public authorities

Preliminary analysis of the obtained data showed the scale of the problem and the entities that are involved in the procedure of appealing against planning acts. However, econometric tools allow searching for relations between individual multidimensional objects, including the effects on the contested acts depending on the variables described in this document.

Therefore, in the subsequent step, the interdependence of the defined and categorised variables describing NSA decisions was analysed. For this purpose, Spearman rank-order correlation coefficients were determined, which measure the strength of nonlinear dependence, and are used to describe the relations on weak scales (Table 4).

Table 4

Spearman rank-order correlation table

Variable	*Designation*	*Complainant*	Year	*Allegation*	*Effect*
Designation	1.000000	0.033514	–.012654	0.114429	0.017589
Year	0.033514	1.000000	0.062087	–0.026203	–0.021343
Complainant	–0.012654	0.062087	1.000000	0.034021	–0.335516
Allegation	0.114429	–0.026203	0.034021	1.000000	–0.112074
Effect	0.017589	–0.021343	–0.335516	–0.112074	1.000000

Note: Designated correlation coefficients are significant at $p < 0.05000$

Source: own calculations.

There is a statistically significant negative relationship between *Effect* and *Year* as well as between *Effect* and *Allegation*, which are not strong relations. A negative relation means that an increase in one value affects the decrease in the other. Spearman's rank correlation coefficients do not provide an unambiguous answer as to the existence of a causal relationship, rather they indicate the strength and direction of dependence.

In the subsequent step, a statistically significant relation was sought between the decision of the Supreme Administrative Court regarding the submitted complaints, and the variables that would in particular indicate the relation of the decision to repeal the act or maintain its validity. To this end, the multiple regression model was estimated at the outset (Table 5).

Table 5

The results of the multiple regression model estimation for the *Effect* variable

N = 598	b	Standard error	t(595)	P
Constant term	7.574373	2.776351	2.72818	0.006571
Complainant	–0.415999	0.049691	–8.37170	0.000000
Allegation	–0.067632	0.027199	–2.48653	0.013193

Note: $R = 0.349808$, $R^2 = 0.122366$, $F(2.554) = 38.621$, $p < 0.000001$

Source: own calculations.

In the model in which the dependent variable was *Effect*, at the adopted level of probability, the parameters at both variables *Complainant* and *Allegation*, with a negative sign, turned out to be statistically significant. The maintenance of the act is therefore related to a different applicant than the owner of the property, but the interpretation is limited by the very poor quality of the model ($R^2 = 0.12$). For this reason, in the subsequent step the binomial model for the qualitative variables was used. Binomial probit model for assessing the malfunction of public authorities in spatial planning was used.

Logit models are commonly used to describe qualitative phenomena, including binomial models, in which 0 or 1 value is assigned to dichotomous variables (Cieślak, 2001; Gruszczyński, 2001). The explained variable is probability p that the dichotomous variable under consideration will assume the value 1, which means that a desired event occurs, or 0 otherwise.

For the case and the probability of taking the value 1 (the desired phenomenon occurs) or 0 (when the phenomenon does not occur) it is:

$$P(y_i = 1) = p_i \quad \text{and} \quad P(y_i = 0) = 1 - p_i \,. \tag{1}$$

Probability p_i is a function of the vector of explanatory variables X and parameter vector β (Cramer, 2004):

$$p_i = P(y_i = 1) = \int_{-\infty}^{x_i^T \beta} \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{t^2}{2}\right) dt \,. \tag{2}$$

The logit for the above function is calculated as an inverse function, hence it is determined from the following formula:

$$ln \frac{\mathrm{p_i}}{1 - \mathrm{p_i}} = \beta_i + \sum_{i=1}^{k} \beta_i x_i \,. \tag{3}$$

Due to the limitation of the probability p to the ⟨–1.1⟩ range, the modelling is not directly related to the probability of p, but the logarithm of the ratio of the odds of accepting or not accepting the value of 1 by variable Y. When the odds are equal ($p_i = 0.5$), then function (3) assumes zero value. When $p_i > 0.5$, the function takes negative values, and for $p_i < 0.5$, positive values.

The parameters of the probit regression model are selected by the method of maximum reliability or generalized method of least squares. For the values of the observed variables, the model parameters should be estimated so as to ensure the maximum logarithm of the probability function. However, the total effects test is used to assess the significance of the estimated model parameters. If the null hypothesis assumes the lack of significance of each model parameter separately (Gruszczyński, 2001), then the Wald statistic used in this test has a chi-square distribution.

To test the null hypothesis that all model parameters, except for the constant term, are equal to 0, a probability ratio test is used, which is valid for estimating models with the highest probability method. The test statistics have a chi-square distribution with a number of degrees of freedom equal to the number of explanatory variables of the free expression model (Gruszczyński, 2001):

$$\chi^2 = 2\left(\ln L - \ln L_0\right), \tag{4}$$

where: L – maximum reliability function for the considered model,
L_0 – maximum reliability function for the model containing only the constant term ($\beta_i = 0, i = 1,\ldots,k$).

The quality of the binomial model can be assessed using the D deviation, which compares the analysed model with the full model, i.e. one in which the number of parameters is equal to the number of observations (Cramer, 2003):

$$D = 2\left(\ln L_p - \ln L\right), \tag{5}$$

where: L – maximum reliability function for the considered model,
L_p – maximum reliability function for the full model.

Deviation D has an asymptotic chi-square distribution. The analysed model is characterised by a good fit if the obtained quotient of deviation value D and the number of degrees of freedom is close to 1. The measure of compliance of the model with empirical data is McFadden's pseudo R^2 (equivalent to the classic coefficient of determination for the linear model estimated by the least squares method). This measure compares the logarithm of the maximum of the probability function of the analysed model with the logarithm of the maximum of the probability function of the model, in which only a constant term occurs (Gruszczyński, 2001):

$$R^2_{McFadden} = 1 - \frac{ln\, L}{\ln L_0}. \tag{6}$$

The value of $R^2_{McFadden}$ is in the range (0.1). Values close to 1 mean a very good fit of the model, close to 0 means no fit. Other measures with similar interpretations are also proposed in the literature, e.g. by Nagelkerk or Cox-Snell.

To assess the quality of the model, one can also use the accuracy of forecasts obtained on its basis, i.e. measures of forecast accuracy. The accuracy of *ex post* forecasts is most often presented using a case classification validity table, counting the numbers n_{ij}, respectively (Table 6).

The accuracy table makes it possible to determine two model fit measures: R^2. (count) and odds ratio (*IS*). The former measure expresses the share of correctly predicted cases in the total number of cases, the latter is the ratio of the product of correctly classified cases to the product of incorrectly classified cases.

Table 6

Case classification table

Observed cases	Forecast cases		Sum
	$\hat{y}_i = 1$	$\hat{y}_i = 0$	
$y_i = 1$	n_{11}	n_{10}	n_1
$y_i = 0$	n_{01}	n_{00}	n_0
Sum	n_1	n_0	n

Source: Gruszczyński, 2001.

$$R^2\left(\text{count}\right) = \frac{n_{00} + n_{11}}{N} \cdot 100, \qquad IS = \frac{n_{11} n_{00}}{n_{01} n_{10}}, \tag{7}$$

where: n_{11} – number of cases for which both the actual and predicted values are also 1;
n_{10} – number of cases for which the actual value is 1 and the predicted value is 0;
n_{01} – number of cases for which the actual value is 0 and the predicted value is 1;
n_{00} – number of cases for which both the actual and predicted values are equal to 0.

Counting range R^2 is (0,1). The higher its value, the better the fit of the model. The odds ratio, as one of the measures of the model's fit, should be greater than 1. Values greater than 1 mean more accurate than accidental case classification.

3.4. Results of the binomial model estimation

The calculated statistics of odds ratio *IS* = 5.82 means a more accurate classification than the accidental case, while counting range R^2 means that 68.58% of cases were correctly classified. It should be noted that with a probability equal to 1, i.e. $y_i = 1$, the accuracy of forecasting that the contested act was maintained (which means the desired situation that there was no error in the system) was 91.49%, while the accuracy of forecasting the value $y_i = 0$ (the act will be repealed) amounts to 35.53% of the total number of cases, which would be the proof of errors in the spatial planning system (Table 7).

In the subsequent step, the dependent variable *Effect* and two independent variables: *Complainant* and *Allegation*, were analysed. The results of the binomial model estimation are presented in Table 8.

Of the accepted explanatory variables, only the parameter at the variable *Complainant* is statistically significant at the adopted level of confidence. The sign of the estimated parameter value defines the direction of the relation between the independent and dependent variable. It has a negative value, which means that if the complainant is a province's governor, foreman or prosecutor, the value of the ratio $p/(1 - p)$ is higher, which means that the probability that the planning act will be maintained in the contested form increases.

Table 7

Case classification table

Observed cases	Forecast cases		Sum	Percentage of correctly classified
	$\hat{y}_i = 1$	$\hat{y}_i = 0$		
$y_i = 1$	301	28	329	91.49
$y_i = 0$	147	81	228	35.53
Sum	448	109	557	
Odds ratio (*IS*)	5.9235			
Log of odds ratio (ln*IS*)	1.7789			
R^2 count	68.58			

Source: own calculations.

Table 8

Estimation of binomial models

Effect	Level	Estimation	Standard error	Wald statistics	p
Constant term		0.243925	0.204824	1.41825	0.233692
Complainant	0	–0.494252	0.079049	39.09295	0.000000
Allegation	P	–0.226838	0.218225	1.08049	0.298587
Allegation	O	–0.319297	0.210408	2.30286	0.129136
Allegation	Z	0.115538	0.213457	0.29297	0.588321

Source: own calculations.

In Table 8, the parameters regarding the allegations (P, O, Z) are differences in relation to the level of the OCH variable (insufficient protection of monuments, environment, forests, etc.). Thus, the explained ratio $p/(1–p)$ is exp(–0.226838) higher for procedural allegations than for insufficient protection. Accordingly, it is more likely that allegations of a technical nature (Z) will not be resolved by maintaining the planning act in its current form. Unfortunately, due to statistically insignificant parameters of these variables (at the confidence level of 0.05), they cannot be interpreted (Table 8).

The binomial model for the probit binding function is estimated below, in which the probability that the effect of the act will be 0 is modelled, which means that it will be repealed (Table 9).

Both variables turned out to be significant in the estimated model at the level of assumed probability, except for the constant term. For a statistical assessment of the estimated model, McFadden's R^2 (0.084), Cox-Snell R^2 (0.114) and Nagelkerk's R^2 (0.154) statistics were determined. The statistics are not the highest, which does not translate into the best quality of the estimated model, but allows to notice

Table 9

Estimation of binomial models

Effect	Effect for act – Test of all effects Distribution: BINOMIAL, binding function: PROBIT Modelled probability: *Effect* = 0		
	Degrees	**Wald**	**p**
Constant term	1	1.41825	0.233692
Complainant	1	39.09295	0.000000
Allegation	3	11.18049	0.010789

Source: own calculations.

the relations between the variables indicated previously, important for the purpose of the study. In addition, the ROC curve was determined, for which the area under the curve is 0.681 and it is significantly greater than 0.5, which proves the correctness and good quality of the constructed model.

On the basis of the results obtained, it can be seen that there is a significant link between the effect of repeal of the act and the complainant, and the higher probability of annulment of the act in the event of procedural allegations and restrictions on development than with insufficient protection. In the estimated models, the accuracy of forecasting the maintenance of the contested act is very high.

4. DISCUSSION

The presented results contribute to the discussion in the literature on the inefficiency of public authorities in the spatial management system. First of all, the importance of the proposed possibility to measure the inefficiency of public authorities should be emphasized. As indicated above, the spatial management systems of different countries are strongly differentiated (Nadin, 2012). In this context, the call by Alfasi and Portugali (2007) for a specific role of law in the resolution of spatial conflicts is particularly relevant. Court-administrative cases on spatial policy instruments can be described as a kind of reflection of spatial conflicts. Thus, the data on court decisions allow to fill a significant research gap: to determine the scale of spatial conflicts, to make their typology, and to verify the way they are solved. All these issues – with particular emphasis on the last one – are important from the perspective of examining the inefficiency of the public authorities (Nowak, 2017). They also allow to assess the role of the courts – both as entities correcting and deepening the inefficiency of public authorities.

Therefore, especially from the perspective of the first mentioned issue, it seems important to propose measures of efficiency relating to this sphere of issues. On the basis of the research carried out, it can be indicated that the role of the courts

as correcting the inefficiency of public authorities to the greatest extent boils down to the procedural errors committed in the drafting of spatial policy instruments at local level, especially when the complainant is the voivode (the body of government administration responsible for verifying the legal quality of the instruments indicated). In addition, studies show the special role played by the Supreme Administrative Court in this regard as the role of the provincial administrative court is similar at the scale of one province (see Nowak et al., 2020).

An important research direction seems to be the adaptation of this methodology to the spatial management systems of other countries and carrying out a similar test. In the context of the Polish spatial planning system, however, the latter, for changing the negative role of the courts related to the deepening of spatial chaos, requires in-depth attention. This means maintaining planning instruments which deepen spatial chaos. In this context, however, a qualitative analysis will be crucial (as a basis for further assumptions).

SUMMARY AND CONCLUSIONS

Based on the conducted research, it can be indicated that the decisions of the Supreme Administrative Court regarding acts of spatial policy should be taken into account when determining the malfunction of public authorities. It should be stipulated, however, that the analysis in question can guarantee only a partial verification in this respect, based primarily on formal and organizational criteria. To a much lesser extent, the direct effects on spatial order can be detailed here (and it should be recalled that spatial chaos and its effects are the main problems of the spatial management system in Poland). However, this does not change the fact that the above also provides very important information. As a rule, a significant number of annulments of planning acts exacerbates the disorder in local spatial policy, increasing the sphere of speculative decisions and actions. This is confirmed by the results, according to which the number of complaints about planning acts (and thus spatial conflicts, in which participants are ready to apply various methods of operation) is gradually increasing. In this context, the mere possibility of seriously challenging a planning act deepens the negative processes.

It should also be noted here that there is a much greater chance of challenging the planning acts in the event of procedural allegations or those related to the restriction of property rights than in the case of allegations related to a violation of the spatial order by a given act. This confirms that in the current system, considerations related to the protection of spatial order are not sufficiently taken into account in the legal regulations – which, moreover, leads to the correct theses (directed from an urban perspective) about the regulatory weakness of the system. The situation cannot be changed by the attitude of specific panels of courts that operate within the law, however it should be positively assessed that the supervisory authorities are much more effective in filing the complaints. Their argument (as opposed to the allegations

raised by the property owners) is not related to the will (right or wrong – depending on the case) of forcing the possibility of specific development. The operation of these bodies is related more to the substantive assessment of the planning acts, especially in terms of their content and procedural correctness. Obviously, there are cases in which the position of the supervisory authorities arouses serious controversy from the perspective of spatial order protection, nevertheless they can still be considered as correcting to the widest extent the errors of local authorities, and hence as indicative and correcting manifestations of the malfunction of these authorities.

Yet there is no doubt that the malfunction of public authorities in the spatial management system will not be severely limited with the scope of the declarations of invalidity of planning acts as significant as now (which is not the responsibility of the courts or supervisory authorities, but the central and local authorities). The eventual systemic changes must therefore take into account the limitation of these situations, hence the research methods proposed in the paper should be taken into consideration, also in monitoring conducted within the spatial management system.

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