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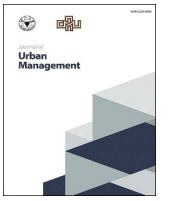

Research Article

Modelling the conflict dynamics behind urban public green spaces as a Network of Action Situations: The case of Bucharest

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ABSTRACT

The governance of urban public green spaces (UPGS) in Bucharest is characterised by fragmented institutions, contested property regimes, and persistent conflicts that have intensified since the post-communist transition. This study applies the Network of Action Situations (NAS) framework, complemented by multilevel-governance (MLG) insights, to map and analyse the complex action situations shaping UPGS management in Romania's capital. Drawing on semi-structured interviews with stakeholders across supranational, national, metropolitan, and district levels, a timeline of perceived critical events and an empirical NAS model of the current governance system is constructed. The analysis identifies three high-connectivity, high-feasibility leverage points: (i) strengthening public-private partnerships, (ii) establishing a comprehensive city-wide UPGS inventory linked to an updated General Urban Plan, and (iii) harmonising legal provisions with robust, updated databases. An improved NAS model incorporating these interventions demonstrates how targeted coordination can break stalemates and enhance the resilience of green-space governance. The findings highlight the utility of NAS for uncovering systemic deficiencies in urban environmental governance and provide transferable guidance for other metropolitan contexts facing similar green space conflicts. Implications for policy, planning practice, and future research on integrated urban green infrastructure are discussed.

1. Introduction

Urban space is inherently a contested arena due to its conflictual nature (Schreiber-Barsch, 2017), which stems from concentrated population and limited resources, creating intense competition among inhabitants (Haaland & van den Bosch, 2015). Urban areas are among the most vulnerable to climate change, experiencing increased natural hazards, water scarcity, and the heat island effect, which disproportionately affect citizens (Yuan et al., 2025; Kumar, 2021). Paradoxically, while urbanisation contributes to climate change, urban spaces also have the potential to be key elements in combating its effects (Powell, 2022). Urban public green spaces (UPGS) are vital due to their provision of essential benefits such as recreational opportunities and ecosystem services (Tzoulas et al., 2007), serving as crucial habitats for wildlife (Goddard et al., 2014). UPGS form the blue–green infrastructure of urban areas, integrating nature-based solutions that support better stormwater management, reduce urban-heat island effect, increase building energy efficiency, improve air quality, enhance biodiversity, and overall increase urban liveability (Gupta & De, 2024; Koohestani et al., 2025).

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Within urban space, land emerges as a paramount and scarce natural resource (UN-Habitat, 2012). The critical importance of land in shaping the dynamics of urban space is illustrated by its role throughout history as a focal point in various domains, including political debates, compliance with international regulations, power transitions, and family conflicts (Krause & Seidel, 2021). From a political perspective, public spaces within cities are seen as arenas that serve as crucibles for the expression of divergent interests, reflecting wider societal tensions and dynamics (Mela, 2014). Moreover, the question of ''publicity'' surrounding these spaces has sparked contentious debates among citizens, centred on issues of decision-making power and the equitable distribution of their benefits (Lehtovuori, 2016; Li et al., 2022).

While meant for communal use, UPGS remains highly contested, due to its economic impact on individual capital accumulation (De Backer et al., 2016). Foster and Iaione (2015) argue that urban space resembles a common good, much like Common-Pool Resources defined by non-excludability and high subtractability. In the case of green spaces, this would translate into challenging exclusion of people from entering and high rivalry among users (e.g. limited lawn where intensive use quickly wears out the grass, compacts the soil, damages plants, and generates litter) (Colding et al., 2013). These characteristics often lead to conflicts over use (Ostrom, 1990). They emphasise the need for better management of urban space to prevent ''tragedies'' similar to those in Common-Pool Resources, and therefore focus on effective distribution between users and uses (Fennell, 2004).

Avoiding or overcoming such conflicts over use requires not only looking at the governance system in which the green space operates, but also understanding the conflict dynamics present in such systems as *"the source of the conflict's change across time''* (Jones & Metzger, 2016, p. 2). As a more recent conceptual approach, Network of Action Situations (NAS) proves to hold a strong promise for the governance of complex socio-ecological system addressing simultaneously systems' conflict dynamics and Common-Pool Resources (Kimmich, 2013; McGinnis & Ostrom, 2014). Action Situations are defined as *"the social spaces where individuals interact, exchange goods and services, solve problems, dominate one another, or fight"* (Ostrom, 2011, p. 11). The interactive process of individuals (or Actors) leading to conflictual Action Situations ultimately portrays the conflict dynamics. The objective of this study is to explore the usefulness of the Network of Action Situation for addressing complex conflicts regarding the governance of green spaces.

This study chooses Bucharest as a case study for exploring the usefulness of NAS when tackling UPGS governance issues. Empirical data is gathered from spatial samples, using qualitative methods such as expert interviews and coding the findings for modelling the governance system and ultimately drawing the conflictual network behind the UPGS governance. The study aims to identify leverage points that could help break deadlocks and offer pathways to conflict resolution for urban planners. The extreme case of Bucharest is intended to determine the extent to which the patterns of interconnected conflict dynamics can be generalized and may be applicable to similar situations globally.

Managing green spaces in transitioning economies, such as those in Eastern Europe, is complicated by the legacy of centralised control (Svejnar, 2002). Following the collapse of communism in the late 1980s, rapid privatization and a surge of ''turbo-urbanism'' (Vöckler, 2008) resulted in unregulated development. This was further complicated by restitution policies that returned property to former owners (Fisher & Jaffe, 2000). The sudden demand for a new paradigm of property rights has often led to ambiguity regarding the protection, conversion, and overall management of green spaces (Stanilov, 2007). Romania is an extreme example among these transitioning countries, characterised by a long and oppressive interpretation of the communist regime and a tumultuous transition to democracy. Unlike other Eastern European countries, the Romanian regime became increasingly repressive, displaying features more akin to Asian communism than its Eastern European counterparts (Axinte & Borcan, 2010). In 2001, a law allowed for the restitution of urban land confiscated between 1945 and 1989 (Law 10/2001). Paradoxically, despite their origins in land seizures, these green spaces were once legally protected and well maintained (Negruț;iu, 1980). After the 1989 Revolution, uncertainty about property rights created challenges for public understanding and governance intervention (Chiriac et al., 2009). Conflicts arose between restituted owners and real estate developers who pushed for land use conversion of green spaces, and citizens and professionals who opposed it (Dinca, 2023). This polarisation has led to litigation and a loss of quality and quantity in the green space (Păcurar, 2023). Studies link restitution to urbanisation and loss of green space (Petrişor et al., 2021; Scriban et al., 2019), with weakened regulation fuelling the ''tragedy of the commons'' (Farber, 1999). The lack of adequate conflict management is particularly acute in the city of Bucharest (Axinte & Borcan, 2010), where the perceived stalemate in urban development has left the green spaces vulnerable to degradation (Bechir, 2023; Moga, 2012).

The article proceeds as follows: Chapter 1 presents the background of UPGS governance situation in Bucharest as an extreme case study. Chapter 2 provides an overview of the NAS approach as a conceptual framework for analysing the UPGS governance. Chapter 3 outlines the material and methods used to analyse the case study, while Chapter 4 builds on this to model the timeline and current NAS of UPGS governance in Bucharest. Chapter 5 discusses the improved version of UPGS governance system and its leverage points, and the possibilities and limitations of applying the NAS approach to understanding and improving the UPGS governance. Chapter 6 concludes with generalisable lessons for governance and future research.

1.1. Bucharest - a legacy of urban conflicts

Unlike other Eastern European countries, Romania struggled to swiftly shed the shackles of communism. In December 1989, a series of protests and demonstrations culminated in a violent revolution, with the execution of the dictator couple and the death of numerous young revolutionaries (Murgescu, 2007), making it one of the last countries in the region to overthrow the regime. As a result, the period following 1989 was notably tumultuous, with the country grappling with severe economic crises. Gallagher (2010) refers to the years after The Revolution as the *Lost Decade of Romania*, highlighting the profound challenges and setbacks experienced during this time. Indeed, this situation can be attributed to the fact that the Romanian communist regime was not as indulgent to private entrepreneurial initiatives compared to other countries from the Eastern Bloc (Vasiliu, 2018). Consequently, the abrupt shift

from communism to consumerism and the transition of power from the state to the market reinforced the total absence of private companies, supposedly ready to take over, as the necessary social group of entrepreneurs had not yet been formed.

Until 2013, heirs to certain properties, including buildings or land, were entitled to restitution through a validation process overseen by the government. Despite the conclusion of this campaign over a decade ago, the repercussions of its implementation continue to reverberate (Nae & Turnock, 2011). This measure was particularly challenging to implement since it had to deal with the memory of place and of the ownership (González Enríquez et al., 2001), to navigate multiple generations of owners, and to reconcile three completely different governance systems, monarchy-communism-democracy. All these underlying dimensions contributed to ambiguity when discussing property rights.

Bucharest stands out as an extreme case with a percentage of 13,5% of its territory having been solicited for restitution (Stanciu, 2015). Besides historical implications, the environmental quality report published in 2022 highlighted Bucharest as one of the most polluted capitals in the European Union, citing alarming trends in temperature increase, water quality decline, and insufficient climate change adaptation and mitigation efforts (Iojă, 2022). Despite the urgent need for environmental conservation, Bucharest has experienced a significant loss of over 500 ha of green spaces since 1990 (Iojă, 2022). Municipal decisions, favouring economic development (Onose et al., 2023), have further intensified the loss of green spaces, exacerbated by outdated urban documentation that creates legislative voids (Petrişor et al., 2021). While Romania's legal framework, including the Law on UPGS management (Law 24, 2007) and Law on property rights restitution (Law 10, 2001), explicitly prohibits altering the use of restituted green areas, Bucharest has experienced a concerning surge in instances where high buildings seemingly materialize overnight on these spaces (Stanciu, 2015).

Within Bucharest's extreme context, the study selected specific sites as spatial samples with the highest potential for providing rich and diverse data, without comparing them (Fig. 1). This variation approach ensured that insights are not limited to a single UPGS type, but become relevant to more. Therefore, the study focused on parks, waterfronts, and UPGS in the proximity of condominium dwellings built during Communism. This selection criterion was based on the fact that these UPGS types are most fragile to land-use conversion and to ambiguity regarding their property rights (Ivanov, 2014). As concluded in Table 1, none of the cases hold all the criteria considered for the success of the empirical findings, yet they are complementary in the data that they have to offer.

The selection of the spatial samples started with reference to the work of Onose et al. (2023), which helped to hierarchise the largest parks (each over 5 ha) on the basis of the number of conflicts they had recently experienced and been immortalised in the press. The indicators used to quantify conflicts were: competition between land uses, differences between use and expectations, transformation, management, and natural elements. Of the 22 inventoried parks, Herăstrău (official name: King Michael I Park) from District 1 stood

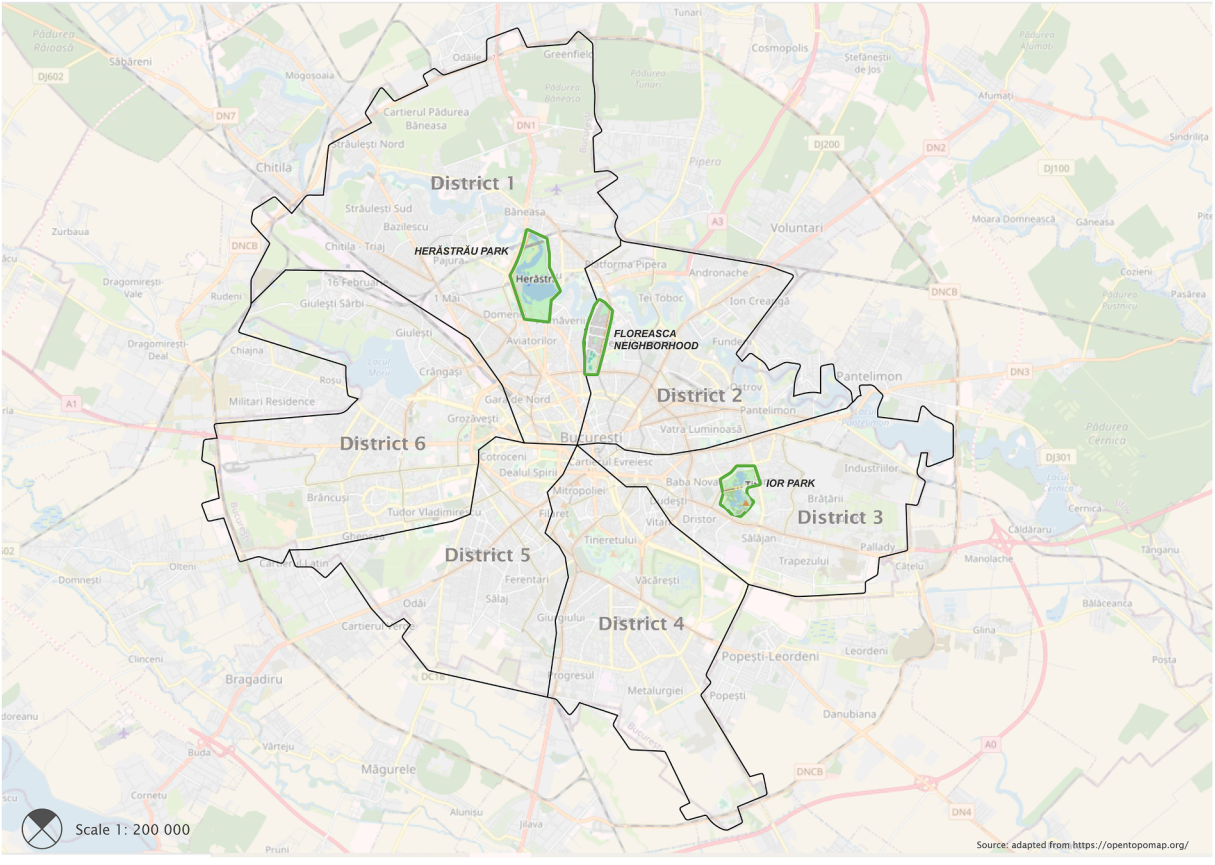

Fig. 1. Plan with the spatial samples from Bucharest divided into districts (author's own work using the base map from opentopomap.org).

Table 1
Selection criteria for spatial samples (author's own work).

Selection criteria for spatial samples	Herăstrău Park	Green spaces from Floreasca Neighborhood	IOR Park
UPGS type	historical park	condominium green space	legally unprotected green space
land-use conflict	yes	yes	yes
most diverse in property rights holders	yes	no	no
active civic group	yes	yes	yes
puzzling outcome	yes	yes	yes
includes most diverse UPGS types	no	no	no
known for being conflictual	yes	yes	yes
representative for other UPGS from its category	yes	yes	yes
built on uncompensated nationalized parcels	no	yes	yes
short description of the most famous conflict	privatization of waterfront, agglomeration of property rights holders	restitution of condominium green spaces and urban densification	restitution of a parcel which was never legally labelled as green space.

out as the park with the highest number of conflicts, making it the most promising spatial sample for collecting adequate data. Nevertheless, Herăstrău is not very representative of other UPGS types, mainly because it was built before Communism and because it has a special legal regime, offered by its status as National Heritage Park (List of Historical Monuments, 2016), which (should) secures more legal protection compared to other UPGS types.

For this reason, another type of UPGS is included in the study, representing green spaces in the vicinity of collective housing built during the socialist era. Since a large area of Bucharest was systematised, collective housing projects are common even in the centre of the city. An illustrative case is the Floreasca neighborhood, built in 1957 in District 2, which was designed to accommodate abundant green spaces between the apartment blocks (Stroe, 2015). This asset quickly attracted private investors, and once the Law on property rights restitution was in place, the green spaces were returned to the former owners, sold to real estate companies, and converted into built spaces, to the detriment of the current neighbours.

Although both Herăstrău and Floreasca are highly representative of their respective UPGS typologies, benefiting from legal protection and allowing civic groups to seek judicial intervention (Goțiu, 2024), the situation is different for green spaces without such protection. A park that is currently the most discussed in the mass media is the IOR Park (official name: Alexandru Ioan Cuza Park) in District 3. This park gained considerable attention when an impressive 12-ha parcel of land was restituted. This particular area had never been legally designated as an UPGS (Ivanov, 2022), which meant that it did not have the legal protection typically afforded to such spaces, despite being included in the original socialist project. This parcel becomes representative of all the green spaces that, although recognised by the community, managed by the City Hall and subject to systematisation during the socialist era, still suffer from the legislative gap of not having their legal status updated as UPGS, making them extremely vulnerable to land use conversion (Redacția Financiarul, 2022). By selecting this spatial sample, the study also sought to address green spaces with unclear property status and to look beyond legal methods of conflict resolution, as green spaces cannot always benefit from them.

2. Network of Action Situations

The Network of Action Situations (NAS) approach is an interdisciplinary conceptual framework that brings together the Institutional Analysis and Development framework (McGinnis, 2011c) and the Social-Ecological Systems framework (McGinnis & Ostrom, 2014). Both frameworks are generally regarded as state-of-the-art for the analysis of resource governance issues and provide robust tools for elucidating the processes through which actors can potentially resolve disputed resource claims and the factors that influence such resolutions, factors that can be traced outside the local context of the conflict. Although not fully standardised, NAS capitalises on the established strengths of the above-mentioned frameworks and expands their analytical scope to reveal different interrelated biophysical, economic, and political decision-making situations, and therefore has the added potential to capture complexity (Kimmich, Ehlers, et al., 2023).

Recent advances in NAS approaches have focused on different case studies, such as: fisheries management (McGinnis, 2011b), tele-coupled resource systems (Boillat et al., 2018), energy infrastructure policy (Gritsenko, 2018), or water use coordination (Dennis & Brondízio, 2020). However, existing studies indicate that the application of the NAS approach to UPGS is still scarce and methodologically under-developed. This allowed this study to use certain heuristics and interpretations of the NAS approach, taking into account the crucial importance of avoiding rigidly limited NAS boundaries, as distant Action Situations can have a significant impact on a case (Ortiz-Riomalo et al., 2023).

This study interprets conflictual Action Situations (AS) as the empirical translation of conflict dynamics in the system, recognising that conflictual AS contain specific dynamics of interest for this research. Referring to them as situations implies that the *Actions* within them recur, and that AS do not necessarily dissipate independently over time (McGinnis, 2011a), such examples can be outdated professional practices or unclear regulations. NAS argues that the temporal aspect of relationships between AS is crucial to understanding the governance challenges posed by co-evolving sustainability issues (Baldwin et al., 2022). *Outcomes* within NAS are

conflicts leading either to hindering the process of real estate development or of UPGS protection. When analysing the *Actors* involved in the conflictual AS, the study adheres to the same typology as the holders of property rights of Common-Pool Resources (Ostrom, 1990).

Additionally, NAS is defined by its ability to encompass and highlight the linkages between multiple Action Situations. All elements of the governance system surrounding the UPGS are connected through certain linkages (Fig. 2). For the context of this study, *Linkages* are expressed as the relation of interdependency or commonality among *Actions*, whereas *Meta-linkages* express the same relation, but for *Action Situations*. Meta-linkages are depicted as the empirical translation of how driving forces navigate within the system.

Some studies combine NAS with other theoretical frameworks. One such study is conducted by Oberhauser et al. (2023) where NAS is intertwined with the political economy concept of the "social contract'' in order to gain a better understanding of power and institutional dynamics. More relevant for finding solutions to prevent or resolve stalemates in the UPGS governance, however, seems to be Kellner's (2022) approach, which successfully integrates NAS with systems thinking to identify leverage points that could steer the water-energy-food nexus towards sustainability. In doing so, she goes beyond simply mapping the levels of governance intervention and increases the precision of her management recommendations by identifying leverage points.

As the Network of Action Situations lacks a predefined governance structure (Kimmich, Baldwin, et al., 2023), this study evaluates Multi-Level Governance (MLG) as a promising framework to provide the structural context. At a general level, MLG is helpful in examining the difficulties of top-down government strategies or why local governance is not always aligned with regional, national or international policies and objectives (Partelow et al., 2020). By grafting NAS onto MLG, the conceptual model (Fig. 2) can be used to trace the linkages between different components of AS and ultimately identify Meta-linkages across different levels of governance. Furthermore, as this study focuses on urban space, where most metropolises are organised into districts, the levels of MLG are adapted to the context of a metropolis, with the lowest level of potential governance intervention being the district level. NAS continues to provide important insights into the dynamics of interaction and coordination within system's conflict dynamics.

While understanding the levels of governance within the MLG is crucial to grasping the structure of the system, the ability to identify interventions that require minimal effort yet have maximum impact is also essential for setting priorities and formulating practical governance recommendations. This study therefore sets out to identify such intervention points. The key difference between general NAS improvement and the identification of leverage points is the precision and targeted impact of the latter. A systemic perspective is essential for understanding the underlying factors, but without clear prioritisation, government officials may struggle to decide where to start and which aspects to focus on, potentially stalling the transformation process. Precise identification of potential improvements, or leverage points, can therefore facilitate the smoother integration of analytical insights into governance practices. Leverage points are extracted from the whole NAS and represent the least effort needed to destabilize the governance system and to recompose it with the maximum beneficial impact. However, it is important to recognise that these leverage points are inherently fragile. Their vulnerability stems from their nature as small but highly interconnected components within the broader system. Their interconnectedness also makes them more susceptible to disruptions that could undermine their effectiveness and the overall governance framework they seek to improve. Recognising both the limitations and practical necessity of the leverage points framework, the current study will focus on identifying leverage points based solely on their high connectivity and feasibility within NAS.

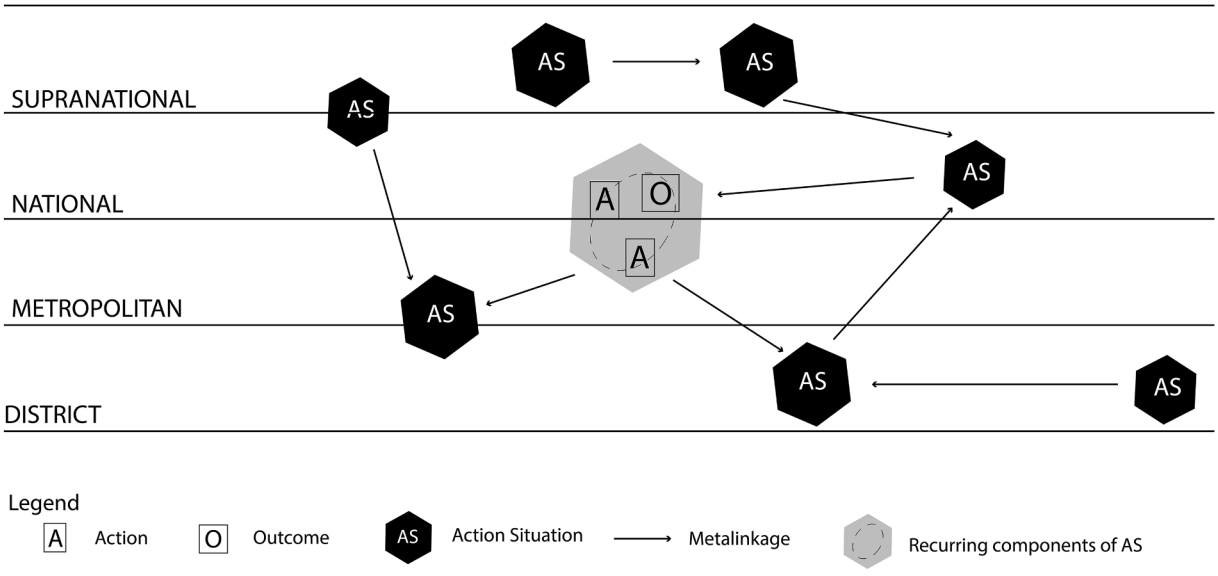

Fig. 2. Conceptual Model of Network of Action Situation combined with Multi-Level Governance for Urban Public Green Space. This figure shows how ASs navigate across the governance levels in an interconnected manner. It also exemplifies (in grey) the components (author's own work).

3. Methods

Due to limited empirical research available on the chosen topic, this study relied on the collection of primary data using a qualitative approach. To this end, in-depth semi-structured interviews with open-ended questions were conducted. In total, 12 stakeholders were interviewed (Table 2).

The experts were selected based on three criteria: (i) their position within the institution (preferably as high as possible, to ensure a broad institutional perspective); (ii) the representativeness of the entity they belong to, so that it directly interacts with UPGS; and (iii) the governance level at which they operate. An additional level, the community level, was included in the methodology to ensure representativeness of the local communities surrounding the spatial samples. In the results section, these three communities, together with the municipal representatives from each district, construct the conceptual district level shown in Fig. 2.

The final coding scheme comprises the parent codes identified during the testing stage on newspapers (Fig. 3). The input of the interviewees was grouped under these parent codes, which were then expanded into subcodes derived from the interview data. Applying the coding scheme involved manually searching the transcripts for meanings or phrases that suggested the codes. This process was facilitated using MAXQDA. One code can represent multiple ideas. For instance, the *District* code, which was derived from the parent code *Governance Levels*, appeared in various contexts within a single transcript. When the same idea was repeated more than once, it was coded only once per interview. Therefore, a code's frequency represents how many times it appears across all transcripts, regardless of how many times the same idea is repeated within a single interview.

Since the same people were mentioned in each interview, the number of Actors is low (Fig. 4). Annex 1 illustrates the identified actors in relation to Ostrom's bundle of rights. The owners are divided into private and public landowners. The private owners are either individuals who own a small plot of land of a few hundred square metres or the real estate who owns larger plots of land, often in key areas of the city. The *owner* is the Bucharest City Hall, which owns most of the UPGS. The *poprietors* are mainly: the district municipalities, which are delegated by the City Hall to manage their UPGS, such as the green areas in Floreasca and the IOR Park; ALPAB (Bucharest Lakes, Parks and Leisure Administration), which is the state company delegated by the City Hall to manage the city's parks, such as Herăstrău Park; Romanian Waters, which is the national agency for the management of waters of national importance, such as Herăstrău Lake. The *claimants* are comprised of either small companies which signed maintenance contracts with the proprietor, or renting contracts to run various economic activities, such as inflatable playgrounds in IOR Park or restaurants in Herăstrău Park. The *authorized user* is portrayed by the communities living in the area of these UPGS, but also by every other citizen of Bucharest.

The governance levels are mainly represented by the normative acts that the interviewees mentioned, indicating a strong mental correlation between policy making and governance. The high number of codes is due to the study's allocation of a subcode for each legislative piece that was mentioned at least once. Regarding the Outcome, the majority of results indicate conflicts that hinder UPGS protection, with only two mentions of Outcomes that impede real estate development. This strong consensus among interviewees suggests that the need for UPGS protection is strongly felt by the actors. Regarding the Linkages, the interviewees offered valuable links among Actions, most of them in the form of dependencies, which later contributed to the construction of Meta-linkages in the Network of Action Situations.

Regarding the Actions, most of the sub-codes fall into this category. As shown in Annex 1, some actions were grouped according to their domain, such as public administration, legislation, urban planning, justice, low qualitative UPGS, and practice. Thematic coding was extremely useful for grouping information into themes, which greatly facilitated the process of identifying actions from similar domains. The difference between the simple categorisation of the parent codes into themes and the actual construction of Action Situations (AS) lies in the flexibility of the latter to include codes from different domains. For example, the domain of urban planning

Table 2
Final sample of interviewed stakeholders. The anonymity label given to each expert was chosen in relation to the governance level that they represent (author's own work).

Profession	Organization	Department	Governance Level
Landscape Architect	International Federation of Landscape Architects	European Branch	Supranational
Architect	Ministry of Regional Development and Public Administration	Technical Directorate of Urbanism within General Directorate of Regional Development and Infrastructure	National
Economist	City Hall of Bucharest	Bucharest Lakes, Parks and Leisure Administration	Metropolitan
Architect	County Council of Ilfov	Chief Architect	District 1 and Metropolitan
Architect	City Hall of District 2	Chief Architect	District 2
Architect	City Hall of District 3	Chief Architect	District 3
Citizen	Herăstrău Park Civic Group (informal)	-	Herăstrău Community
Citizen	Floreasca Civic Group	-	Floreasca Community
Citizen	one of the IOR-Titan Park Civic Groups (Romanian Name: aici a fost o pădure/aici ar putea fi o pădure)	-	IOR Community
Citizen	Eco-civica (NGO)	-	Metropolitan
Geographer	City Hall of Bucharest	Technical Board of Urban Planning	Metropolitan
Lawyer	-	-	National and Metropolitan

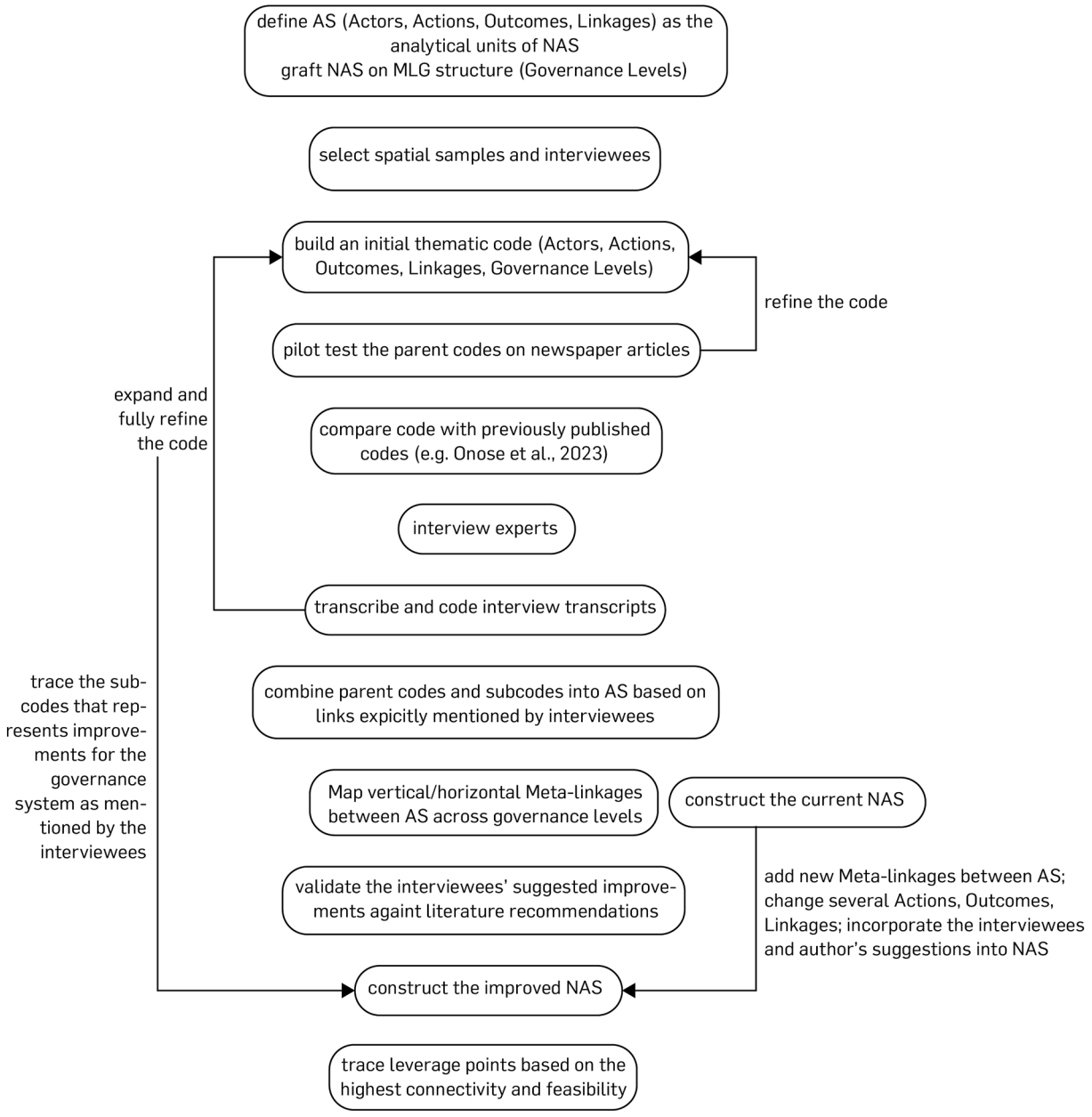

Fig. 3. Workflow (author's own work).

hosts the code of missing or incomplete databases, which is linked to the domain of justice, more specifically, to the code of difficulty in tracing the legal status of a parcel.

To identify the most relevant Action Situations, these were delineated based on the connectivity described by interviewees, namely the linkages between Actions, Actors, Outcomes and Governance Levels, and on the feasibility score. These scores were not derived using a fixed numerical formula or algorithm, but qualitative. Firstly, Meta-linkages were counted: the greater the number of vertical and horizontal Meta-linkages an AS possesses, the higher its connectivity score. Secondly, a qualitative assessment was conducted, primarily based on the interviewees' input and, to a lesser extent, the author's judgement following a literature review. This feasibility review validated the information provided by the interviewees by checking the accuracy of dates, referenced law articles and reported impacts as documented in books, scientific articles and newspaper sources. The same two scores were applied when referring to the improved ASs from the second stage of modelling. The feasibility score was taken one step further to reflect how easily an intervention could be implemented (e.g. whether it could be carried out by existing institutions), as determined by the author's literature review.

In this way, 14 Action Situations were identifies as the most influential: (AS1) Non-existent EU Directive; (AS2) OUG 114/2007 on more conditions for environmental protection; (AS3) Law 24/2007 on UPGS management; (AS4) The Forestry Code; (AS5) Law

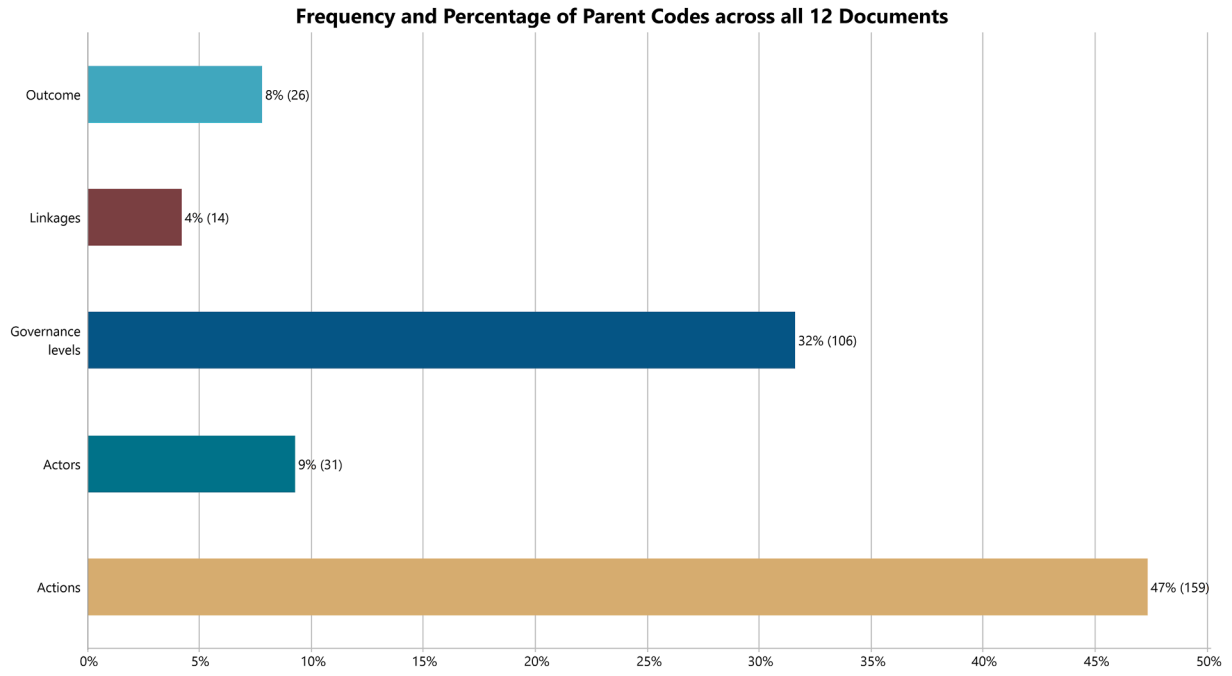

Fig. 4. Frequency and percentage of parent codes across all 12 interviews (author's own work).

October 2001 on property rights restitution; (AS6) Outdated PUG (General Urban Plan); (AS7) Reduced capacity of local public administration; (AS8) Absent local UPGS inventory; (AS9) Biased local council; (AS10) Excluded local communities; (AS11) Litigious disputes; (AS12) Absent or outdated data bases; (AS13) Strong informal cooperation between real estate and public authorities; (AS14) Misaligned mentality.

The construction of a timeline of relevant events, as perceived by the interviewed experts exclusively, was considered as an essential precursor to constructing of the AS, and of the NAS model. The aim was to improve the understanding of the temporal aspect, identified in the Introduction section as a crucial indicator for understanding the conflict dynamics behind the UPGS of Bucharest. Thus, a subjective interpretation of relevant events was developed, reflecting how the interviewees constructed the timeline. Although such a timeline could have been created more objectively by documenting accurate historical events, the authenticity of this subjective timeline reveals how actors involved in the conflicts and experts experience these events. During the interviews, the author allowed the interviewees to prioritise and identify the relevant events themselves, so the events are important for understanding the participants' perceptions of the duration aspect of these conflict dynamics. The actual compilation of the timeline includes both specific events as well as periods of time, which were recorded as faithfully as they were described by the interviewees. The delineation and description of these periods are particularly interesting, as they clearly show how certain decisions were felt and the lasting effects they have.

4. Results

4.1. Perceived timeline of relevant events

The chronology of events surrounding the governance of the urban public green space (UPGS) in Bucharest, as perceived by the experts, is summarised in Fig. 5.

According to all the interviews, in the aftermath of The Revolution, a wave of privatization of natural resources emerged and lasted until the early 2000s when Romania began the accession to the European Union. During this period, various regulatory normative acts were introduced, culminating in 2007 with several acts addressing UPGS issues for the first time. The majority of events were taking place at National level until the mid-2010s, when numerous civic groups emerged, including those representing the communities from the spatial samples of this study.

Participants' insights into the temporal aspects of conflicts were crucial, given that the effects of many conflicts are still being felt today. Although the timeline in Fig. 5 does not necessarily indicate a clear future direction for UPGS governance, it does show that there are several normative acts that either protect or compromise UPGS quality and quantity.

In terms of the reversibility of events, Table 3 links the key governance shifts mentioned by the interviewees to the corresponding Action Situation nodes. Some governance shifts could be linked to more than one AS node (e.g., the rise of civic groups influences AS10, Excluded local communities; AS11, Litigious disputes; and AS14, Misaligned mentality). Several AS nodes (e.g., AS11, Litigious disputes; AS12, Absent or outdated databases) are systemic background nodes that persist across all periods and can therefore be attached to multiple events and AS.

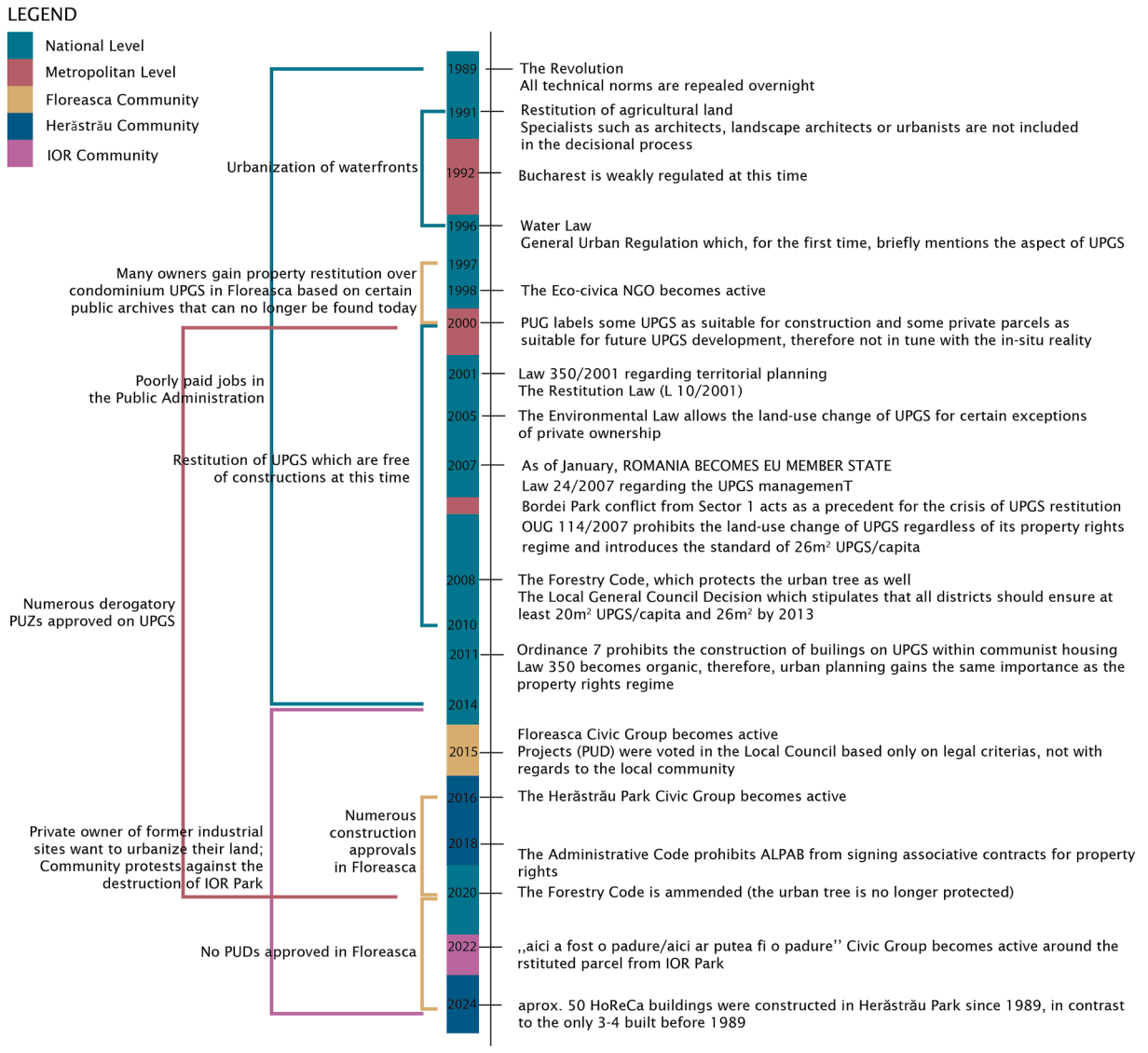

Fig. 5. Perceived timeline of the most relevant events as mentioned by the interviewees. The right side of the timeline punctually marks events, whereas, the left side traces periods of time (author's own work).

No definitive shift has occurred, leaving the possibility for the current NAS to evolve towards a less conflictual scenario. The open-ended nature of this timeline signifies that UPGS governance remains a high priority for all the actors involved. It aligns with the varied responses of the interviewees, who frequently demonstrate determination to shift UPGS governance towards their respective agendas.

Although, certain historical events are not explicitly included in the current NAS model, it was essential to acknowledge them in this timeline for the initial construction of AS. For example, although land restitution is no longer taking place, its effects remain significant, as do the restitution commissions within local councils that once made these decisions. Although both Actions are now in the past, they continue to exert considerable influence on the current governance system. Consequently, certain outcomes, such as the in-kind restitution of land deemed to be of public interest (AS 5), are now irreversible, since much of it has already been built on. This suggests that the focus should shift away from lingering land disputes to adopting sustainable urban development practices for the future.

4.2. Model of the Current Network of Action Situations

The modelling of the current governance of UPGS in Bucharest as a NAS corroborates the initial assumptions from the literature review and confirms the systemic nature of the problem, where elements are intricately interconnected. This modelling stage is based solely on the interviewees input without later feedback from them. As shown in Fig. 6, the impact pathways, namely the Meta-linkages, operate both vertically and horizontally, indicating a non-linear system. It also shows that the AS are not dependent on the levels of

Table 3
Key governance shifts in Bucharest's UPGS governance based on the perceived timeline and on the identified Action Situations (author's own work).

Perceived Timeline	Key Governance Shift	Reversible/Irreversible Outcome	Action Situations Node(s)	How the Shift is Reflected in the current Network of Action Situations
The 1990s and early 2000s: post-Revolution privatization wave	Massive "in-kind'' transfer of formerly state-owned UPGS to private "restituted" owners	Irreversible – many parcels were built on; the physical loss of green area cannot be reclaimed	(AS5) Law October 2001 on property rights restitution	This AS sits at the national level with Meta-linkages that cut across the metropolitan and district levels. It generates a dense cluster of conflictual outcomes with lasting effect even nowadays
1995 – 2007: EU accession preparation	Introduction of a series of normative acts (e.g. Law 24/2007 on UPGS management) that formalised protection but also created ambiguities	Partially reversible – legal texts can be amended, but the built-up consequences of earlier disposals remain	(AS3) Law 24/2007 on UPGS management; (AS6) Outdated PUG (General Urban Plan); (AS8) Absent local UPGS inventory; (AS12) Absent or outdated data bases	These AS appear at the metropolitan and district level and link vertically to national legislation (AS5, AS3) and horizontally to local authorities' capacity (AS7). AS3 cannot properly function without updated AS6, AS8, AS12, the latter ones making AS3 ambiguous, therefore AS5 was able to do in-kind restitution of UPGS
Mid-2010s: rise of civic groups	New civic groups that live around UPGS emerge, demanding participation; however, institutional channels remain weak	Reversible – strengthening community participation can change decision and make new pathways	(AS10) Excluded local communities; (AS11) Litigious disputes; (AS14) Misaligned mentality	These AS sit at the district level. Their Meta-linkages connect upward to national law (AS2, AS3, AS4, AS5) by setting precedents to legal interpretations and downward to local implementation (AS7)
2020: Forestry Code amendment removing the urban tree	Removes urban tree as a criminal offence, undoing a previous safeguard	Irreversible for the trees already cut; reversible for future protection if the code is amended again	(AS4) The Forestry Code	This AS now has a negative Meta-linkage to all other AS that aim to protect UPGS (AS7, AS8, AS10).
2000 – 2020s: derogatory urbanism	Numerous permits were issued by municipalities as exceptions to bidding laws, allowing construction on UPGS	Irreversible for the UPGS already built on; reversible for the UPGS not yet built on. This process is politically risky	(AS7) Reduced capacity of local public administration; (AS9) Biased local council; (AS13) Strong informal cooperation between real estate and public authorities	These AS are connected vertically and horizontally to the outdated AS6, AS8, AS12 which led to the derogatory urbanism. Further on, AS7, AS9, AS13 contribute to the exclusion of local communities from the decisional process

governance, and in fact four of the AS manage to cut across all levels, indicating their strong influence. While the supranational level is distinct from the rest, the national, metropolitan and district levels tend to be intertwined. This is a clear indication that the driving forces behind the conflict dynamics in the system are not perceived as a direct cause of supranational activity, but rather that complexity increases at the metropolitan and district levels.

5. Discussion

5.1. Model of improved UPGS governance system

The existing NAS model of UPGS governance in Bucharest, initially developed solely on the basis of expert interviews, was subsequently revised. In a second stage of NAS modelling, experts' suggestions for improvement were first systematically incorporated, followed by insights drawn from the literature, including findings from studies addressing similar governance challenges in other cities. This stage of the modelling process opens a discussion on the potential of NAS to contribute to overcoming the governance deadlock currently affecting UPGS in Bucharest. The improved NAS model was not validated with the interviewees.

Compared to the current NAS (Fig. 6), the improved version shown in Fig. 7 introduces more Meta-linkages between ASs and their components. The new NAS shows that the interviewees' suggestions, together with recommendations from other studies, creates a network that focuses on improvement rather than conflict. The new Meta-linkages build on the existing ones and extend to more components within the system, facilitating smoother transformation. Some conflictual outcomes remain unresolved, mainly because the improved NAS aims to be realistic about certain subjective aspects, such as different interpretations of laws. This diversity is expected to continue as a fundamental aspect of a democratic system that allows for differing opinions. In the case of legislation, the goal of the improved NAS is to reduce the number of conflicting legal interpretations that impede UPGS protection, focusing on reduction as a more achievable goal rather than an unrealistic expectation of uniform legal interpretation.

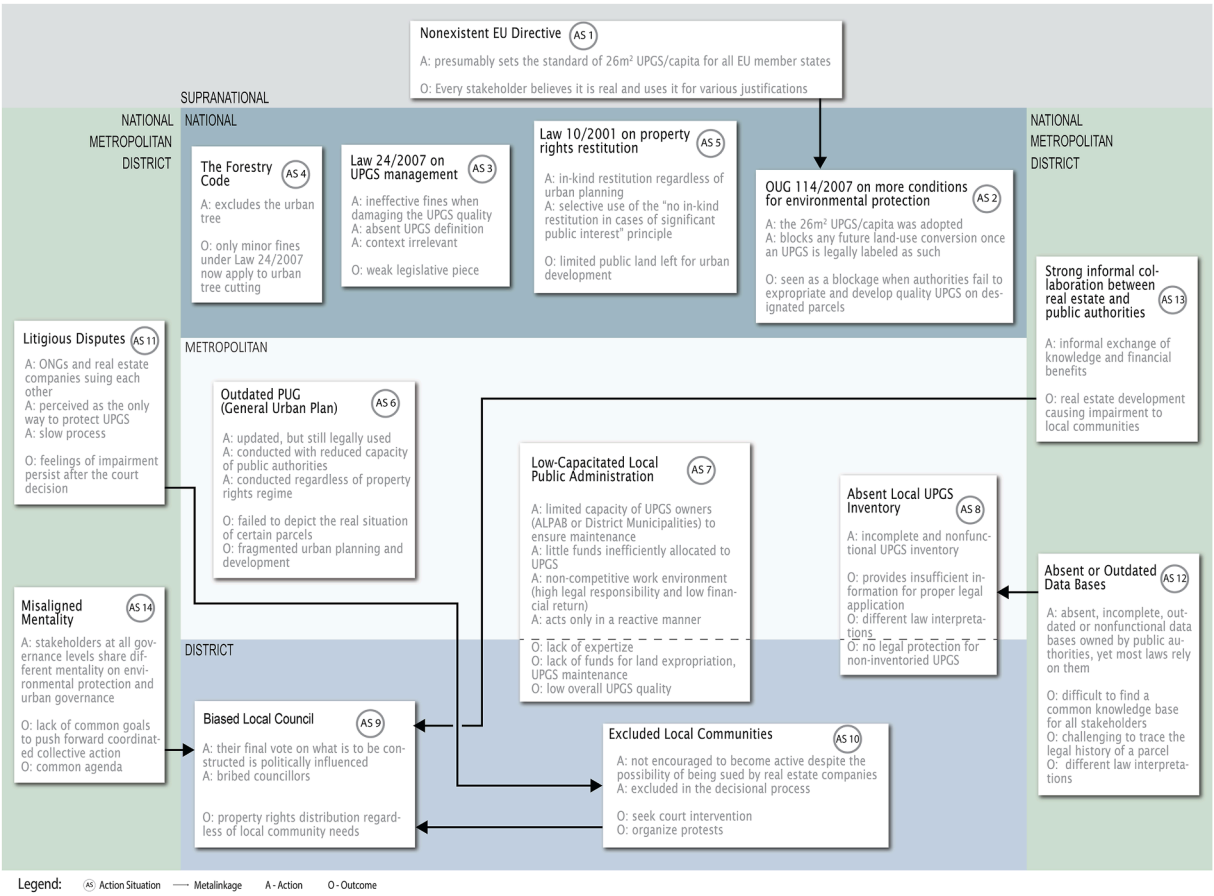

Fig. 6. Current Network of Action Situations (NAS) for the governance of Urban Public Green Spaces (UPGS) in Bucharest. This figure shows the components of each Action Situation and the Meta-linkages that connect them across governance levels (author's own work). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

5.2. Leverage points for improving UPGS governance

An analysis of the Meta-linkages of the AS in the improved NAS model, based on the experts' suggestions and the literature, reveals three leverage points as the most suitable interventions to overcome the stalemate in the UPGS governance of Bucharest: (AS13) Public-private partnerships with (AS7) Local public administration; (AS8) Local UPGS inventory with (AS6) Updated PUG; and (AS3) Law 24/2007 on UPGS management with (AS12) Updated data bases.

Applying the criteria of high connectivity and feasibility, the first leverage point identified is the strengthening of public-private partnerships, which has the potential to significantly enhance the capacity of public administration through shared responsibilities. The private sector, with its advanced knowledge of technologies and best practices in UPGS management, could play a key role in improving governance outcomes. However, the effectiveness of these partnerships depends on the legal obligations of public authorities to implement or exploit the results. While there are currently numerous public-private partnerships in Romanian cities, such as the development of best practice guidelines and the organisation of workshops for public administration staff, their impact is often limited by insufficient follow-up.

The second leverage point is the continuous update of the local UPGS inventory. This process should go beyond mere updates to include improvements in the regulatory framework for the compilation of this database. Accurate and up-to-date data are fundamental to effective management. Without a comprehensive understanding of existing resources, municipalities are unlikely to formulate adequate management plans for their green infrastructure. An updated UPGS inventory would greatly facilitate the revision of the general urban plan (the Romanian acronym "PUG''). PUG is a comprehensive document that envisions the long-term development of the metropolitan area of Bucharest. An updated PUG is critical, as underlined by all of the interviewees, as it underpins all urban planning tools and regulations. The current PUG update process, initiated by the City Hall in 2013, has faced major challenges in reaching completion due to shortcomings identified in this study as well and is therefore highly anticipated by all stakeholders.

A third leverage point is the ongoing project to amend Law 24/2007 on UPGS management. Although, currently stalled in the legislative process, this project has the potential to significantly influence the management of the UPGS at national level. Originally drafted by mainly landscape architects, the law has undergone amendments that shifted its original focus on UPGS protection. If

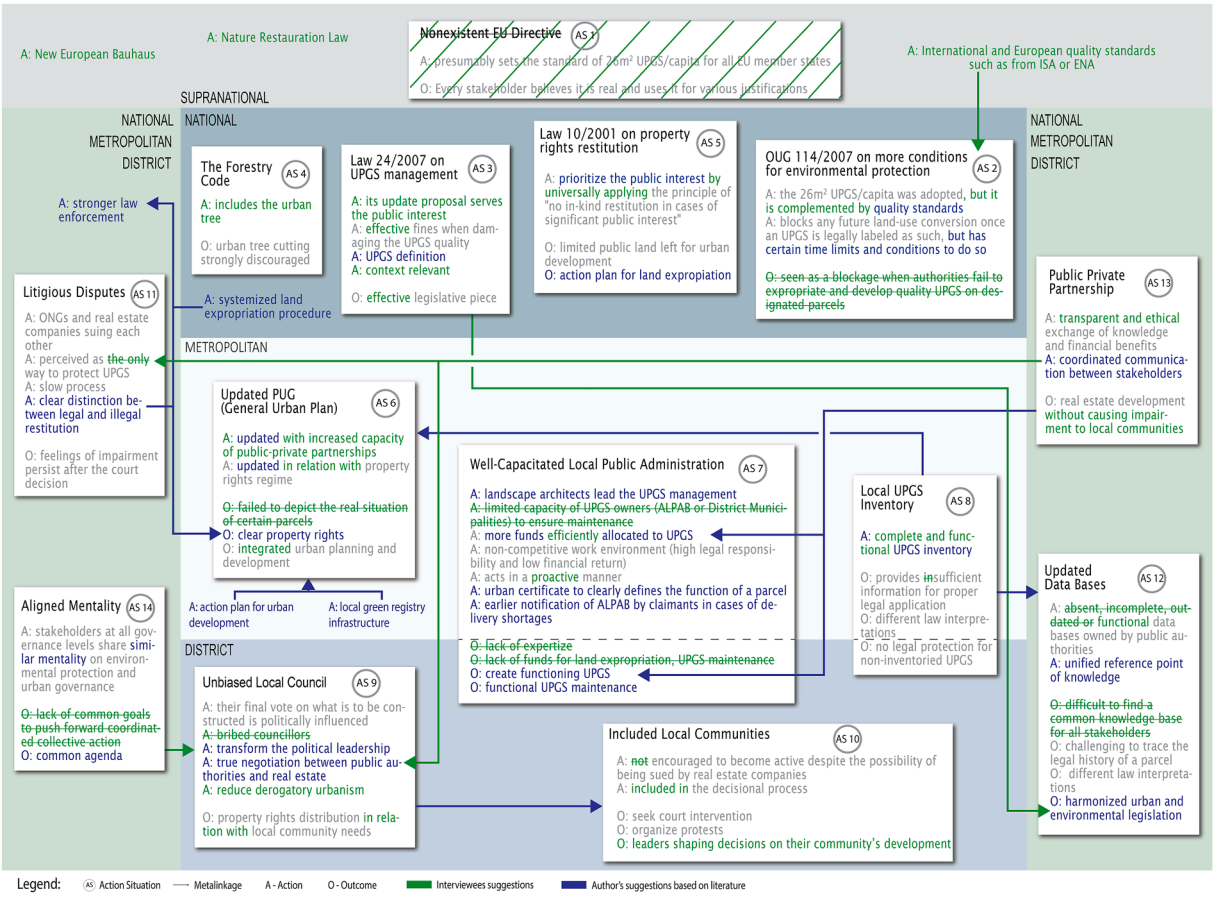

Fig. 7. Improved NAS for UPGS governance in Bucharest. Changes highlighted in blue represent the interviewees' suggestions, while those in green reflect the author's recommendations based on reviewed literature. The latter suggestions build on the interviewees' input but take it further by integrating best practices from other studies or cities that have successfully addressed similar challenges (author's own work). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

revised appropriately, this legislation could clarify existing ambiguities in UPGS management and impose more stringent legal requirements for enforcement. Reducing ambiguities in the interpretation of this law can also be supported by updated databases to which the law refers.

5.3. *Usefulness of NAS in analysing conflict dynamics*

Modelling NAS clearly shows that the UPGS governance problem in Bucharest is systemic. Despite rigorous examination, no individual Action Situation was identified as being significantly problematic. Instead, it was determined that all ASs hold equal weight in establishing the network. Taking a systemic approach, as exemplified by NAS, was beneficial in moving beyond a narrow focus on individual conflicts and achieving a thorough understanding of the intricacies inherent within the UPGS governance system as a whole. This approach also enabled the identification of the interconnected domains that exert influence on such a non-linear system. This finding is consistent with the prevailing academic consensus on conflict management in the context of urban green spaces, which emphasises the importance for systemic approaches. As Wagner et al. (2019, p. 14) note, *"the stakeholders involved in planning processes – i.e., citizens, administration, politicians and external service providers – are rarely considered together"*. The application of the NAS approach was instrumental in elucidating the intricate interconnections between diverse conflicts. Its remarkable capacity to incorporate complexity is noteworthy, as is its ability to reveal interlinkages across different governance levels and fields of activity that would otherwise have remained invisible if these had been examined in isolation.

These interlinkages, although not fully emphasised in Ostrom's theory, played a significant role in modelling the current NAS. Future studies are strongly encouraged to focus on them, as they have considerable potential to improve our understanding of conflict dynamics. Furthermore, the present study demonstrates that a NAS approach is potent enough to facilitate the identification of leverage points within a UPGS governance system. The concept of leverage points was deliberately incorporated to assist practitioners to identify a starting point, which is often difficult when dealing with systemic issues. Although these leverage points are intended to be at the forefront of the transformative process for improving the overall governance, they merely represent the initial steps. According

to the perceived timeline, now is still an appropriate time to initiate these efforts, in order to maintain a chance of achieving a less conflictual scenario for UPGS governance in Bucharest.

The Romanian governance system, including the legislative, judicial and administrative systems, views UPGS as either private or public. This strict duality made it difficult for the study to accurately map the actors mentioned in the interviews in relation to Ostrom's types of property rights holders, which typically refer to situations where the good is common or has unknown property rights. Therefore, the Common-Pool Resource framework is not entirely suitable for mapping the actors and property-right arrangements that characterise Romanian (and many other) UPGS contexts. Adopting the structural lens from MLG increased the resilience of the study and avoided potential pitfalls. The current NAS of UPGS governance in Bucharest was highly action-oriented, demonstrating that NAS is more effective in unfolding conflictual Actions than in describing different characteristics of Actors. Therefore, future NAS studies could develop this aspect of the framework to better illustrate how actions depend on the actors involved.

In terms of methodological limitations, NAS is biased by the power imbalances inherent in the interview-driven stage of data collection. In the Bucharest case, for example, the resulting network favours well-represented, formal actors and may overlook or undervalue the influence of groups silenced by the conflict. If these hidden actors were incorporated, the mapping of ASs, and consequently the identification of high-connectivity, high-feasibility leverage points, could look markedly different. To address this bias, it is necessary to expand the stakeholder base, triangulate with alternative data sources, and explicitly test the impact of omitted actors on the network structure. Reducing bias in future NAS studies could be achieved by broadening the sampling frame, triangulating data sources, and combining qualitative and quantitative approaches (for example, using precise algorithms to calculate connectivity and feasibility scores). Methods such as larger snowball sampling, focus groups, and community workshops can help to include informal or less visible actors. Meanwhile, document analysis, GIS data, and participatory mapping can support the identification of absent or silent stakeholders. Mixed methods and group modelling with local experts can help to surface missing processes and test alternative assumptions through scenario or sensitivity analysis. Clearly documenting epistemic limits and under-represented groups also increases transparency and supports the cautious interpretation of leverage points. Nonetheless, this is only the conceptual model stage, which aimed to assess the usefulness of NAS rather than to demonstrate the universality of its results. This should later progress through the next stages of model evaluation (Augusiak et al., 2014). If proper empirical validation is desired, system dynamics would be essential, so that the model can eventually be transferred into a computerized simulation.

In addition, the previous assumption that a NAS approach generally requires more structure (Cox, 2014; Kimmich, 2013), such as a MLG framework, can be challenged. The results of this study show that NAS does not necessarily need to be grafted onto MLG. When the two were combined during the modelling phase, most NAS ‘‘broke through’’ the structure because they operate on either two or three different levels. This does not mean that MLG is dispensable during the modelling phase, but rather that NAS can represent conflictual actions across different spheres of activity and levels of governance. A pertinent conclusion reached through MLG is that the issue of UPGS governance in Bucharest gains complexity at the national level and peaks between the metropolitan and district levels, proving that the problem is more internal than influenced by international AS or entities. MLG was absolutely essential in the spatial and expert sampling phases. Without it, the study would have lacked coherence in identifying appropriate sources of information. Therefore, although MLG may be less convincing in the modelling phase, it was crucial in the data collection and research design phases.

Moreover, the inclusion of the community level among the levels of governance was indeed plausible for modelling the district level based on the three communities. It was wise to limit the use of the community level to the data collection stage, as interviewees did not provide much detail about problems between neighbours or very localised issues. The invited citizens were truly representative of their community as a whole in relation to other stakeholder groups. Once the results were presented, the differences between the three spatial samples became less apparent.

With regard to the unit of analysis of NAS, namely AS, most scholars construct their own interpretation of what an AS should include, but remain consistent with the idea of identifying social spaces where actions recur and where actors interact and produce outcomes. While the expert sample is intended to be representative of each level of governance, it cannot fully capture the diversity and complexity within each level. It is important to note that all information collected reflects the participants’ prioritisation. Therefore, the AS identified are those prioritised by the experts, which means that other AS may still exist in the UPGS governance system but were not revealed in this study.

6. Conclusions

From a design perspective, landscape architects, alongside urban planners, civil engineers, and related professionals, have identified key drivers of green space conflicts, such as the inadequate selection of plants or materials, which ultimately leads to inefficient management and overall low aesthetic value (Culescu et al., 2021); the incoherent distribution of green spaces, which contributes to urban gentrification (Gupta et al., 2025; Wang et al., 2025); and the lack of ecosystem services, which turns these spaces into mere green deserts for both people and local biodiversity (Ignatieva & Ahrné, 2013). These studies, informed by landscape criticism, are highly context-specific (Bowring, 2020). Despite this, most of their findings consistently highlight the need for a proactive attitude from public authorities in reaching various conflict resolutions, and increased collaboration across various sectors, signalling the complex systemic nature of urban issues (Coppens, 2014).

The Bucharest case demonstrates that combining NAS with MLG can reveal leverage points with high connectivity and feasibility, even in complex systemic conflicts over urban green spaces. The three leverage points identified, (i) public-private partnerships, (ii) a city-wide UPGS inventory linked to an updated General Urban Plan (PUG), and (iii) harmonisation of legal provisions with robust databases, are based on three generic governance dimensions that are common to metropolises worldwide, namely institutional

coordination, information provision and legal clarity. Furthermore, the Bucharest case reveals that no single AS dominates, as the problem is distributed across a tightly interconnected network. Such systemic interdependencies are also common in the governance of green spaces in large cities worldwide. Numerous cities face issues such as ambiguous property status, legislative gaps, and the need for capacity building in public-private partnerships. As it addresses a fundamentally systemic issue using a transferable modelling routine, the case study provides generalisable lessons for other metropolitan contexts. The qualitative coding procedure, the derivation of Meta-linkages from expert interviews and the two-stage modelling process (current and improved NAS) constitute a replicable workflow for researchers tackling UPGS or other socio-ecological systems. As NAS is not strictly standardised, the study demonstrates how heuristic choices, such as expert coding, Meta-linkage construction and the incorporation of literature-based suggestions, can be systematically employed while still respecting the underlying theory and the specific local context.

For practitioners, the first step is to map local Action Situations and their Meta-linkages. The second step is to assess each node based on connectivity and feasibility. These two scores can be combined to create a ranking metric, as it was done for Bucharest. Prioritising nodes that score highly on both dimensions creates a clear, evidence-based pathway for breaking conflict stalemates. The Bucharest analysis therefore provides urban planners in metropolitan areas around the world with a scalable, evidence-based framework for diagnosing systemic governance failures and identifying the most effective intervention points.

This study clearly demonstrates that a NAS approach can provide positive insights amidst seemingly intractable conflicts. Rather than becoming frustrated with perceived systemic inefficiencies in UPGS management, it urges urban professionals to take a more analytical approach. Progress in this area requires urban professionals from the private sector to develop a nuanced understanding of the challenges faced by their public sector counterparts. At the same time, public authorities must recognise that, although no single entity can address all issues in isolation, the very interconnected nature of the UPGS governance system offers opportunities for greater collaboration and efficiency.

CRediT authorship contribution statement

Raluca-Ioana Mihai: Writing – original draft, Visualization, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Heiner Schanz:** Writing – review & editing, Validation, Supervision, Conceptualization.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used DeepL Pro in order to check for grammar and expression errors. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jum.2026.03.001.

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