

ENVIRONMENTAL CONFLICTS IN THE CONTEXT OF THE CHALLENGING URBAN NATURE

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Abstract: Faced with multiple internal and external challenges, urban environments are increasingly searching for instruments adequate for achieving their sustainability goals. Different forms of urban nature can represent such instruments of addressing new societal ambitions, but in the same time can determine the emergence of urban environmental conflicts. We present an overview of how urban nature can become trigger and influencing factors for environmental conflicts under different policy contexts and how we can research and resolve conflicts of key urban actors by increasing public participation in the decision-making process. Environmental conflicts involving urban nature are presented across different elements, such as urban green and blue areas, urban biodiversity, protected areas or urban agriculture. We advocate for nature-based solutions as an integrated manner of including nature in urban areas without environmental conflicts emerging.

Key words: urban nature, societal challenges, triggering factors, conflict evaluation, conflict resolution, nature-based solutions.

1. THE CHALLENGING URBAN NATURE AND THE NATURE OF URBAN CHALLENGES

Cities become the most important and attractive environment for humans (Artmann, et al., 2019a) as multiple benefits polarize people in cities (e.g. employment opportunities, physical safety, access to high diversity of human infrastructure), often neglecting associated environmental issues related with land use and land cover, biogeochemical cycles, climate, water (Csete & Gulyas, 2019) and biodiversity management (Ameen & Mourshed, 2017; Grimm, et al., 2008). Therefore, cities are centers where all the positive and negative aspects of human existence come together (Beumer, 2018), including the frequently complicated relation between society and nature.

To keep cities smart, safety, and healthy in the context of continuously increasing population and urban expansion (Malakoff, 2016), there is a continuous search for achieving sustainability and resilience (Bush & Doyon, 2019; Ramaswami, et al., 2016). Urban environments have become a hotspot of dealing with societal challenges in innovative ways (Raymond, et al., 2017). The new societal ambitions

are expressing not only at social, economic, environmental and governance level (EC, 2010), but also in more concrete ways across the planning, design and management of different forms and expressions of urban nature (Frantzeskaki, 2019).

The human-nature connections need smart approaches at global (UN, 2012), regional (e.g. compact green cities (Artmann, et al., 2019b), resilient cities and local level (e.g. nature-based solutions (Albert, et al., 2017), urban green infrastructure (Badiu, et al., 2019). Measures across levels can balance each other with mutual benefits (McDonald, et al., 2009). Often this relation is unfunctional and cities should better make use of their natural environment potential and the expected benefits (Zwierzchowska, et al., 2019), especially as it is obvious that nature and cities are not antagonistic concepts when it comes to sustainability (Nita, et al., 2018a), but rather a good integration and use of nature can help cities reach a range of social and economic targets, beyond the expected environmental benefits. Most cities will require transformational changes to cope with their urban challenges, although there is no clear consensus on what qualifies as the transformational change needed to confront sustainability challenges (Iwaniec

et al., 2019), and there is not a single and clear path to it given the conditions and governance structures specific at country, regional or local level.

Forms of urban nature are varying across cities, like conserved remnants, restored natural ecosystems, abandoned wastelands and designed landscapes (McKinney, et al., 2018). They can include besides remnants of natural ecosystems and traditional elements, like forests, wetlands, grasslands, parks, gardens, (Egerer, et al., 2019), recent innovative forms of integration (such as green roofs or walls, vertical gardens). All of them are important in a certain direction, as they can link social and ecological dimensions of wilderness, and integrated them into planning approaches (Kowarik, 2018).

There is still a continuous debate on where the line is between what is considered nature and natural in an urban environment (Dorst, et al., 2019), and the debate is fueled by both the existing hybrid forms of nature characterizing cities, but also by the reality that nature in cities is frequently an extensive managed nature.

The aim of this extensive management of nature regards mainly removing some of the unwanted disservices nature can bring (allergens, unwanted species, etc.) (Schaubroeck, 2017), but also creating more synergies, referring to positive interactions emerging when more ecosystem services are enhanced simultaneously (Hossu, et al., 2019), mainly due to the limited resources of space city have. More nature experiences in urban settings tend to be a integrative part of urban life.

In modern cities there is now a shift from the traditional approaches focusing on restrictive protection of nature, into a balanced one between utilization and conservation, the flagship of this new approach being the ecosystem services system (Chen, et al., 2017). In the same time, addressing the urban nature in a holistically approach puts nature and people closer, increasing the potential for interactions, either positive or negative (McDonald, et al., 2009) but also shifting patterns of behavior and action for urban actors (Robinson & Breed, 2019).

New societal ambitions recognize the importance of having access to nearby urban green spaces (Kolcsar & Szilassi, 2018) as a necessary component for delivering sustainable living conditions (McEwan, et al., 2019), but is still challenging finding the perfect methods for urban nature to be better embedded in the city (Erixon Aalto & Ernstson, 2017) while also demonstrating to actors the explicit correlation between nature and positive outcomes for society (Dorst, et al., 2019). This demonstration is not an easy task and frequently its absence fuels disagreements between urban actors.

Approaches of new interdisciplinary knowledge and applications in cities have evolved in time and adopted a series of metaphors for integrating nature in cities, such as ecosystem services, green infrastructure (Escobedo, et al., 2019) or nature-based solutions as actions designed to address environmental, social and economic challenges simultaneously and deliver ecosystem services (Andreeva, 2019).

In addition, concepts have been developed associated with the transformative pathways of cities and their approach to reaching sustainability and resilience, such as *compact cities* that limit urban sprawl and unwanted spatial development (Artmann, et al., 2019a), *smart cities* promoting the use of information and communication technologies (Nilssen, 2019) or *green cities* that emphasize on the natural environment and the rational use of its resource (Przywojska, et al., 2019).

The *paper aims to present an overview of environmental urban conflicts involving urban nature*, between a variety of *forms of nature* (blue and green areas, biodiversity, protected areas, urban agriculture) and across different *expressions of conflicts* (by triggering or influencing factor, forms of manifestation or evaluation, key actors involved), therefore advocating for the use of *nature-based solutions* as a concept of *sustainable urban – nature integration*.

2. ENVIRONMENTAL URBAN CONFLICTS

Environmental conflicts emerge when at least one actor expresses concern about a plan, project or activity of another actor which is in dissonance with environmental principles (Iojă, et al., 2016). Given the diversity of conditions and actors in cities, environmental urban conflicts are often opportunities as well as problems, increasing the importance of considering place-based conditions in their evaluation and resolution. Frequently causes of conflicts can be tracked into the principles and measures adopted for urban management (Ianoş, et al., 2017).

Conflicts are inevitable in urban environments due to the long-term agreement and multiplicity of stakeholders with varying beliefs and interests (Osei-Kyei, et al., 2019) and frequently the source of urban environmental conflicts is distributive, since they involve inequalities and asymmetries (Rincón-Ruiz, et al., 2019). Furthermore, in cities, actors (individuals, groups or organizations from public or private sectors) are dependent upon one another, since resources are not concentrated in the hands of one actor, but spread between them (Li, et al., 2016).

Various urban stakeholders provide their own value judgments about the alternatives of urban

planning, design and management (Shapira, et al., 2019), and sometimes perceptions are unclear or disagreement is based on long-forgotten events or unfounded prejudice (Barrow, 2010). In order to avoid the emergence of conflicts, decision structuring tools and support systems offer the possibility to make participatory decision processes more transparent (Wittmer, et al., 2006), especially as conflicts can be expressed differently across the ecologic, socio-economic, temporal or spatial dimensions (Fig. 1).

Triggers and influence factors for environmental conflicts are expressed by: *believes* (perceptions of what is right and wrong), *interests* (competition for resources or power), *data* (deficient information for understanding the conflicts), *relations* (incomplete communications, disagreement) and *procedures* (ambiguous regulations, reduced transparency or participation in the decision making process) (Ioja, et al., 2015).

There is high agreement that low socio-economic development is one of the strongest predictors of the onset of intrastate conflict and its continuing incidence (Mach, et al., 2019) especially in systems characterized by low levels of governance (Przywojska, et al., 2019). The actors search for equal access to high quality urban nature or the reality that urban green spaces connect people with place and service to others (Jennings, 2019) are some of the

forms in which nature can be involved in urban environmental conflicts. A key component for the emergence of urban environmental conflicts is related to societal trust, which reflects the subjective belief and confidence actors have in their counterparts in fulfilling their claims of the agreement (Brockman, et al., 2018) but also to the communication carried out in conditions of ongoing environmental conflict (Asteria, et al., 2014).

The *policy context of urban environmental conflicts* can be derived from their pursuit of Sustainability Development Goals and other international environmental agreements. However strange it might sound that SDGs (and especial goal 11 of making cities inclusive, safe resilient and sustainable) have a role in environmental conflicts, this happens mainly because public understanding of the SDGs and sustainability can influence their engagement, as people are more likely to accept and share information consistent with their own understanding (Bain, et al., 2019).

Urban policies should be negotiated through complex interactions between a multitude of agents at different levels (Varela et al., 2018), but when instead we are confronted with top-to-bottom approaches, centralized decision or too much emphasis on locally relevant aspects we have the conditions of environmental conflicts emerging.

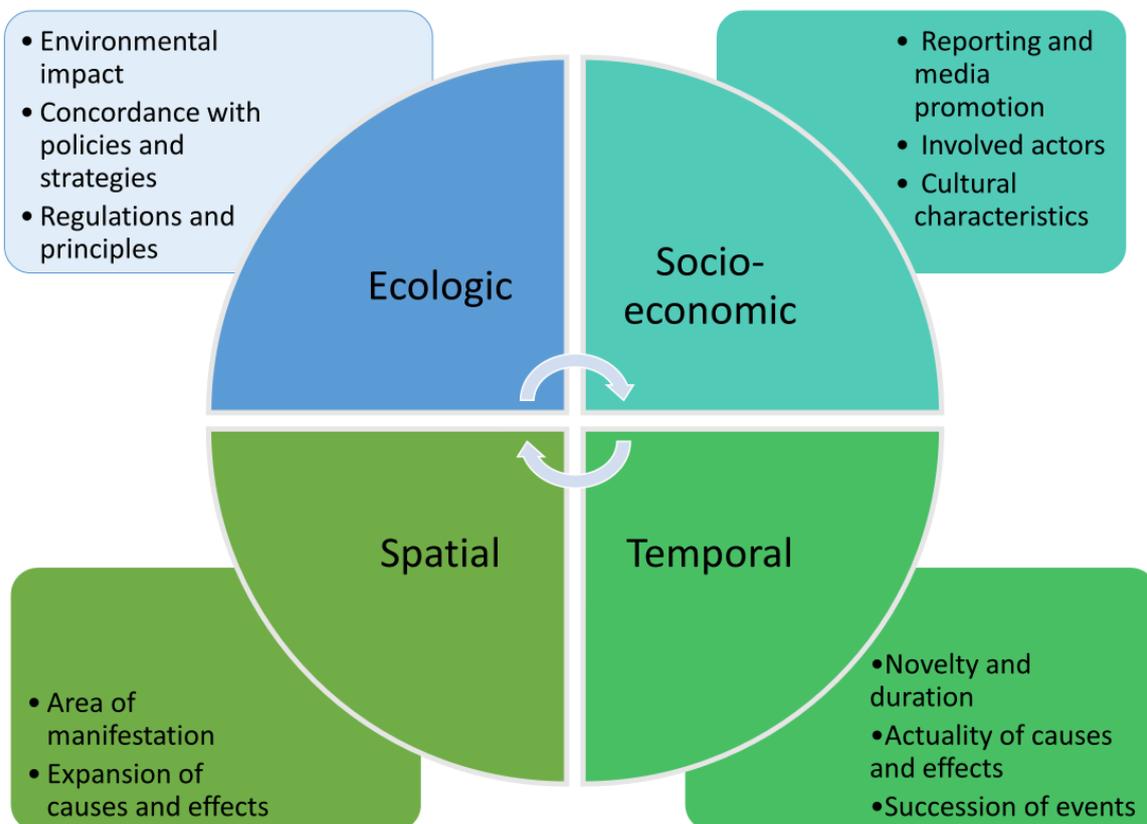


Figure 1. Examples of manifestation of conflicts across four dimensions (Ioja, et al., 2015)

Environmental threats associated with urban nature (such as forms of environmental pollution, invasive species, risks) can pose a range of effects leading to the triggering of environmental conflicts: *direct effects* (determined by the physical destruction of urban nature and the release of polluting substances in the environment), *indirect effects* (resulting from the strategies of actors to mitigate effects of socio-economic changes and losses of basic ecosystem services) or *institutional effects* (influencing the normal functioning of public institutions, mechanism and programs of coordinating public policies).

Such environmental threats associated (rightfully or mistakenly) with nature can change the level of resistance and acceptance from residents (Ali, 2014) and awake strong feelings or behaviors. Sometimes, fair economic compensation could be offered in exchange for them (Pang, et al., 2018), but the question is who is responsible for paying for nature and where to find such funds?

The *methods of evaluating conflicts for urban nature* are developed on two main directions: *evaluating effects of urban nature* (e.g. correlational studies of benefits, employing spatial analysis using GIS techniques (Yoon, et al., 2019), modern techniques for experience sampling utilizing technology such as Smartphone applications, online participatory GIS and social media (McEwan, et al., 2019), connectivity and multifunctionally analysis (Niță, et al., 2018a), ecological modelling and direct benefits quantification (Heusinger & Weber, 2017)) and *evaluating the conflict potential* (e.g. expert elicitation as a method for documenting expert judgements (Mach, et al., 2019), NAIADE multicriteria evaluation model including matrices of impact and equity or Analytical Hierarchy Process as a common Multi-Criteria Decision Making instruments to deal with quantifiable and intangible criteria, which reflect the relative importance of the alternatives based on constructing a pair-wise comparison matrix (Dao, et al., 2019)).

Public participation in the decision-making process about urban nature is therefore a great way of preventing environmental urban conflicts. Approaches for this can be related to solving complex multi-person and multi-criteria decision problems by weighting environmental conflicts and relating them to alternative sites (Dao, et al., 2019), responding to the resistance of neoliberal urbanization and the demand of residents to reclaim public space and self-governance (Artmann & Sartison, 2018) or by engaging marginalized and vulnerable stakeholders to enhance equity, well-being, and livelihood (Iwaniec, et al., 2019). Knowledge sharing mechanisms and technologies are also identified as important instruments for inclusion of urban nature views and perceptions in the decision-making process

(Sarabi, et al., 2019).

Key urban actors for environmental conflicts can be classified according to their: *position* in the conflict (pro or against nature), *role* in the management of environmental conflicts (regulating, decision, management, public), *legislative* regime of goods and services. Other classifications divide the actors involved by level (Sarabi, et al., 2019): micro-level (citizens, landowners, business owners, citizen groups, and NGOs), meso-level (departments of public administration), and macro-level actors (regional and national authorities).

However we classify them, there is now a consensus on the fact that a wider range of stakeholders are involved in urban nature management than ever before, therefore the increasing need to incorporate citizen views into planning and therefore legitimize what has been planned (Barrow, 2010) or to build mutual trust among stakeholders in initial planning or management stages (Varela, et al., 2018).

3. ENVIRONMENTAL CONFLICTS INVOLVING URBAN NATURE

Among the forms of urban nature, elements such as urban green and blue areas, urban biodiversity, protected areas or urban agriculture are the ones most frequently associated with the emergence of environmental conflicts.

These conflicts can be determined by the competition between nature and other urban functions or land uses (Fu, 2018), between users who access different services of nature (Ioja, et al., 2011), development or re-development of natural elements (Nita, et al., 2018b), the management of nature (He, et al., 2016), disconnection and reduced exposure to natural elements (Robinson & Breed, 2019), direct conflicts with biodiversity (Campbell-Arvai, 2018) or various other forms of interactions between institutional or stakeholders interests in public decision or in general aspects of urban environments.

Urban green and blue areas are one of the best-known elements of urban nature, but there is still a high level of heterogeneity in their distribution across cities, fueling conflicts of access and distributional equity (Kronenberg, et al., 2020). Urban blue and green areas are lost at an increasing rate in the or are under high pressure from the effects of urbanization (Hossu, et al., 2019), requiring the development of alternative frameworks for management as a response (Leigh & Lee, 2019).

Also, there is a fine balance yet to be found, between the urban green and blue areas experience being as close to real nature as possible for visitors and negative effects and consequences of nature. Different

users of urban green and blue areas can associate a broad range of social values with nature spaces (Egerer, et al., 2019), according to their ethnic or religious background, or conflicts can emerge from competing desired activities e.g. quietness vs. noise, walking vs. cycling, relaxation vs. sports.

Urban biodiversity is a hot topic found across environmental urban conflicts, and biodiversity conflict is defined as occurring when the interests of two or more parties in some aspect of biodiversity compete, and when at least one of the parties is perceived to assert its interests at the expense of another (Lecuyer et al., 2018).

Not all biodiversity is seen the same way by urban actors, per example areas with a diversity of birds are likely to be perceived as unique and valuable urban nature, while insects or fungi have a detrimental and unwanted presence (Wang, et al., 2019). It does not help that top-down evaluations of biodiversity have limitations in terms of data collection and continuous monitoring (Kohsaka & Uchiyama, 2017), and negative interactions between urban actors and elements of biodiversity need further research.

In *urban protected areas*, the main conflicts are recorded between human activities and biodiversity management, but urban functions which can conflict with protected areas are diverse, dependent especially on the activities allowed or restricted in the protected

area (Ioja, et al., 2016). The ecologically vulnerable lands characterizing protected areas are used by human activities, thus causing conflicts between two different stakeholders: those favoring conservation and those favoring use of land (Kim & Arnhold, 2018), while land use change in the proximity also have implications for the protected area (De Leon & Kim, 2017).

The environmental conflict can be bidirectional, on one hand due to the main negative effects cities have on the protected area regime (air pollution, noise, smuggling and poaching, nighttime light, wastes or direct wildlife conflicts, exotic species establishment) (McDonald, et al., 2009), and on the other hand due to the negative effects the protected area generates (direct contact with species, changes in permitted activities or even access, special rules or taxation).

For *urban agriculture* the conflicts are depended on the form of representation: for traditional urban agriculture it is more about competing land uses and the sustainability of urban agriculture in urbanization (Armanda, et al., 2019) while modern forms of urban agriculture with innovations aimed at developing edible cities (Mårtensson, et al., 2016). Environmental conflicts derive also from the abandoned lands due to difficulties in maintaining agriculture (Gradinaru, et al., 2020).

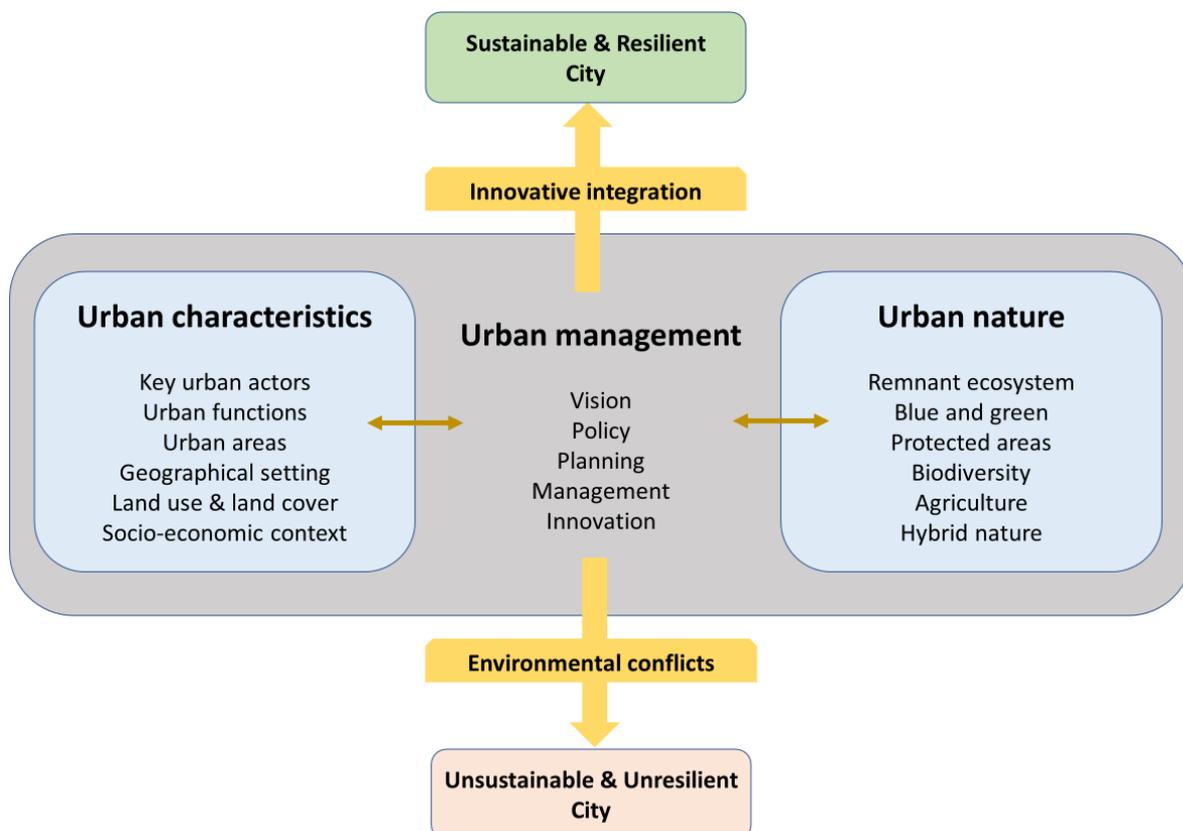


Figure 2. A correct integration of urban nature in urban characteristics can lead to sustainable and resilient cities and avoid the emergence of environmental conflicts

Policy and decision makers have been continuously looking for better ways of *integrating nature into the socio-economic systems*. One concept developed especially at European Union level is that of *nature-based solutions* (Faivre, et al., 2017), which is nothing more than an integrated and systemic way of using nature for addressing the societal challenges generated by urban characteristics. The use of such an innovative integration can lead to reaching the targets of sustainable and resilient cities (Fig. 2).

Nature-based solutions contain all the elements of addressing environmental conflicts:

- a strong emphasis put on the promotion of natural processes and ecosystem-based approaches (Bridgewater, 2018; Krauze & Wagner, 2019);
- careful consideration of relevant societal challenges and ways of addressing them (Frantzeskaki, 2019; Laforteza & Sanesi, 2018);
- increased public participation through co-creation, co-design and co-management (Cohen-Shacham, et al, 2019; van der Jagt, et al., 2019);
- emphasis of multiple benefits and co-benefits associated with nature (Calliari, et al., 2019; Raymond, et al., 2017).

These four components of nature-based solutions represent strong arguments in promoting the concept as an innovative way of preventing the emergence of urban environmental conflicts associated with urban nature.

4. CONCLUSION

Environmental conflicts are emerging at higher pace in urban areas, due to the high number of stakeholders with various interests, a wide range of urban functions and land uses or various policies and planning approaches.

Different forms of urban natures are frequently in the focus of environmental conflicts, either due to their services and disservices provided to human society, or through competition with other urban functions. An innovative way of integrating nature into the planning and management of urban environments should be put in place in order to avoid such conflicts emerging, and the nature-based solutions concepts offer all the right arguments in this direction.

Future research perspectives should emphasize the participatory aspects of environmental urban conflicts in more detail: whom to involve, where and why, and how to link deliberation with structuring or analytical tools (with a special focus on decision failure). Also, careful consideration should be given to the indirect and synergic effects of nature and disconnection seen in some local contexts between nature and socio-economic systems.

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