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The everyday politics of urban transformational adaptation: Struggles for authority and the Barcelona superblock project

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ABSTRACT

As the vulnerability of cities to the effects of climate change increases, so does the urgency of and interest in urban transformational adaptation. To date, however, research has not looked empirically at how "everyday" urban politics shape the multi-scalar political constraints that prevent municipalities from implementing transformational adaptation. We analyze the Poblenou superblock project in Barcelona, Spain as an effort to enact transformational land use planning linked with climate adaptation efforts. We find that the key driver behind opposition is the everyday political struggle for municipal authority, which materializes in clashing visions for the future city – and who has the political clout to define and own them. We show that urban transformation is at least as much about competitive urbanism and related short-term political gains as it is about the importance of environmental and quality-of-life benefits that are ostensibly the target of interventions. We also highlight how civic and political contestation over the authority of 'climate champions' can jeopardize not only transformational adaptation achievements, but also the political survival of champions themselves. We conclude that transformational adaptation can be obstructed not only out of fear for the material and political effects of transformation per se, but also because of the message it conveys as concerns of who has the authority to decide for "the common good".

1. Introduction

Though cities are increasing the resources dedicated to addressing the risks and impacts of climate change, a worrying disconnection exists between the prescriptions of climate science and the reality of deeply-rooted, unsustainable urban development patterns. Climate scientists and policy analysts assert that, because cities are high producers of greenhouse gas emissions and urban residents are under high risk of negative climate impacts (IPCC, 2014; Revi et al., 2014), there are strong untapped opportunities for municipal climate adaptation strategies to be bold and make rapid progress (Araos et al., 2016).[1] Indeed, ongoing initiatives for urban climate adaptation motivated by increasing experiences with natural hazards as well as cities' desire to show leadership in climate action and connect with international organizations and networks implies that the conditions for such progress are present (Carmin, Dodman, & Chu, 2013).

Yet, while the disconnect between climate science and development patterns could in theory generate a leap forward in the evolution of norms around urban land use policy (True, Jones, & Baumgartner, 1999), there are few concrete examples of transformational adaptation at the city scale that demonstrate a true non system-affirming intervention (Lang & Rothenberg, 2017; Lubell, Feiock, La Cruz, & Ramirez, 2009). In contrast to incremental approaches, such transformational interventions in urban adaptation would respond to climate change by pursuing fundamental and structural shifts in urbanization processes and outcomes, which are meant to challenge unsustainable development pathways in a radical way. Although advocacy for these types of transformational approaches is gaining relevance, finding cases of transformational adaptation is hard in general (O'Brien, Eriksen, Inderberg, & Sygna, 2015), and in particular, it

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[1] Araos et al. (2016) illustrate that only 15% of the 401 municipalities with more than 1 million inhabitants report adaptation initiatives.

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is difficult to find cases of initiatives related to climate change where the promoters of those initiatives explicitly frame them as 'transformational adaptation.'

Keeping in mind that there is no prototypical case and that there are multiple interpretations (IPCC, 2014; Lonsdale et al., 2015; Mustelin & Handmer, 2013), certain core characteristics that must be present for an intervention to be considered a transformational urban adaptation are emerging within the literature. First, transformational actions involve non-linear alterations at an enlarged scale or intensity that reorder and/or relocate systems, transform places, and shift locations (Kates, Travis, & Wilbanks, 2012). Second, they address "underlying failures of development, including increasing greenhouse gas emissions by linking adaptation [and] mitigation" (IPCC, 2014 quoted in Pelling, O'Brien, & Matyas, 2014: 2). Third, they seek fundamental alterations *within* a system (like a city) that itself produces climate change vulnerability both elsewhere and within its contours (Du et al., 2019, p.6). In doing so, they seek to affect both local adaptive capacity and global mitigation. Fourth, they confront generative causes of vulnerability to climate change by engaging with the politics of managing risk (Connolly, 2018; Ribot, 2011).

Yet, identifying these four characteristics of transformational urban adaptation does not allow an essential underlying question to be answered in full (see also Du et al., 2019): What determines the difference between incremental and transformational urban climate interventions? In order to address this question, it is necessary to highlight a fifth characteristic of transformational urban climate adaptation: it reshapes existing local politics in order to overcome barriers embedded within entrenched institutional norms protected by uneven power structures, often supporting growth (Araos et al., 2016; Bassett & Fogelman, 2013; Di Giulio, Bedran-Martins, da Penha Vasconcellos, Ribeiro, & Lemos, 2018; Torabi, Dedekorkut-Howes, & Howes, 2018). These everyday politics often stubbornly weigh down efforts to make a leap away from the status quo (Bahadur & Tanner, 2014), but are also the arena wherein norms can be changed and pathways can be (and must be) carved out for enacting far-reaching new ideas.

Considering these five characteristics, understanding transformational urban adaptation requires a frame that explicitly includes outcome and process. Given this view, the unit of analysis is not just the intervention itself, but also the period of making transformation happen that surrounds the intervention, including formulation and implementation phases. Such a focus adds a prescription for how power is organized and how struggles for authority are resolved within transformational urban adaptation.

1.1. Adding in the period of making transformation happen

One barrier to transformation embedded in everyday politics is existing power relations and struggles for authority. While this barrier is identified in the literature, it is so far underexamined because of the rare, on-the-ground instances of transformational urban practice. Indeed, many adaptation programs are not politically neutral (Chu, 2017; Shi et al., 2016), require strategic approaches (Chu, Anguelovski, & Roberts, 2017), and are designed to work within neoliberal development pathways and practices (Chu, 2017; Revi et al., 2014; Whitehead, 2013). As a result, they potentially reproduce uneven socio-economic vulnerability (Anguelovski et al., 2016; Chu, 2015; Eriksen & Brown, 2011). Efforts to bring about urban transformational adaptation must necessarily confront those dynamics by taking into account the power relations that underlie urban development pathways and which (re)produce uneven vulnerability to climate change and environmental injustice (Bahadur & Tanner, 2014; O'Brien, 2012; Pelling, 2010; Ribot, 2011; Taylor, 2014; Zografos, Anguelovski, & Grigorova, 2016).

Regularly, the everyday politics of cities that hinder transformational urban adaptation are embedded in larger-scale dynamics that ensure the path to transformation is not smooth. The climate change adaptation literature[2] identifies several barriers that lean outcomes toward the status quo rather than transformation: cognitive limitations (Lonsdale et al., 2015; Park et al., 2012; Pelling, O'Brien, & Matyas, 2015); uncertainties about the level of benefits from transformation (Kates et al., 2012) as well as transaction and opportunity costs, and the costs of risks and unexpected side-effects of transformations (Kates et al., 2012; Rickards & Howden, 2012); path dependency (Hadarits et al., 2017; Termeer, Dewulf, & Biesbroek, 2017); the difficulty to transform institutions designed to pursue ends contradicting transformational priorities (Godfrey-Wood & Otto Naess, 2016) and reward incremental action (Kates et al., 2012; Pelling et al., 2015); short-termism in responding to climate pressures (Ribot, 2011); organizational limitations (Termeer et al., 2017); collective action barriers (Lonsdale et al., 2015); the complexity of transforming multiple spheres of human experience and interacting socio-ecological spheres (Gillard, Gouldson, Paavola, & Van Alstine, 2016; Lonsdale et al., 2015; O'Brien, 2012; Pelling et al., 2015); a lack of attention to institutionalized inequities responsible for vulnerabilities and urban environmental inequities in the first place and to elite and private interest capture of the adaptation and development agenda (Anguelovski et al., 2016; Shokry, Connolly, & Anguelovski, 2020); and, the relevance of established values and personal beliefs that can mobilise resistance to transformation (Kates et al., 2012; O'Brien, 2012; O'Brien & Sygna, 2013; Park et al., 2012; Pelling et al., 2015), such as place attachment and occupation attachment that can be negatively correlated to transformational capacity (Hadarits et al., 2017; Marshall, Park, Adger, Brown, & Howden, 2012; Park et al., 2012).

There is a broad consensus among critical work on transformational adaptation that power, politics and interests can pose daunting barriers to transformation (Pelling & Manuel-Navarette, 2011), that deliberate transformations require "changes to entrenched systems maintained and protected by powerful interests" (O'Brien, 2012), and that regardless of the approach taken toward transformation, unequal power relations can prevent transformative change (Godfrey-Wood & Otto Naess, 2016). Power distributions in existing institutions combined with "lock-in to unsustainable development pathways" (Pelling et al., 2015) point to the need for confronting systemic barriers in the course of realising transformation (Glavovic, 2008). For example, system stagnations, such as vicious circles, exasperating delays, or an escalated conflict, are a case of barriers for changing environmental dynamics that can be rooted in vested interests (Termeer et al., 2017). Power and politics are also expressed through the construction of subjectivity, knowledges, and the operation of authority (Nightingale, 2018), phenomena that are reproduced and contested with adaptation practices "in ways that can open up or close down space for transformational adaptation" (Eriksen, Nightingale, & Eakin, 2015). This emphasis on the political sphere also draws attention to the crisis of capitalism (O'Brien & Sygna, 2013). This includes the capacity of neoliberalism to create "systemic constraints that incapacitate Western democracies from going beyond incremental adaptation efforts" (Fieldman, 2011 quoted in Termeer et al., 2017). Related work also analyses the capacity of the political economy of capitalism to appropriate transformation as an opportunity for capital accumulation (Godfrey-Wood & Otto Naess, 2016; Warner & Kuzdas, 2017; Whitehead, 2013), and the foregoing of transformative adaptation interventions in vulnerable places in favour of incremental ones in ways that allow maintaining rent-seeking projects elsewhere (Zografos, 2017).

[2] With the exception of few empirical studies that typically focus on agriculture in the Global North (Hadarits et al., 2017; Marshall et al., 2012; Park et al., 2012) – two exceptions are Termeer et al. (2017) who analyze a more comprehensive flood protection policy initiative in the Netherlands, and Ziervogel et al. (2016) who explore transformative capacity in urban settlements in South Africa), this transformational adaptation literature is mostly conceptual.

As others have mentioned (Bicknell & Dodman, 2009), in addition to the outcome-oriented characteristics of interventions that seek large-scale, systemic, non-linear changes that cross the threshold of transformational adaptation, scholarly attention also needs to focus on the ways these interventions interact with political constraints and institutionalized power relations embedded in the everyday politics of urbanization. From this perspective, the urbanization to be transformed is "an expression of intersecting regimes of social power" (Whitehead, 2013: 1348) that need to be reconfigured in order to integrate inclusiveness, equity, and resilience into urban climate infrastructure and design processes (Bahadur & Tanner, 2014; Chu, 2017; EEA Report, 2016; Revi et al., 2014). Adaptation, then, is inextricably entangled with the question of who has authority – understood as the legitimate ability to exercise and control power – over land use and beyond. Struggles for authority may open up or close down spaces for transformational adaptation through, for example, competition over the ability to set agendas in the process of urban environmental governance (Eriksen et al., 2015; Fairhead, Leach, & Scoones, 2012; Nightingale & Ojha, 2013; Sikor & Lund, 2009). Given contested claims to authority, whether urban climate adaptation becomes transformational or not is partly dependent on the extent to which some visions of the future city become legitimized within city planning and development processes (Eriksen et al., 2015). In that sense, issues related to environmental policy and planning per se might become secondary in the fight for transformational planning.

1.2. Toward a process-outcome understanding of transformational urban adaption

Although the current scholarship has produced elaborate and highly valuable conceptual explanations of how power relations and struggles may affect transformational adaptation, empirical research on barriers to adaptation initiatives with goals and outcomes that are specified to be of a transformational nature in urban areas can hardly be found. In their review of the literature on transformational adaptation, Lonsdale et al., 2015 also note "a dearth of examples of transformational adaptation that enquire with sufficient depth and honesty into the real, messy practice involved in trying to transform an existing system" (p.30), and that traditional case study approaches are reluctant "to record aspects that might be considered 'mistakes' or 'failure', although these parts are where the potential for greatest learning lies" (p.28). In our views, understanding how resistance processes interact with and change the nature of planned interventions is key to moving transformational adaptation knowledge forward.

We address the gap in knowledge identified by Lonsdale et al., (2015) by examining what happens when urban authorities try to implement transformational land use policy but face familiar resistance from several directions, as in the case we present in this paper. We ask: What sort of barriers emerge, and how, when those in authority try to pursue transformational action at the city level and face resistance? And what do these political dynamics tell us about the required process-oriented characteristics of transformational adaptation at the urban level? Our paper responds to these core questions through the analysis of the politics of a conflict around a flagship urban intervention with stated transformational goals that became linked to the local climate action agenda – the superblock project in Barcelona, Spain.

1.3. Selecting an emblematic urban case with transformational qualities

Our study examines the implementation of the Barcelona superblock program's pilot project in the district of Poblenou (also called SP9) – henceforth, the superblock.[3] Barcelona's experience represents a single, in-depth, critical and emblematic case of attempted transformational land use intervention that has become integrated into adaptation practice. While Barcelona's superblocks is a unique case of an early urban intervention that was framed in the language of transformational adaptation and integrated into the city's climate strategy, it is representative of large-scale initiatives aiming at addressing climate challenges within other European Mediterranean cities, including those seeking to mitigate heat island effect, coastal erosion, and flooding. Barcelona's superblock programme is an ambitious project that aims at transforming multiple dimensions of the urban living experience. Although urban greening, sustainable mobility, increased public space use and citizen participation in planning are key programme objectives, the superblock project has become explicitly integrated into the city's Climate Action Plan and Barcelona's Climate Commitment initiative mostly due to its capacity to address the urban heat island effect and reduce overall transportation emissions. While it is not the only climate intervention in the city, the intended size of the overall project (503 superblocks covering the entire city proper) and its combination of adaptive measures and mitigation efforts makes it indicative of transformational climate efforts from the side of the municipal authority. It is a case of municipal land use policy with transformational intent that has been integrated into climate policy in Barcelona – this status means that it provides important elements and lessons for transformational climate adaptation.

Our analysis is based on fieldwork conducted between March and August 2017, including 13 in-depth, semi-structured interviews (Table 1) with key stakeholders involved in the Barcelona Mobility Plan, in the design and implementation of the superblock, and the mobilization opposing the project. Interviews were complemented with 17 formal direct observation sessions at the superblock building site, which served to contextualize perceptions and understand social dynamics taking place in and around the superblock. We also complemented fieldwork with an analysis of relevant public plans, local policy documents, media reports (up to July 2019) produced since the initial discussion and visioning work for the superblock, and recent reviews of media articles and informal discussions with local stakeholders working on the further implementation of the superblock intervention through the city. Data was analysed using thematic analysis clustering around phases of the conflict; characteristics and actors of the conflict; resistance discourses; drivers and motivations behind resistance; and resistance responses from municipal stakeholders. In the following section, we elaborate more on those transformational and climate change adaptation characteristics of superblocks.

Throughout this paper, we present Barcelona's superblocks as a project with transformational qualities that became linked with climate adaptation efforts and is going through a negotiated process of implementation relative to the everyday politics of land use in the city. We argue that this case allows for a clear view of why urban transformational adaptation can only be fully specified from a perspective that accounts for process and outcome at once. In this case, conflict over urban climate adaptation planning of a transformational nature revolves around debates over competitive urbanism and related short-term political gains and this conflict shapes to a great extent environmental benefits that are ostensibly the target of interventions. This implies that, when applied to broader scales, transformational adaptation is likely to be a struggle involving political ideology, urban development, market forces and globalization, as well as political transitions (such as self-determination in our case) because of the nature and scale of the changes required. We also highlight how civic and political contestation over the authority of 'climate champions' can jeopardize not only the potential of transformational adaptation outcomes, but also the political survival of champions themselves. As a result, what is at stake in those struggles goes much beyond environmental planning and policy challenges and disagreements.

[3] Superilla" in Catalan.

Table 1
Interviewee characteristics.

Interview (IV) No.	Profile	Role in the process/ reason for inclusion
IV1	City councillor of C's political party	Interviewee with active role in the implementation process due to his position in the city council
IV2	Urban anthropologist, member of the Observatory of Anthropology of Urban Conflicts	Has done research on anthropological aspects of the superblock
IV3	Executive of the Technical Office of Assessment and Environmental Management	The office gives support to the municipality of Barcelona on issues of environmental management
IV4	Former city councillor of CiU political party	Played a central role for the approval of the NUMP and the superblock project
IV5	Executive Officer of Barcelona's Urban Development Agency (environmental projects)	The Urban Ecology Agency developed the superblock model and planned its implementation
IV6	City councillor of ERC political party	Interviewee with active role in the implementation process due to his position in the city council
IV7	Representatives of neighbor associations (in favour of the superblock)	The association publicly support the implementation of SP9
IV8	Representatives of neighbor associations PASP9 (against the superblock)	The PASP9 actively influences the implementation process due to the organisation of demonstrations and the referendum
IV9	Local business	Information into the causes of opposition and the implementation of SP9.
IV10	Executive Officer, Department of Urban Model Prospective, Municipality of Barcelona	Public agency for strategic planning, urban planning and infrastructure.
IV11	Executive of the Department of Forecasting, Municipality of Barcelona	This municipality department works on planning, implementation and evaluation of superblocks.
IV12	Local business	Information into the causes of opposition and the implementation of SP9.
IV13	Local business	Information into the causes of opposition and the implementation of SP9.

2. The superblock intervention in Barcelona

The city of Barcelona plans to radically transform its mobility, public space, and environmental impact by constructing over 500 superblocks that cover all areas within its boundaries. Physically, a superblock is a traffic-regulated cell of city blocks approximately 400mx400m, which consists of nine smaller blocks in a three-block by three-block mesh.[4] In the outer streets, buses and car traffic circulate, while the newly created space in the interior is reserved mainly for pedestrians and cyclists. Thus, the model allows traffic for residents, services, or emergency vehicles, and for future public space interventions.

The plan of creating superblocks in Barcelona first emerged in the 1970s. Early implementations involved traffic pacification plans, which were narrowly designed urban interventions that were not actually called superblocks. The first block free of motorized traffic was set in place in 1993 in Barcelona's old town.[5] Other implementations followed in the 1990s and 2000s, the most well-known in the Gràcia district in 2005. Importantly, the Gràcia traffic pacification program was not embedded in a larger city-wide mobility plan as was the case with Poblenou, making Gràcia's implementation less articulated into a new vision for the city's development and Poble Nou more of a transformational land use and adaptation pilot intervention.

While the boldness of the project has attracted enthusiastic media attention locally (Ara.cat, 2018), in Europe (The Guardian, 2016), and North America (NY Times, 2016),[6] the pilot superblock project in the district of Poblenou (Fig. 1) faced resistance from certain political and civil society spheres. Its implementation at the beginning of September 2016 was characterized by vocal criticism of technical and organizational implementation shortcomings and of lack of citizen participation during the planning and design process. A non-legally binding and low turnout (around 25% participation rate) neighborhood referendum in May 2017 resulted in the majority of participants voting against continuing the pilot project. This result shaped local media coverage and political debate for several months. Figure 2 outlines the timeline of events associated with the Poblenou superblock and, in what follows, we explain both the climate change adaptation elements of the project, and its transformative intent.

2.1. Adaptation to climate change in Barcelona

According to recent studies conducted by the government of the Metropolitan Area of Barcelona, the Barcelona Regional Government and the Catalan Meteorological Service, the city of Barcelona is particularly vulnerable to climate change related threats, specifically sea level rise and floods, increasing temperature including urban heat waves, the loss of biodiversity, and more frequent and intense drought periods.[7]

To counteract climate threats, the municipal government follows a cross-scale interconnected action strategy for the Barcelona Metropolitan Area under the umbrella of the Climate Plan (2018–2030). A key early aspect of the city's mitigation and adaptation efforts has been Barcelona's large-scale 2013–2018 Urban Mobility Plan (PMU, 2014), in which the superblock programme is institutionally anchored in different municipal sectorial plans and commitments (Barcelona City Council, 2012, 2013, 2014, 2015), and is strategically embedded in a larger vision for the city. In its ambition to drastically reorganize urban mobility infrastructure and land use, the superblock intervention aims at reshaping the city into 503 superblocks and hence reduce car traffic by 21% while restructuring the public transit and cycling system and infrastructure. Environmental goals include diminishing alarmingly high noise levels (in Barcelona, these levels are similar to megacities such as Beijing or Mexico City (World Economic Forum, 2017); reducing the 3500 premature deaths per year[8] associated with air pollution (Pérez, Sunyer, & Künzli, 2009; Vert et al., 2017); and, converting a substantial portion of the 60% of space occupied by car use into not only public pedestrian-oriented but also multiple-use space for leisure (e.g. playgrounds), neighborhood interaction, and activity (local festivals, etc.).

Reflecting the 2013 Green Infrastructure and Biodiversity Plan for

[4] For a more specific description, see Barcelona Ecologia, the public agency in charge of the superblock project implementation: http://www.bcnecologia.net/es/modelo-conceptual/supermanzana

[5] Specifically, in La Ribera neighborhood, Ciutat Vella (Old City) district.

[6] See also: https://www.youtube.com/watch?v=ZORzsubQA_M

[7] http://lameva.barcelona.cat/barcelona-pel-clima/ca/pla-clima/resiliencia-i-adaptacio

[8] Those figures referred to earlier data; more recent data (2017) show that figures have been reduced down to some 250 persons per year (El Periódico, 2017).

Fig. 1. The superblock in Poblenou.

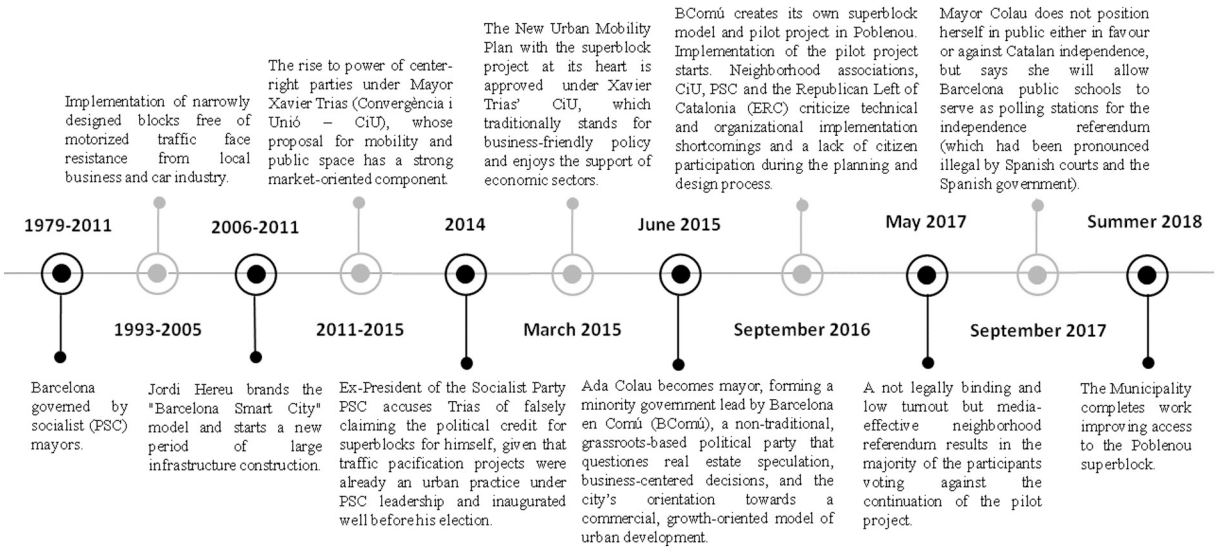

Fig. 2. Timeline for Poblenou superblock project.

2020 (Barcelona City Council, 2013), Barcelona's Commitment to its climate initiative, and Barcelona's adaptation strategy, increasing green spaces and biodiversity to enhance environmental services (i.e. reduction of the effect of heat islands and water retention) while providing new public spaces is also a major focus of the superblock project. A 2014 City of Barcelona report highlights:

> "In order to reduce the heat island effect […], the management of public space with the creation of new green spaces, the introduction of plant species that generate large areas of shade and the creation of green corridors in urban Barcelona will be essential" (Calvet, Biosca, & Ulied, 2014).

The role of green infrastructure for adaptation efforts is well-established (Gill, Handley, Ennos, & Pauleit, 2007), particularly when it comes to adaptation to heat waves and the reduction of heat islands (World Health Organization, 2016). According to the World Health Organization (2012), urban green spaces can strengthen cities' long-term resilience to both climate change and natural disasters. Yet, with only 7 m^2 of green space per inhabitant (in (World Health Organization, 2012) some districts 1.85m^2), Barcelona lacks green spaces in its urban (World Health Organization, 2016)environment (Barcelona City Council, 2013). By establishing biodiversity conservation and the increase of urban green as two primary objectives, superblocks help further advance adaptation efforts, a role which has led to the formal inclusion of superblocks within Barcelona's climate action plans (Fig. 2).

In sum, Barcelona's superblock program is an intervention into multiple dimensions of urban life and structure, and cannot be taken exclusively as a policy reaction to climate change. Still, adaptation actions are scarcely ever interventions at only one level, as the multi-dimensional character of the climate challenge requires efforts to address risks associated with either multiple stresses faced by certain

ecosystems or the multiple effects of climate change (Füssel & Klein, 2006). This could explain the integration of superblocks into the city's principal policy initiatives as regards climate action, namely Barcelona's Climate Action Plan and the Barcelona Commitment to the Climate initiative. In essence, the superblocks were a vision for transforming the city of Barcelona that both shaped and was shaped by more recent climate adaptation goals.

2.2. Superblocks: A radical intervention that provides a window into the everyday politics of a transformational adaptation

When considering the definitions of transformational adaptation provided in our introductory sections, several elements of the superblocks initiative establish its transformational nature. First, the initiative – now fully incorporated into the city's climate action plan – is an intense, non-linear intervention at an enlarged (citywide) scale that aims at reordering the city's mobility systems, and drastically reordering Barcelona's urbanism. Given that 503 superblocks covering the entire city are planned for implementation, this is a large-scale, major project that would transform Barcelona intensely in physical, social, economic, and environmental terms by, as stated by one city government representative, "radically changing the city". The scale and structure of the project conform with a transformational adaptation initiative.

Second, the superblock project combines climate mitigation and climate adaption goals. With the superblock project at its core, Barcelona's Urban Mobility Plan 2013–2018 (PMU) is a key element of Barcelona's climate action strategy due to the expected impact of turning car-occupied streets into public green spaces at a large scale, creating bike lanes within and around the superblocks (thus promoting alternative, clean mobility through new infrastructure), and improving local bus networks. Given that the strategic framework of the superblock is also based on Barcelona's Commitment to Climate and its Green and Biodiversity plans, the project is a striking example of a hybrid climate intervention which combines mitigation and adaptation efforts: It seeks to mitigate emissions by adapting the city model to climate change induced threats, while seeking to reduce vulnerability and increase resilience. This view is shared by the Executive of Barcelona's Urban Development Agency, which developed the superblock model and planned its implementation. Consequently, Barcelona's Climate Plan recognizes the extension of the superblock until 2030 as an important measurement for its strategic axes 'Mitigation', 'Adaptation and Resilience', and 'Climate Justice' and stresses both, the superblock's mitigation and adaptation efforts. The project aims at cutting down CO_2 emissions per capita by 40% and reducing climate change-induced heat island effects, or localized temperature spikes (Martín-Vide, Artola, Cordobilla, & Moreno, 2015).

The intention to use superblock green spaces for reducing the heat island effect signifies an adaptation initiative, whereas the intention to reduce the city's contribution to CO_2 emissions points to an initiative aimed at mitigating climate change. This dual environmental purpose is a key characteristic of transformational adaptation (Ribot, 2011, IPCC, 2014 quoted in Pelling et al., 2014: 2). The superblock is also a type of adaptation recently described as "valuable" in the latest IPCC report (p.25), namely a class of "adaptation options that also mitigate emissions [which] can provide synergies and cost savings in most sectors and system transitions, such as when land management [see: superblock] reduces emissions [see: traffic reduction with superblocks] and disaster risk [in the case of Barcelona superblocks: reducing the risk of high mortality during heatwave episodes by reducing the heat island effect with urban greening provided by the superblock]". In short, because superblocks blur the line between adaptation and mitigation and integrate profound land use and policy changes at a large scale, the initiative moves closer to transformational status, especially since mitigation seeks to address the generating forces of climate change (e.g. carbon emissions).

Third, while incremental urban adaptation might solely aim at adapting to the consequences of climate change, transformational adaptation actions like the superblock go further and seek to produce fundamental alterations within the urban system that itself produces climate change vulnerability. The municipal government stresses that it seeks a "new urban model" (Barcelona City Council, 2017), and the superblock project questions the current paradigm of urban development based on car hegemony over public space. According to the Urban Ecology Agency of Barcelona, black asphalt and car emissions bear the majority of responsibility for urban heat islands (Rueda, 2016) and transportation is a major source of greenhouse gas emissions in cities. By cutting down CO_2 emissions drastically, reordering the urban mobility system, and turning streets systematically into green, public space at a large scale, the project aims at radically changing the underlying logic that produces increased rates of climate change vulnerability both in the city and elsewhere.

All in all, the superblock intervention combines the core characteristics of transformational adaptation as defined above based on existing literature: climate change serves as the umbrella goal for organizing a series of smaller agendas focused on pollution and health, traffic pacification, noise reduction, and quality of life to produce a non-incremental alteration to the social and mobility system of the city and to profoundly alter land configurations and use. As well, the initiative is framed as a measure that reduces socio-environmental impacts on the most vulnerable social strata by combining adaptation to and mitigation of climate change (BCN Ecologia, 2017), and by, according to one executive at the Barcelona Urban Development Agency "radically changing the city" and its land use. Admittedly, the superblock initiative is not explicitly called a 'transformational adaptation' project, but this in part reflects the fact that the term itself is mostly used in academic circles and is not one yet extensively used by policy-makers. Still, this is a multi-dimensional project that serves as a striking example of an action originally "intended to address other problems that can become transformative climate change adaptation" (Kates et al., 2012: 7156). Policy-makers do explicitly refer to superblocks as 'transformational' and 'radical,' and superblocks have been integrated into the city's climate action narrative.

Given its positioning in Barcelona's climate and land use agendas, this is a strong case for viewing the everyday politics that shape the early implementation of interventions with explicit transformational urban adaptation goals. As the superblock intervention questioned the car-oriented model of urban development in Barcelona by ceding roads to public open space, a complex set of political forces mobilized both for and against the changes. This early period of making transformation happen has highlighted the necessity of developing a process-outcome view of the characteristics of transformational initiatives. Throughout, those with the intention to block the project did so by challenging the authority of the current administration, and thus reshaping the nature of the initiative. The extent to which superblocks will, in the end, be a transformational adaptation in Barcelona depends very much on the interaction between the initiative and these ongoing everyday politics. In what follows, we examine the main aspects of the barriers that arose in a pilot implementation. As a novel contribution to the literature on urban adaptation planning and on transformational adaptation, we focus on the ways in which localized struggles for authority serve as a synecdoche of larger institutional barriers to transformational adaptation. We argue that this particular dimension of process – how struggles for authority are managed – is an additional characteristic of transformational urban adaptation not highlighted in the literature.

3. Everyday struggles for the seat of authority

The debate over the Poblenou superblock reveals four aspects of local politics that shape battles over authority, which in turn influence the success of implementing transformational urban policies. First, it demonstrates the fragility of formal municipal authority, especially in

Table 2
Summary of key analytical points.

Political challenges for transformational adaptation	Illustrations from Poblenou Superblock pilot
Overcoming fragility of municipal authority	Countering resistance against the new mayor (Ada Colau), and her non-traditional, grassroots-based political party Fighting opposition to new policies that question real estate speculation, business-centered decisions, and a growth-oriented model of urban development
Gaining political credit	Constructing a vision for Superblocks that moves away from an initial framing of it as a project supporting (automobile) businesses Differentiating oneself from previous center-right governments and imprinting new types of left-wing policies
Controlling economic agenda and political status of the city	Defining and branding the new Barcelona city model Developing municipal policy centered on residents' quality of life and access to an affordable and livable city Making decisions for Barcelona as a *city* with specific environmental needs within a broader context of conflict over Catalonia's independence
Supporting civic participation and envisioning the future of the city	Prevailing over perceptions of lack of transparent, prior communication among the local business community Overcoming perceptions of a project controlled by technocrats (e.g. municipal technicians, and outside experts) and "desk intellectuals", and of a move away from long-term, citizen-driven urbanism Surmounting ideological differences over the city's future growth and development

the context of efforts to create radical change within a pluralist governance system. Second, it shows that the struggle over who gets political credit is a crucial factor that can determine whether a transformative project will go ahead or not. Third, it illustrates the importance of understanding resistance to 'radical' urban transformation agendas within their broader economic and political contexts, namely the context of a city in the epicenter of projects of economic growth and political independence. Finally, it highlights the importance of linking back controversies over implementation policy (public participation, in our case) to the context of political battles for authority. All in all, it is much more than a fight over different visions for environmental or land use policy and planning. Our analytical points are summarized in Table 2 below.

3.1. The fragility of municipal authority

As already explained, early 1990s and 2000s superblock interventions were originally conceived in the context of traffic pacification plans, and involved individual interventions that were not embedded in a larger city-wide mobility plan – as was the case with the Poblenou superblock.

Over the years, the motives and political orientation of traffic pacification policy changed, reflecting a transition in Barcelona in which 20 years of municipal leadership by socialists (1979–2011) was followed by the rise to power of center-right parties (2011–2015). Despite being on the desk of municipal governments for a few decades, the superblock project was not approved until the 2015 Urban Mobility Plan (PMU, 2014) was passed under Mayor Xavier Trias (2011–2015). Trias' proposal for mobility and public space was mainly oriented toward encouraging economic growth. In line with the 'smart city' model (Eurescom, 2018), it aimed at using technological innovation to attract high end developers and residents through provision for electric vehicles – and their growing market – and for continued routes for private cars alongside public transit and bikes as part of a diverse strategy for increasing urban mobility choices (La Vanguardia, 2014a; PMU, 2014). Trias was a member of the former center-right party Convergència i Unió (CiU), which traditionally stood for business-friendly policies and gained the trust of local economic sectors to secure the city council's approval for the plan.

In contrast, the Poblenou superblock was implemented by the left-wing mayor Ada Colau who was elected in May 2015. Known for her activist past as a founding member and public face of the campaign against residential evictions in Spain,[9] Colau was elected on the ticket of a citizen initiative set up to contest municipal power from traditional political parties. Colau's election marked the first time in the city's history since the transition to democracy in 1978 that municipal elections were won by a non-traditional, grassroots-based political party, headed by a female leader who questioned real estate speculation, business-centered decisions, and the city's orientation toward a commercial, growth-oriented model of urban development.

But while Colau won the 2015 municipal election backed by popular enthusiasm, her party Barcelona en Comú (BComú)[10] only managed to control 11 out of a total of 41 seats in the city council. This meant that any issue likely to divide public opinion in the city – such as the Poblenou superblock proved to be in 2016 – held potential for opposing parties to make political gains against the mayor and her party.

The vulnerability and threats faced by the Mayor and her new party were reflected in the way the Colau Administration approached the superblock project. From the start, there was pressure from the city's administrative directors for agency staff to successfully – but also quickly – implement the project, as recalled by an elected official from the municipality:

> "We do have the pressure [to implement the project within the mayoral term]. […] And yes you have political guidelines, because in the end it is a political question, and this is renewed every four years."

Those pressures were then channelled into a struggle for political credit, which influenced reactions to superblocks all through the implementation of the project.

3.2. The struggle for political credit

Meanwhile, as the superblock project came to represent a high-profile, radical transformation on a municipal scale linked to a new city model, several municipal political groups sought to claim it as their own, and make it serve their purposes. This push began several years before implementation when former mayor Xavier Trias inserted superblocks into the city's Mobility Plan, framing the intervention at first as one that would serve business interests. In response to Trias' initiative, the leader of the opposition Catalan Socialist Party municipal group accused Trias of falsely claiming the political credit for superblocks for himself (La Vanguardia, 2014b), given that traffic pacification projects were already an urban practice inaugurated well before his election.

Similarly, Trias' political group accused the BComú municipal government of trying to claim credit for political innovation through the implementation of the Poblenou superblock. Just as Trias was said to

[9] Also known as Platform for People Affected by Mortgages (PAH from its initials in Spanish, standing for Plataforma de Afectados por la Hipoteca), see: http://afectadosporlahipoteca.com/

[10] Barcelona in Common – in Catalan Barcelona en Comú (previously known as Guanyem Barcelona).

have co-opted the idea, his party said Colau co-opted the idea. Thus, in order to increase its ownership of the superblock initiative, instead of launching the Poblenou pilot project as it had been planned over a long period by the previous municipal government, BComú opted for creating a new proposal from scratch just a few blocks away. For Poblenou superblock opponents, that decision meant that the ability to claim project ownership and differentiate oneself from previous center-right governments was prioritized over careful planning. One former CiU Councilor explained:

> "Colau could have implemented [this planned superblock] […] if she had wanted to. And why didn't they do this? Because everything had already been done. So, this way they couldn't have said that it was them [stress added] who did the superblocks! Because [those] who developed it were the ones who were [in power] before. But it's a political issue of 'no, no, this [project] was mine."

In the minds of many of those involved at the time, there was a lot at stake with regard to where the credit for the superblock project went. Project success might ensure an indelible new political heritage in Colau's favour. If a transformation of this nature, which some linked as far back as the unrealized vision of Barcelona's XIXth century acclaimed planner, Ildefons Cerdà, was accomplished by Colau, then it would certainly burnish her image and very possibly mean that her citizen-centered rather than Trias' business-centered vision for a green city would prevail in the long term. Given the scope and media attention afforded to the project, such a victory would be accompanied with international legitimacy for the current Administration. In that sense, the progressive agenda of BComú represented a risk to the political establishment. The same Urban Development Agency executive quoted above explained:

> "long-established [forces], which cannot tolerate that their power is taken away. So, they have to try to annihilate it [the threat to that power]."

As a result, the local political opposition saw high stakes in contesting who got credit for what. Before the Poblenou superblock had a contentious public identity, both those for and against the Colau Administration jockeyed for the right to claim ownership over the transformational aspects of the project and (re)gain the lead position in superblock implementation. It was a struggle over what transfromation meant and the efforts for appropriation led to even more intensive political polarization, where, according a local Poblenou business owner:

> "all right-wingers [were] up against the superblocks because they have been the proposal of BComú".

Such polarization coincided with disagreements on a number of key matters in both the economic and political realms, as we explain in the following section.

3.3. A contestation over the economic agenda and political status of the city

Those tensions were coupled with a fear among more conservative interests that the project represented a wider attempt to push an anti-economic growth agenda. Some residents termed the BComú approach as "fanatical radicalism," (El Nacional, 2017) which they saw as rejecting economic growth. The paramount concern of those opposition parties was to prevent BComú from defining and branding the new Barcelona city model in ways that might threaten certain historic business and economic interests and the privileged access of those interest groups to local government through established social networks. This concern, indeed, extended far beyond the design and implementation of superblocks to other early decisions from Ada Colau, such as cancelling municipal subsidies for the Formula 1 Barcelona circuit (Marca, 2015) and banning licenses for the construction of new hotels (El País, 2015). Superblocks became for many a means of addressing these wider concerns. The ex-spokesman of the previous municipal government party (CiU), Joaquim Forn, expressed this point in 2016 (El Perfiódico, 2016):

> The superblock became a "botched job" thanks to "[t]he anti-private vehicle obsession of Ada Colau's government".

Claims such as these indicate how criticisms were as much against an agenda which included developing municipal policy centered on residents' quality of life, access to an affordable city, anti-mass tourism, citizen-driven public spaces, and non-traditional models of local economic development,[11] as they were against the superblock initiative itself. Ada Colau has indeed been vocal in her rejection of a Barcelona city model tailored to the interests of entrepreneurs, star architects, real estate investors, and tourist industry business owners (Capel, 2005, 2007; Delgado, 2007; Montaner, 2004). However, the characterization of her actions as an "anti-private vehicle obsession" was representative of the hyperbole used by her opponents to describe these positions as dangerously radical and untethered to reality. As a result, the superblock conversation shifted from a battle over credit to one where the initiative was portrayed as an extreme expression of the dangerous radicality of the Colau Administration. Much of the opposition, which had previously supported and voted for the project, saw it as an existential threat.

Moreover, left-wing parties other than BComú, such as the independentist Republican Left of Catalonia (ERC)[12] did not rally to support the project (Catalunyapress, 2017). Rather, the political vulnerability around superblocks that right-wing parties had manufactured became also relevant for left wing debates over independence for the Spanish Autonomous Community of Catalonia. Here one needs to keep in mind that Barcelona is the largest Catalan city and the capital of Catalonia, which goes some way in explaining its economic importance and political status. Left wing parties that favored independence of Catalonia from Spain did not see in Ada Colau a partner for their cause – from which Colau separated herself although she politically and materially supported a referendum for independence. Since May 2016, when Colau moved into a pact with the Socialists for governing the City Hall, ERC became less cooperative to the projects of a mayor who closely collaborated with a party (Socialists) that would not support Catalan independence.

In those ways, superblocks became a symbol for deeper ideological divides over who should benefit from Barcelona's growth model and got indirectly embroiled in the question of whether Catalonia should be independent – much more than disagreements over sustainability, climate, or environmental policies at large. As a result, societal opposition against the project partly emerged or became heightened because those who did not agree with the ideological orientation of the party in the municipal seat of power were against any project they perceived as being connected to it and the mayor. According to one ERC City Councilor:

> The government of Colau is a government of passion for and against it. […] And now it's not 'the superblocks of Barcelona', it's 'the superblocks of Colau'. [...] Those who are against the party, government or the person itself are against the project.

Therefore, the more transformational the project, the more opposition it gathered because the political net of issues associated with it grew wider. As a consequence, transformation translated into political vulnerability. The right way to address climate mitigation and adaptation

[11] See Colau's interview with Al Jazeera in 2017: https://www.aljazeera.com/programmes/talktojazeera/2017/04/barcelona-mayor-city-losing-identity-170412082645192.html and Barcelona en Comú's 2015 program: https://barcelonaencomu.cat/sites/default/files/programaencomun_cast.pdf

[12] From its initials in Catalan: Esquerra Republicana de Catalunya (Republican Left of Catalonia)

and the best mode for increasing urban mobility had very little to do with the opposition that formed around the Poblenou superblock.

3.4. Participation complaints and clashing visions of the city

Last, the fight over the seat of authority was linked to a public conversation over participatory democracy associated with the Poblenou superblock. Perceptions of exclusion from the implementation process were the most often-reported reasons for neighborhood residents and businesses to reject the project. Importantly, exclusion complaints were tied to the fundamental, ideological differences over the city's development vision. In their own words, many residents and local business owners were taken by surprise as the superblock was inaugurated in the middle of the 2016 summer vacation without any previous warning or announcement. One Neighborhood Association representative described this surprise:

> We deny that a participatory process has happened. [...] [At the beginning of September] some placards began to appear in our neighborhood, but the municipality did not explain the superblock. They explained it eight days later more or less [after implementation had happened]. […] If there were a real open participatory process, surely […] the acceptance would have been much bigger. [That] would change the situation for businesses as well.

Owners of car shops and automobile repair shops were particularly taken-aback by the implementation of the superblock and became vocal early on in Fall 2016 about their opposition to the project. They argued that the project was not implemented with transparent prior communication about its possible business impacts and showed insufficient protection for established economic activities in the neighborhood – especially car dealers and mechanics. In the words of one car repair shop owner:

> We are an automobile repair shop, we make fast repairs of vehicles. [Before], many people passed [on their way] … to the center of Barcelona. [...] This traffic has been greatly reduced. Also billing levels are falling.

But beyond implementation shortcomings, exclusion complaints also expose fundamental, ideological differences over the city's growth and development vision, linking back to clashing visions of and for the city. In that context, local automobile-oriented businesses became a centerpiece of the opposition adding strength to wider efforts from pro-growth interests and the pro-independence left to undermine the Administration with critiques of the participation process. Car dealers and mechanics, and a cohort of local residents strongly endorsed the view that the superblock's final design and location was imposed by technicians, outside experts, and “desk intellectuals” advancing a radical intervention rather than the incremental and flexible project that local residents preferred. Embedded in that criticism of top-down implementation, the neighborhood referendum was meant to corrode the ideological stance of BComú and challenge its commitment to citizen-driven urbanism. A neighborhood resident argued:

> The referendum is a political lever [...]. [It] also serves to put in contradiction the fundamental speech of Colau. Grassroots participation, referendum for everything, it seemed like Switzerland. Now we are expressing a contradiction in her basic discourse.

Local residents and businesses linked exclusion complaints to a more fundamental rejection of transforming mobility patterns in the area. Local opponents argued that the section of Poblenou where the project was deployed is not an area where social interaction and mixed uses in public spaces have ever been valued by citizens, and that local residents had never expressed a need for public space interventions. Simultaneously, in the mind of local opponents, the superblock elicited a cognitive dissonance with accepted socio-cultural habits that are essential to a “modern” city. Participation complaints became in some ways a proxy for the unease raised by this cognitive dissonance. This was a struggle that goes to the heart of what was trying to be transformed. The same neighborhood residents commented:

> For [BComú], the discourse is ‘we must recover space occupied by cars’ […]. We don't want them to put all that stuff on the streets, children's games and so on. There is no need to put that in the middle of the street. […] It's empirically established, since 10,000 years or 20,000 years ago: there is more economic activity in places where people pass through.

Here, one cannot overlook the continued image of Barcelona in the minds of many residents as a city with remnants of rural and so-called “underdeveloped” characteristics that were quite present in the 1970s and 1980s. Thirty to forty years ago, Barcelona still had informal settlements on the waterfront and outskirts of the city, called “barracas”[13] (Andrés Creus, 2011) and the presence of donkeys and chickens on the streets was a sign of a not-so-remote “backward” (Álvarez, Oliva, & Cadena, 2017) past which many want to forget. The stance of many superblock opponents reflected a rejection of how authorities aimed at defining the still-emerging vision of a “modern”, developed, and livable Barcelona. And of course, the mayor's opponents in the struggle for municipal authority were happy to leverage this schism. As one center-right City Councilor said:

> We cannot imagine a world in which the private vehicle can be dispensed with.

4. Discussion and conclusions

This paper proposes the Barcelona superblocks as a case that highlights the importance of everyday local politics – and specifically struggles for authority – in determining whether an initiative with transformational adaptation goals ever achieves that status. It responds to knowledge gaps around the role of political barriers and power relations in transformational urban practice by detailing how and why transformational adaptation is not only about the character of the initiatives themselves but also the period of making transformation happen. During this period, the more transformational an inititiative seeks to be, the wider its political net becomes. In all, we have inquired as to which barriers emerge and how, when authority tries to pursue transformational action at the city level and faces resistance, and what these political dynamics tell us about best ways of implementing transformational adaptation at the urban level.

Having in mind that urban adaptation practices are still lagging behind in complying with the increasing academic calls for transformational approaches, this case study shows that the underlying drivers of barriers to urban transformational adaptation initiatives are to be found in political struggles for authority. As our analysis demonstrates, challenges to implement urban climate adaptation planning of a transformational nature are more driven by competitive urbanism and related short-term political gains than by the contested importance of environmental benefits framed by those interventions. Because of the scope of changes needed, transformation adaptation is a fight involving political ideology, urban development, market forces and globalization, and political transitions and self-determination more than it is a fight over different visions for environmental policy and planning.

In short, we argue that the criterion ‘resolves local struggles for authority’ is a necessary condition for transformational urban adaptation that is not explicitly labelled as such in the literature and should be added to our understanding of what is transformational. In an outcome-only view of urban transformational adaptation, this process-oriented quality is left off. However, the case analysed here shows that it is not

[13] http://www.lavanguardia.com/libros/20111109/54237962987/barracas-de-barcelona-memorias-contrastadas.html

less central to the transformational capacity of an urban intervention than the other more outcome-oriented qualities that have been a focus of the literature. This is the main lesson of the Barcelona case. In order for an initiative to move beyond incremental approaches, the initiative itself must have transformational outcomes, but must also be accompanied by a transformational process of resolving local struggles for authority.

Our analysis of the pilot superblock in Poblenou shows that the contestation of authority that materializes in clashes over profound ideological differences and deeply held norms are key elements of the multi-scalar political nature and challenges facing transformational urban adaptation. This in turn tells us something about the factors specific to urban adaptation to climate change that shape urban politics and power struggles. In particular, a major challenge of implementing transformational adaptation strategies relates to the non-linear, radical and transformational character of those interventions. This element turns transformational adaptation to a type of urban planning that challenges established development pathways by questioning the very essence of a system, including the political economic structures that underpin urban development. Hence, it inevitably comes up against issues of power and is rarely met with political consensus. Rather, implementing a project like the superblocks creates an ideological tug-of-war in which the power to frame and enforce interpretations of the city model and visions of the future city is fought out. In that sense, urban transformational adaptation must confront unavoidable socio-political and structural barriers and is at least as much about the fight for power as about transforming material relations, or environmental issues themselves. Far from being solely about the best way to address climate change, environmental policy, or sustainability planning, political barriers to transformational adaptation involve a structural battle over who has the right to design and brand the new model for the city – and who can and/or will harness political gains from it.

In agreement with Kates et al. (2012) we find that behavioural actions that tend to maintain existing resource systems and policies made it difficult to implement the Poblenou superblock. We also find that power, politics and interests have posed considerable barriers (Pelling & Manuel-Navarette, 2011), and that the superblock case showcases that even “well-intentioned governments may be too structurally dependent on the interests of capital and too electorally dependent on the support of the groups who either already have, or aspire to, high consumption and fossil fuel-dependent lifestyles” (Godfrey-Wood & Otto Naess, 2016). But beyond those rather general observations about the links between power and transformational adaptation, the implementation of superblocks tells us that, as with climate change itself, climate change adaptation does not take place in a vacuum with relation to everyday life and other political priorities unrelated to “the environment”. It happens, as the Barcelona case reveals, while people continue with their “business-as-usual” activities, which include running a business and commuting by car; engaging in political manoeuvring (including efforts to acquire political credit) in the effort to get hold of or maintain institutional power; and, pursuing, or frustrating other political projects (e.g. independence in the Catalan case).

Transformational action to adapt to climate change should pay heed to such everyday obstacles, which relate not only to ways in which authority is either imposed upon or internalised by subjects (e.g. evident in reactions to change deep-seated habits such as reducing car use, and in the tendency to construct images of neighborhood as a space primarily for commercial activity), but also with the practical politics of the hunt for the seat of authority, for acquiring the supreme, legitimate right to decide for “the collective” (the city and its citizens in this case) and the vision for its future. Here, our findings reflect previous urban climate adaptation research underlining the role of climate champions for pushing forward adaptation agendas and interventions, such as those in Quito and Durban, where climate leaders managed to integrate adaptation interventions into sustainability practices and build on existing successes and capacities (Carmin et al., 2013). They are also in line with recent research in Durban and Indore which argues that adaptation actions must be led considering the powerful, and often entrenched, political economic forces and interest that shape urban development (Chu et al., 2017). However, our paper is novel in highlighting how civic and political contestation of champions' authority to decide can jeopardize transformational adaptation achievements – and the political survival of champions themselves.

Indeed, the entanglement of climate change adaptation in struggles for authority in Spain is not an isolated characteristic of the Barcelona superblock case. In August 2017, the Catalan regional parliament passed the Catalan Climate Change Bill into law (The Climate Group, 2017). Although hailed internationally for its ambition and boldness (The Climate Group, 2017), the response of the Spanish government was to challenge the law in court. The rationale for doing so was essentially (and inter alia) that conceding to the Catalan parliament the capacity to legislate for issues related to climate change would imply accepting the taking over of state competences and acknowledging to Catalonia legislative capacities that correspond to an independent state (El País, 2017). Although the Spanish Constitutional Court recently ruled against the Spanish government (El Periódico, 2018), the case serves to highlight how attempts to respond drastically to climate change challenges (the Catalan law aspires to make Catalonia 100% carbon free by 2050) in Spain are entangled with struggles around capturing or holding the seat of legitimate authority, even more so now with the political battle over the independence of Catalonia. Once again, this suggests that large-scale and deep transformations can be obstructed not only out of fear for the actual material and political effects of transformation per se, but also because of the message they convey as concerns who has the authority to decide for “the common good”.

As concerns implementation lessons at the urban level, we find that the key barriers that emerged in the Barcelona superblock project were related not only to the political struggle for capturing municipal authority, but also to discontent over public participation aspects of project implementation and a perceived imposition of authority. Planning initiatives that aspire to alter urban spaces along transformational adaptation lines should try to foresee how to engage with such reactions during project implementation. In that sense, our findings coincide with other calls for genuine participation processes (Gillard et al., 2016) and for creation of spaces of engagement and negotiation (O'Brien et al., 2015). Nevertheless, our findings provide mixed insights as concerns the alleged capacity of pluralism to produce “more ambitious and politicized visions of the future”, and the potential of discord and instability in micropolitics to provide “potent opportunities for innovation and change to emerge” (Gillard et al., 2016), as in the Barcelona superblock case pluralist politics became the lever for blocking a transformational initiative. This should not be taken as advocacy for authoritarian green politics or collective decision-making in general, but as a reminder of the contradictions of pluralism in search of sustainable solutions. Relatedly, the prioritization by local shop owners of potential economic losses from the implementation of superblocks is in line with Pelling et al. (2015) who explain that in participatory methodologies there is a tendency for communities to prioritize immediate risks or needs.

5. Concluding remarks

The superblock case puts in evidence that urban transformational adaptation must confront unavoidable socio-political barriers and allow for the construction of coalitions that can build together common imaginaries about the future of the city. The evolution of the initial superblock conflict during 2017 and 2018 and the subsequent greater public acceptance of the superblocks[14] also shows that, as

[14] https://cat.elpais.com/cat/2018/09/29/catalunya/1538246791_684437.html

transformational land-use planning later integrates more defined benefits or features (i.e., playgrounds, trees and plants, street infrastructure) and as those provide new social benefits, the mid- to long-term evolution seems to strengthen the ability of transformational interventions to be operationalized on the ground. This is an important lesson for other cities planning to conduct such structural land use changes for transformational adaptation – brave politics that take on struggles for authority in the short-term are needed to achieve mid- to long-term transformational goals.

In that sense, other cities should also take into consideration that urban transformational adaptation is more about the fight for urban political power – as related to city vision, stakeholder participation and governance, and the distribution of the material benefits of economic modernity – and competitive urbanism at the local and global scales (this is especially important for a city like Barcelona, often held internationally as posterchild for progressive and innovative urbanism), than about environmental issues themselves. The municipality is planning new superblock interventions over the next few years, each of them with its own urban development challenges – the main second superblock was completed in January 2020 in the neighborhood of Sant Antoni amidst concerns over gentrification and tourism massification in downtown Barcelona. Concerns in Sant Antoni are also fueling more recent concerns and activism against gentrification around the Poblenou superblock. The aftermath of the 2019 municipal elections – through which Ada Colau is now governing in a coalition with the PSC socialist party *but* also with with fragile and temporary support from the other left (independentist) party ERC – promises therefore to place such interventions at the center of new political struggles for (future) authority and for deciding the urban future of the city.

Author contribution statement

CZ and KK conceived the initial idea. CZ, KK, JC and IA designed methodology and analytical framing. KK collected and analysed the data. All authors discussed the results, wrote the manuscript and gave final approval for publication.

CRediT authorship contribution statement

Christos Zografos: Conceptualization, Methodology, Writing - original draft, Supervision. **Kai A. Klause:**Conceptualization, Methodology, Formal analysis, Writing - original draft. **James J.T. Connolly:**Conceptualization, Methodology, Writing - original draft, Supervision. **Isabelle Anguelovski:**Conceptualization, Methodology, Writing - original draft, Supervision.

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References

Álvarez, J., Oliva, V., & Cadena, J. M. (2017). *Barcelona desapareguda de Giacomo Alessandro. Barcelona Llibres. Vol. 2017*. Barcelona: Ajuntament de Barcelona.

Andrés Creus, L. (2011). *Barraques. La lluita dels invisibles. Pròleg de Pasqual Maragall.* Ara llibres*Vol. 2013*. Barcelona: Serie H.

Anguelovski, I., Shi, L., Chu, E., Gallagher, D., Goh, K., Lamb, Z., ... Teicher, H. (2016). Equity impacts of urban land use planning for climate adaptation: critical perspectives from the global North and South. *Journal of Planning Education and Research, 36*(3), 333–348. https://doi.org/10.1177/0739456x16645166.

Ara.cat (2018). La superilla del Poblenou, finalista del Premi Europeu de l'Espai Públic Urbà 2018. https://m.ara.cat/cultura/Superilla-Poblenou-Premi-Europeu-Public_0_2012198997.html, Accessed date: 24 May 2018.

Araos, M., Berrang-Ford, L., Ford, J. D., Austin, S. E., Biesbroek, R., & Lesnikowski, A. (2016). Climate change adaptation planning in large cities: A systematic global assessment. *Environmental Science & Policy, 66*(December 2016), 375–382.

Bahadur, A. V., & Tanner, T. (2014). Transformational resilience thinking: Putting people, power and politics at the heart of urban climate resilience. *Urbanization and Environment, 26*(1), 200–214.

Barcelona City Council (2012). *Compromiso Ciudadano por la Sostenibilidad 2012–2022*.

Barcelona City Council (2013). Medi Ambient i Serveis Urbans-Hàbitat Urbà. *Barcelona green infrastructure and biodiversity plan 2020*.

Barcelona City Council (2014). *New urban mobility plan of Barcelona 2013–2018*.

Barcelona City Council (2015). Hàbitat Urbà-Medi Ambient i Serveis Urbans. *Plan to improve air quality in Barcelona 2015–2018*.

Barcelona City Council (2017). Presentació Superilles. http://ajuntament.barcelona.cat/superilles/es/presentacion, Accessed date: 10 April 2018.

Bassett, T. J., & Fogelman, C. (2013). Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum, 48*, 42–53.

BCN Ecologia (2017). Porque supermanzanas. http://bcnecologia.net/es/porque-supermanzanas, Accessed date: 27 May 2018.

Bicknell, J., & Dodman, D. (Eds.). (2009). *Adapting cities to climate change: Understanding and addressing the development challenges*. Earthscan: London.

Calvet, M., Biosca, O., & Ulied, A. (2014). *Ajuntament de Barcelona. Anàlisi dels plans d'adaptació al canviclimàtic*.

Capel, H. (2005). *El Modelo Barcelona: un examen crítico*. Santiago: Eure.

Capel, H. (2007). El debate sobre la construcción de la ciudad y el llamado 'Modelo Barcelona'. *Scripta Nova — Revista Electrónica de Geografía y Ciencias Sociales, 11*(233), 741–798.

Carmin, J., Dodman, D., & Chu, E. (2013). *Urban climate adaptation and leadership: From conceptual understanding to practical action. OECD regional development working papers, 2013/26*Paris: OECD Publishing.

Catalunyapress (2017). La oposición se une a los vecinos y exige la retirada de la superilla de Poblenou. http://www.catalunyapress.es/texto-diario/mostrar/745073/oposicion-une-vecinos-exige-retirada-superilla-poblenou, Accessed date: 29 May 2018.

Chu, E., Anguelovski, I., & Roberts, D. (2017). Climate adaptation as strategic urbanism: Assessing opportunities and uncertainties for equity and inclusive development in cities. *Cities, 60*, 378–387.

Chu, E. K. (2015). The political economy of urban climate adaptation and development planning in Surat, India. *Environment and Planning C: Government and Policy, 0*, 1–18. https://doi.org/10.1177/0263774X15614174 2015.

Chu, E. K. (2017). Urban climate adaptation and the reshaping of state–society relations: The politics of community knowledge and mobilisation in Indore, India. *Urban Studies, 42098016686509*.

Connolly, J. J. T. (2018). From systems thinking to systemic action: Social vulnerability and the institutional challenge of urban resilience. *City & Community, 17*(1), 8–11.

Delgado, M. (2007). *La ciudad mentirosa: Fraude y miseria del modelo Barcelona.* Barcelona: Libros de la Catarata.

Di Giulio, G. M., Bedran-Martins, A. M. B., da Penha Vasconcellos, M., Ribeiro, W. C., & Lemos, M. C. (2018). Mainstreaming climate adaptation in the megacity of São Paulo, Brazil. *Cities, 72*, 237–244.

Du, J., Mahendra, A., Chu, E., Brown, A., Michael, K., Shuaib, L. (2019) Unlocking the potential for transformative climate adaptation in cities. World Resources Institute. background Paper Series. . Available at: https://wrirosscities.org/research/publication/unlocking-potential-transformative-climate-adaptation-cities

EEA (European Environment Agency) (2016). *Urban adaptation to climate change in Europe 2016 — Transforming cities in a changing climate. EEA report no. 12/2016*. Copenhagen: EEA.

El Nacional (2017). Albert Acín. *Los críticos de la supermanzana del Poblenou exigen cambios a Colau.* https://www.elnacional.cat/es/bcn-hub/supermanzana-poblenou-oposicion-vecinos_131883_102.html, Accessed date: 22 April 2018.

El País. Barcelona mayor introduces one-year ban on new tourist accommodation. (2015). https://elpais.com/elpais/2015/07/02/inenglish/1435828213_655223.html (Accessed 05/16/2018).

El País (2017). Manuel Planelles. El *Gobierno frena el intento de Cataluña de cerrar las nucleares en diez años*. https://politica.elpais.com/politica/2017/11/03/actualidad/1509723721_533265.html, Accessed date: 29 May 2018.

El Periódico (2016). Cristina Savall. La 'superilla' divide al Poblenou. https://www.elperiodico.com/es/barcelona/20160912/experimento-superilla-poblenou-provoca-debate-divide-vecinos-5375063, Accessed date: 29 May 2018.

El Periódico (2017). Superar los límites de contaminación causa 250 muertes anuales en Barcelona. https://www.elperiodico.com/es/sociedad/20171129/superar-los-limites-de-contaminacion-causa-250-muertes-anuales-en-barcelona-6458997, Accessed date: 16 May 2018.

El Periódico (2018). El Tribunal Constitucional levanta la suspensión de la ley catalana del cambio climático. https://www.elperiodico.com/es/medio-ambiente/20180414/tribunal-constitucional-levanta-suspension-ley-catalana-cambio-climatico-6757732, Accessed date: 29 May 2018.

Eriksen, S. H., & Brown, K. (2011). Sustainable adaptation to climate change. *Climate and*

Development, 3(1), 3–6.
Eriksen, S. H., Nightingale, A. J., & Eakin, H. (2015). Reframing adaptation: The political nature of climate change adaptation. *Global Environmental Change, 35*, 523–533.
Eurescom (2018). Becoming smart is a transitional process. Interview on smart cities with Xavier Trias, former mayor of Barcelona. https://m.eurescom.eu/news-and-events/eurescommessage/eurescom-message-winter-2015/becoming-smart-is-a-transitional-process-interview-on-smart-cities-with-xavier-trias.html (web archive link, 10 May 2018) Accessed 05/10/2018. http://bcnecologia.net/es/porque-supermanzanas. .
Fairhead, J., Leach, M., & Scoones, I. (2012). Green grabbing: A new appropriation of nature? *Journal of Peasant Studies, 39*, 237–261.
Fieldman, G. (2011). Neoliberalism, the production of vulnerability and the hobbled state: Systemic barriers to climate adaptation. *Climate and Development, 3*(2), 159_174.
Füssel, H. M., & Klein, R. J. (2006). Climate change vulnerability assessments: An evolution of conceptual thinking. *Climatic Change, 75*(3), 301–329.
Gill, S. E., Handley, J. F., Ennos, A. R., & Pauleit, S. (2007). *Adapting cities for climate change: The role of the green infrastructure.* Built Environment*Vol. 33*, Alexandrine Press115–133 Number 1, 13 March 2007. (19).
Gillard, R., Gouldson, A., Paavola, J., & Van Alstine, J. (2016). Transformational responses to climate change: Beyond a systems perspective of social change in mitigation and adaptation. *Wiley Interdisciplinary Reviews: Climate Change, 7*(2), 251–265.
Glavovic, B. C. (2008). Sustainable coastal communities in the age of coastal storms: Reconceptualising coastal planning and ICM as “new” naval architecture. *Journal of Coastal Conservation, 12*(3), 125–134.
Godfrey-Wood, R., & Otto Naess, L. (2016). Adapting to climate change: Transforming development? *IDS Bulletin, 47*(2).
Hadarits, M., Pittman, J., Corkal, D., Hill, H., Bruce, K., & Howard, A. (2017). The interplay between incremental, transitional, and transformational adaptation: A case study of Canadian agriculture. *Regional Environmental Change, 17*(5), 1515–1525.
IPCC (2014). In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, ... L. L. White (Eds.). *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and Sectoral aspects. Contribution of working group II to the fifth assessment report of the intergovernmental panel on climate change*Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press (1132 pp).
Kates, R. W., Travis, W. R., & Wilbanks, T. J. (2012). Transformational adaptation when incremental adaptations to climate change are insufficient. *Proceedings of the National Academy of Sciences, 109*(19), 7156–7161. https://doi.org/10.1073/pnas.1115521109.
La Vanguardia (2014a). Trias apuesta por una reactivación económica con movilidad sostenible. http://www.lavanguardia.com/politica/20140305/54402065089/trias-apuesta-por-una-reactivacion-economica-con-movilidad-sostenible.html, Accessed date: 3 May 2018.
La Vanguardia. PSC afea a Trias que se apropie de ideas viejas y olvide dignidad de barrios. (2014). http://www.lavanguardia.com/politica/20140226/54401773167/psc-afea-a-trias-que-se-apropie-de-ideas-viejas-y-olvide-dignidad-de-barrios.html (Access 05/29/2018).
Lang, S., & Rothenberg, J. (2017). Neoliberal urbanism, public space, and the greening of the growth machine: New York City’s s park. *Environment and Planning A, 49*(8), 1743–1761.
Lonsdale, K., Pringle, P., & Turner, B. (2015). *Transformative adaptation: What it is, why it matters & what is needed.* Oxford, UK: UK Climate Impacts Programme, University of Oxford.
Lubell, M., Feiock, R. C., La Cruz, D., & Ramirez, E. E. (2009). Local institutions and the politics of urban growth. *American Journal of Political Science, 53*(3), 649–665.
Marca (2015). Ada Colau: “Subvencionar la Fórmula 1 no es la prioridad”. http://www.marca.com/2015/05/27/motor/formula1/1432744515.html, Accessed date: 29 May 2018.
Marshall, N. A., Park, S. E., Adger, W. N., Brown, K., & Howden, S. M. (2012). Transformational capacity and the influence of place and identity. *Environmental Research Letters, 7*(3), 034022.
Martín-Vide, J., Artola, V. M., Cordobilla, M. J., & Moreno, M. (2015). *La isla de calor en el área metropolitana de Barcelona y la adaptación al cambioclimático.* Universitat de Barcelona & Barcelona Regional (BR) (Metrobs 2015).
Montaner, J. M. (2004). *La evolución del modelo Barcelona* (1979–2002). In J. Borja, Z. Muxí, & J. Cenicacelaya (Eds.). *Urbanismo en el siglo XXI: una visión crítica : Bilbao, Madrid, Valencia, Barcelona* (pp. 203–222). (1st). Barcelona: Escola Tècnica Superior d’Arquitectura de Barcelona: Edicions UPC.
Mustelin, J., & Handmer, J. (2013). Triggering transformation: Managing resilience or invoking realchange? *Proceedings of transformation in a changing climate conference, 19–21 June 2013*. Norway: University of Oslo.
Nightingale, A. J. (2018). The socioenvironmental state: Political authority, subjects, and transformative socionatural change in an uncertain world. *Environment and Planning E: Nature and Space, 1*(4), 688–711.
Nightingale, A. J., & Ojha, H. R. (2013). Rethinking power and authority: Symbolic violence and subjectivity in Nepal’s Terai Forests. *Dev. Change, 44*, 29–51.
NY Times (2016). What New York can learn from Barcelona Super Blocks. https://www.nytimes.com/2016/10/02/nyregion/what-new-york-can-learn-from-barcelonas-superblocks.html?mcubz=0, Accessed date: 29 May 2018.
O’Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography, 36*(5), 667–676.
O’Brien, K., Eriksen, S., Inderberg, T. H., & Sygna, L. (2015). Climate change and development: Adaptation through transformation. *Climate change adaptation and development: Transforming paradigms and practices*. London: Routledge.
O’Brien, K., & Sygna, L. (2013). Responding to climate change: The three spheres of transformation. *Proceedings of transformation in a changing climate* (pp. 19–21). .
Park, S. E., Marshall, N. A., Jakku, E., Dowd, A. M., Howden, S. M., Mendham, E., & Fleming, A. (2012). Informing adaptation responses to climate change through theories of transformation. *Global Environmental Change, 22*(1), 115–126.
Pelling, M. (2010). *Adaptation to climate change: From resilience to transformation.* London: Routledge.
Pelling, M., & Manuel-Navarette, D. (2011). From resilience to transformation: The adaptive cycle in two Mexican urban centers. *Ecology and Society, 16*(2), 11.
Pelling, M., O’Brien, K., & Matyas, D. (2014). Adaptation and transformation, climatic change. In J. Birkmann, & R. Mechler (Eds.). *Special issue on advancing climate change adaptation and risk management*https://doi.org/10.1007/s10584-014-1303-0.
Pelling, M., O’Brien, K., & Matyas, D. (2015). Adaptation and transformation. *Climatic Change, 133*(1), 113–127.
Pérez, L., Sunyer, J., & Künzli, N. (2009). Estimating the health and economic benefits associated with reducing air pollution in the Barcelona metropolitan area (Spain). *Gaceta Sanitaria, 23*(4), 287–294.
PMU (2014). *Pla de Mobilitat Urbana de Barcelona 2013–2018.* Ajuntament de Barcelonahttp://mobilitat.ajuntament.barcelona.cat/sites/default/files/PMU2013-2018_DocAprovInicial_Parte1_0.pdf, Accessed date: 27 May 2018.
Revi, A., Satterthwaite, D., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R., Pelling, M., ... Sverdlik, A. (2014). Towards transformative adaptation in cities: The IPCC’s fifth assessment. *Environment and Urbanization, 26*(1), 11–28. https://doi.org/10.1177/0956247814523539.
Ribot, J. (2011). Vulnerability before adaptation: Toward transformative climate action. *Global Environmental Change, 21*(4), 1160–1162.
Rickards, L., & Howden, S. M. (2012). Transformational adaptation: Agriculture and climate change. *Crop and Pasture Science, 63*(3), 240–250.
Rueda, S. (2016). *La supermanzana, nueva célula urbana para la construcción de un nuevo modelo funcional y urbanístico de Barcelona.* BCNecología.
Shi, L., Chu, E., Anguelovski, I., Aylett, A., Debats, J., Goh, K., & VanDeveer, S. (2016). Roadmap towards justice in urban climate adaptation research. *Nature Climate Change, 6*(2), 131–137.
Shokry, G., Connolly, J. J., & Anguelovski, I. (2020). Understanding climate gentrification and shifting landscapes of protection and vulnerability in green resilient Philadelphia. *Urban Climate, 31*, 100539.
Sikor, T., & Lund, C. (2009). Access and property: A question of power and authority. *Dev. Change, 40*, 1–22.
Taylor, M. (2014). *The political ecology of climate change adaptation: Livelihoods. Agrarian change and the conflicts of development. Explorations in development studies*Routledge.
Termeer, C. J., Dewulf, A., & Biesbroek, G. R. (2017). Transformational change: Governance interventions for climate change adaptation from a continuous change perspective. *Journal of Environmental Planning and Management, 60*(4), 558–576.
The Climate Group (2017). Catalonia passes climate change law to reduce emissions by 100% by 2050. https://www.theclimategroup.org/news/catalonia-passes-climate-change-law-reduce-emissions-100-2050, Accessed date: 29 May 2018.
The Guardian (2016). Superblocks to the rescue: Barcelona's plan to give streets back to residents. https://www.theguardian.com/cities/2016/may/17/superblocks-rescue-barcelona-spain-plan-give-streets-back-residents, Accessed date: 29 May 2018.
Torabi, E., Dedekorkut-Howes, A., & Howes, M. (2018). Adapting or maladapting: Building resilience to climate-related disasters in coastal cities. *Cities, 72*, 295–309.
True, J. L., Jones, B. D., & Baumgartner, F. R. (1999). Punctuated equilibrium theory. *Theories of the policy process* (pp. 175–202). .
Vert, C., Sánchez-Benavides, G., Martínez, D., Gotsens, X., Gramunt, N., Cirach, M., & Crous-Bou, M. (2017). Effect of long-term exposure to air pollution on anxiety and depression in adults: A cross-sectional study. *International Journal of Hygiene and Environmental Health, 220*(6), 1074–1080.
Warner, B. P., & Kuzdas, C. P. (2017). The role of political economy in framing and producing transformative adaptation. *Current Opinion in Environmental Sustainability, 29*, 69–74.
Whitehead, M. (2013). Neoliberal urban environmentalism and the adaptive city: Towards a critical urban theory and climate change. *Urban Studies, 50*(7), 1348–1367.
WHO (2012). *Health Indicators of sustainable cities in the Context of the Rio+20.* UN Conference on Sustainable Development WHO/HSE/PHE/7.6.2012f.
World Economic Forum (2017). These are the cities with the worst noise pollution. https://www.weforum.org/agenda/2017/03/these-are-the-cities-with-the-worst-noise-pollution/, Accessed date: 27 May 2018.
World Health Organization (2016). *Urban green spaces and health.* Copenhagen: WHO Regional Office for Europe.
Ziervogel, G., Cowen, A., & Ziniades, J. (2016). Moving from adaptive to transformative capacity: Building foundations for inclusive, thriving, and regenerative urban settlements. *Sustainability, 8*(9), 955.
Zografos, C. (2017). Flows of sediment, flows of insecurity: Climate change adaptation and the social contract in the Ebro Delta, Catalonia. *Geoforum, 80*, 49–60.
Zografos, C., Anguelovski, I., & Grigorova, M. (2016). When exposure to climate change is not enough: Exploring heatwave adaptive capacity of a multi-ethnic, low-income urban community in Australia. *Urban Climate, 17*(2016), 248–265.