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Exploring the User-Driven Implications in Building Urban Resilience for Sustainability Transitions: Lessons From OURS CITIES Global Network Study Cases

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Abstract: Smart, green and resilient city paradigms have been mainly promoted through top-down practices and hard infrastructures solutions. However, social networks and community actions have been strengthening the effectiveness of resilience from the ground in many cases. This paper brings at light the key relevance of such socially-driven urban resilience building through bottom up processes by i) situating urban resilience in relation to urban sustainability ii) defining user-driven resilience within urban resilience building frameworks, and iii) highlighting the perceptions and communities roles in building urban user-driven resilience. In order to offer empirical evidences supporting such conceptualization, the paper presents a range of global study cases from OURS CITIES network. The main insights of the paper are that user-driven resilience is still poorly understood and that the same "enablers" for socially-driven urban transition do not work effectively for all the places, but should be framed accordingly to the place cultural values and behaviors.

Keywords: Community Resilience; Urban Resilience; Sustainability Transition; Bogota; South Africa; Saudi Arabia; Energy Saving; Change Actor; Green Infrastructure; Resilience Governance.

1. Social implications of transitioning to sustainable and resilient cities

Resilience entered within the global agendas after '90s, when the post-Rio sustainability paradigm recognized the role of adaptation to different global challenges. However, notwithstanding the success and sprawl of resilience, the links between sustainability goals and resilience strategies become less important than the imperative and normative position of addressing risks reductions through the slogan of "building resilience". Some argue that resilience has already replaced sustainability [1], and more critical positions state that resilience has been used as a label to fit conveniently on top of pre-existing agenda, contributing to the increasing fuzziness of the concept [2]. However, because by 2050 around 75% of global population could be living in urban environment [3] and global urbanization process has been detected as one of the main drivers of global environmental change, urban(ization) resilience emerged as an imperative both for addressing planetary resources challenges, and people safety [4]. This could indeed represent the opportunity to link again resilience and sustainability under the emerging urban agendas [5]. This paper builds on the need and calls for normative principles linking resilience and sustainability in urban systems. In particular, as the title stresses, our main interest rely on exploring and understanding which is the role of people, of city users, within the city resilience building strategies. In order to address this research topic, two main critical assumptions have to be made in re-framing the common and mainstream understanding around urban resilience: i) the shift from the normative and positive notion that building resilience is always good, to a more structured and un-packed understanding of resilience as a concept that should be operationalized through different lenses: the resistance, incremental adaptation or transformation approaches, ii) the social behavioral aspects, bottom-up, community-LED initiatives contributing both to sustainability and disaster risks reductions should be framed within the usually top-down, hard infrastructures and protection oriented strategies building city resilience.

Regarding the first point it is key to distinguish among resistance practices (increasing systems robustness facing shocks or stresses), incremental adaptation (pursuing adaptations at the edge, in order to adapt the system in order to keep it working within a changed conditions) and transformation (in which systems experience a radical change in their structure and functions). These very different approaches rely under the common metaphor of resilience [6,7]. As pointed out from Pearson, adaptation and transformation may have common features, but they may also be very different as adaptation is inward-directed, centripetal and pursuing the maintenance of systems' configuration, while transformation requires centrifugal thinking and the potential for fundamental change [8]. Our current societies, although non-sustainable, are brilliantly resilient and self-reinforcing and "the current political arena favors adaptation because it works to maintain the established order and address near-term problems" [1]Pag37. While for some cases robustness and adaptation must be the normative position in

building resilience (for instance in the case of energy provision continuity, or critical infrastructures) in other cases only transformative patterns of development can pursuit and guarantee the sustainability and long term goals. This paper addresses this transformative perspective of urban resilience building, which has been individuated as a gap in in the scientific knowledge about resilience [9].

While it is key to understand the different facets of resilience in order to better manage which aspect of resilience should be enhanced in order to achieve the sustainability goals, a second key point above mentioned it is to recognize, account and frame the social implications of building resilience within the common top-down practices. As the Rockefeller City Resilience framework stresses, "the roles of civil society has been not properly recognized in providing urban services (-) but it does play a key role as a factor increasing city resilience" [10]. In fact "social practices were many times the main vehicle that communities or cities would use to deal with problems" [10]. Community resilience [11] has been recognized as a fundamental capacity to deal with disasters recovery [12,13] or to boost sustainability transition movements [14]. However, there is a lack of rigorous studies addressing the diverse potential of contributions from community to urban resilience or how these capacities or movements can be framed within integrated urban resilience strategies for long term transitions toward sustainability.

A key research question linking the social implications of building resilience and the previous issue of the different approaches embedded in the resilience metaphor is for example: are these social implications and capacities always linked to sustainability processes (transformative approaches of resilience), or just enhancing the robustness of the city structure and functions?

This paper aim is therefore to propose, by exploring through different case studies, the emergence of such communities capacities (we refers to as "user-driven resilience") and how these relate to sustainability transitions in and for cities. Once proposed these capacities, a second key research question would be to understand how these can be up-scaled and work in synergies within the top-down policies.

The paper is structured in 2 main parts, the first addressing the resilience lens related to the community perception of green infrastructures and its management (case of Bogotá city, Colombia), the second explores the role and effectiveness of change-agents, within urban social networks, in re-shaping more resilient and sustainable uses of urban resources (cases from South Africa and Saudi Arabia). Both sections aim at presenting some evidence based perspectives opening the ground for discussion and further research framing and better accounting city users-driven resilience building.

2. Methods

This paper is built on the evidences and results of the different study cases developed under the project titled "Operationalizing User-driven Resilience for Sustainability in CITIES" (OURS CITIES). The project aim was to explore which actions and community experience could contribute to enhance city resilience by enabling sustainability transitions, building in so doing the ground for an emerging global network (titled OURS CITIES). Before entering the study cases presentation, a literature review was performed in order to frame the concept of user-driven resilience and clarify the relationship between resilience building and achieving sustainability goals.

The first part of the paper introduces the issue related to the community perceptions of the values of decentralized green infrastructures in Bogotá (Colombia). The analyses methods included (i) correlation analysis between the amount of green areas and different social indicators (e.g. population density,

socioeconomic classification and mean household income) and (ii) an online survey distributed between February and April 2015 (n=1400), focusing on willingness of the Bogotá's population to increase green infrastructure at their place of residence as well as the perception of public green spaces' proximity and the frequency of use and type of activities carried out in green areas. From these analyses emerged interesting data on how and what kind of involvement is to be framed in Bogota in order to enhance user-driven management of urban decentralized green infrastructures.

For the second part of the paper, two cases were selected to illustrate the behavioral change aspects related to user-driven resilience for a reduction of the resources consumption. The cases are: the municipality of Makana (South Africa) and Khobar city (Saudi Arabia). All the study cases followed the analytical framework proposed by He and Kua [15], and Kua and Wong [16]. The method conceived the creation of a group of inhabitants to be divided in three equal sub-groups, namely the full treatment (FT) group, the partial treatment (PT) group and the no treatment (control) group. Different types of intervention instruments – namely, pamphlets, stickers and face-to-face discussions and feedback – were used to provide information for promoting electricity conservation in participant households. For the FT group, a combination of pamphlets, reminder stickers, videos, discussions and feedback were used to encourage participants to engage in electricity conservation behavior, while only pamphlets were used for the PT group. Hawthorne effect (corresponding to people modifications or improvement of their behaviors in response to their awareness of being observed) has been observed among these groups in order to measure the sustainability improvements effect when the inhabitants are expected to modify or improve their behavior in response to intervention.

These methods applied to such a different sample of global study cases were intended to explore, and challenge, the "politically correct" aspects of people willingness of contributing to urban resilience and sustainability building. By testing behavioral aspects related to the perception and improvement potential of the management of urban green infrastructures and resources consumption reduction the results of these cases can illustrate the real potential of, and issues related to, people involvement in resilience building on the ground.

3 Results and discussion: toward user-driven resilience "determinants"

As mentioned in the introduction, city resilience has entered the global urban agendas, almost replacing sustainability [4]. However, the city resilience strategies have been mainly related to climate change adaptation and disaster risk reduction or recovery practices. The role of communities in contributing to resilience has been recognized as key, but it's still poorly understood, framed and assessed. It is not clear, for example, which are the "determinants" contributing-enabling urban resilience, linked to sustainability goals and outcomes.

Thus resilience is based on the shifting relationship between scales [7] and between self-sufficiency from one hand and connectivity from the other [17]. The way in which we conceive and balance between resilience principles, or determinant, like modularity or diversity, efficiency or redundancy, is key in order to contribute to build resilience for sustainability, or remain stuck within determinate (sustainable or unsustainable, positive or negative, desirable or undesired) regimes.

Spontaneous initiatives and interventions from individuals, groups, communities are emerging not only in relation to disaster risks management but also fostering sense of place, sustainability and quality

of life (see for example from US the initiative http://www.spontaneousinterventions.org). But which are the determinants for building urban resilience toward sustainability out of these experiences? Which the attitudes, behaviors and real involvement potential of citizen once on the ground?

The two following sections build the preliminary evidences for establishing which are resilience determinants enabling sustainability transitions by reviewing through study cases the relationship between people and the management of decentralized green infrastructures or the energy consumption reduction patterns.

3.1 Community and decentralized green infrastructure: perceptions and maintenance

3.1.1 from "greening" the grey to urban ecosystem services

Kennedy defines urban metabolism as the flows of energy and materials within cities socioeconomic activities and biogeochemical processes [18]. Green infrastructure, defined as the set of techniques that uses vegetation, soils and natural processes to manage urban environment, has shown to be one of the principal components of urban metabolism. In cities, green infrastructure generally refers to those areas that provide flood protection, cleaner air and cleaner water: urban tree canopy, green streets and alleys, green lots and sensitive natural areas such as parks and protected open spaces. However several authors [19-21] have pointed the capacity of green infrastructure to increase property values, neighborhoods integration and wellbeing. Those benefits within an urban metabolism are part of a new study area, introduced by [22] and redefined by the Millennium Ecosystem Assessment (MEA) in 2005 as "ecosystem services". Ecosystem services are all the processes through which natural ecosystems sustain and fulfil human life [22]. Cities properly managed should be able to take advantage of ecosystem services that could provide a social-ecological change towards sustainability [23]. Recent studies have shown that the appropriate way to achieve sustainability relies not only in recovering the ecology within cities but also the ecology outside cities. According to Jansson, most of ecosystem services consumed in cities are generated outside the cities (e.g. food production, carbon storage) and most of the environmental and social ecosystem services interactions occur inside the cities (e.g. population well-being, environmental quality) thus conforming a complex urban metabolism [23].

For analyzing ecosystem services in cities it is important to differentiate "goods" from "services". Ecosystem goods refers to the most common needs from which humans take advantage (e.g. water, air and soil) while "services" are more complex and less tangible benefits afforded by natural and social processes (e.g. runoff mitigation, water treatment and human well-being) [24]. The role that green infrastructure play in reducing urban vulnerability, enhancing quality of life and urban ecology footprint, are all those natural and social processes (redefined by the MEA as "regulating and cultural ecosystem services") [25]. Providing such ecosystem services (equally and decentralized) is what builds redundancy and resilience in cities [26]. In order to explore how ecosystem services and citizen perception and potential in managing them interact in cities Bogotá city was selected as case of study.

3.2.2 Bogotá citizen perception and involvement within the management of urban ecosystem services

Bogotá is the capital city of Colombia with a population of nearly 8 million inhabitants, an urban area of 350 km^2 and therefore one of the densest cities in Latin America. It is characterized by marked

socioeconomic disparities and in the last decades had faced the common consequences of urbanization (e.g. increased floods). Bogotá is considered a representative example of fast growing cities in Latin America and obtained results can contribute towards a better for understanding of the interaction between the urban green landscape structure and socioeconomic aspects. Results from Bogotá have shown that higher mean household income and socioeconomic classification are positively correlated with the amount of green infrastructure, which in turn, are negatively correlated to the population density. As described by Dobbs et al., establishing these linkages is relevant for relating environmental and social inequalities, what at last, evidence the unequal and centralized ecosystem services in cities. As seen in this study, the negative correlation between green areas and population density is a consequence of urban consolidation when planning does not include a sustainable development that maintains the social and environmental benefits in cities [27,28].

Social inequality and centralized distribution of green infrastructure in Bogotá was also observed within the answers of survey respondents. Results showed that respondents from high socioeconomic levels ascribe a highest importance level to green infrastructure when choosing their place of residence (what probably makes them believe that Bogotá complies with the minimum recommended area of green infrastructure per habitant) compared to those respondents from a lower socioeconomic classification. Even though in terms of frequency and types of activities no socioeconomic differences were found. In general terms, Bogotá's citizens prefer practicing exercise and leisure activities in green areas near home (not exceeding five minutes walking), than other type of activities (e.g. cultural or social events). Previous results agrees with Krellenberg et al. [29] and Madureira et al. [30]. In contrast to the results of Madureira et al., who reported that in four different French and Portuguese urban areas, social and cultural benefits are globally more valued than environmental benefits of green infrastructure, in Bogotá the majority of respondents believe environmental issues are the most important (especially runoff mitigation and air pollutant removal).

Grass and gardens were the most common green infrastructure near respondent's homes. "Wellbeing" and "improving environmental quality" were the principal incentives to increasing green infrastructure. In general, they prefer planting gardens (if living in houses) and installing green roofs (if living in apartments). Even though the majority showed very positive attitudes toward increasing green areas, most of those not interested in increasing green areas argue they have "enough amount of green areas" especially those living in houses, meanwhile people living in apartments argue is because "lack of space". Just a 0.9% of the sample said was because of "lack of interest".

It can be concluded that urban citizens are in general motivated to promote community-based initiatives towards increasing decentralized green infrastructures. As an example, there were found several volunteer activities including urban harvesting, reforestation and volunteer tax payments in Bogotá. The "Food and Environmental Plan" from *Un techo para mi país* organization worked in two vulnerable neighborhoods in Bogotá, in 2013 more than 50 volunteers created a communal garden (100 m^2) and installed vertical and horizontal gardens for approximately 20 different families. *Al verde vivo* is a tree adoption program for the recovery of Bogotá´s river, as a result of voluntary donations they have planted more than 80,000 native trees in the upper basin of the river. The Botanical Garden of Bogotá has collected more than 400,000 USD in ten years through *Árbol de vida para Bogotá* program, funded by voluntary contributions of vehicle tax payers for planting and maintaining trees in the public spaces of the city. There are many other examples regarding people managing green infrastructure i.e.

several news about neighborhoods protecting trees, parks and common areas, and recreational and educational activities that involves the use of green infrastructures. Motivated by well-being and environmental benefits, volunteer activities are evidences of the willingness of society to decentralize green infrastructure and benefit from the related ecosystems services. However, these are incipient and emerging community-led initiatives which benefits and impacts on city metabolism, city resilience and behavioral change are still poorly understood and accounted.

3.2 Change agents as user-driven resilience enablers?

In this section two case studies are proposed to emphasize different results of the same method used in order to promote energy saving behavioral patterns. A South African study case has been addressed and compared to a second case in Saudi Arabia. These findings should corroborate the hypothesis that building socially-driven resilience is not only a matter of recognizing and enabling pre-determined strategies but rooted within the cultural values of each society and place.

3.2.1 Positive outcomes from Makana study case

In the case study on the pilot household intervention program in South Africa, we worked with the local Makana Municipality through the Environmental Management Department and 135 households engaged within the study (conducted between March 2014 and August 2014). The first results illustrated the effectiveness of intervention strategies to promote energy savings among poor to middle income urban households. When the data were disaggregated by treatment groups, the findings show that the FT group recorded the most reduction in energy consumption ($p < 0.05$), whereas the reductions in the other two groups (PT and Control groups) were not statistically significant. Although the PT group recorded savings throughout the five months, these savings were found not to be significant. Correlation examinations (for the FT group) between actual reductions and various value (or Quality of Life) factors showed that actual reductions were most correlated (Pearson $r = 0.32$) with the liking for different things in daily life, which suggests that households who could accommodate changes in their lifestyles were likely to engage in energy reduction programs. Correlation were also conducted between current reduction and the feedback given by households in the FT group, and the strongest correlation was found between current energy savings and the perceived level of encouragement given to households by the volunteers (Pearson $r = 0.49$). On the other hand, the lowest correlation was found between actual energy savings and the response to the statement "the information on how to save energy is easy to access so the recommended measures are practiced". In other words, the extent to which households agree that the information provided is easy to access has low correlation with their actual energy savings. When all the intervention strategies were aggregated the results show that the distribution of leaflets and stickers, combined with monthly feedback and discussions (that is, the FT method) was significantly effective in promoting household energy saving. The key aspect in intervention strategies was that a high level of perceived encouragement was provided to the participating households – without which energy reduction was insignificant.

In order for household energy interventions to be successful, technology alone will not be sufficient. Our case study showed that determinants of success include the quality of communication between the households - who are considered the agents of change - and the researchers and government officials.

Further, in order for this method of engagement to be sustainable, it needs to be cost effective and produce significant results to justify the financial investments into the implemented measure. In other words, the triple bottom lines of sustainability must be addressed in order for this to be really successful. Such a community-initiated and driven effort can be viewed as both a sign of (and a way of) cultivating community resilience thanks to its educative (learning) and behavioral (changing) aspects. Our results showed that some degree of behavioral changes can be motivated through the use of the outreach instruments employed in this study. Although we did not study how long this change can last, we believe that having a deeper engagement and cultivating behavioral changes that last longer will contribute substantially to the overall resilience of the community.

3.2.2 Change agents not changing others? Evidences from Saudi Arabia study case

The second study case has been developed in Khobar city (Saudi Arabia) which spanned for six months (September 2014 until February 2015) and involving 88 households (2 treatment groups "TG", leaflet and role model, and 1 control group "CG"). The paired sample test between all the months of intervention found that except for the control group, there was no significant change in electricity consumption in any of the groups in the course of entire study. This indicates an absence of the Hawthorne effect, especially since there was no significant change in the first month, September to October, of the intervention, as was seen in the study conducted by He & Kua [31]. This means that the perception of being observed has no impact on the behavior of the change agents. However, the significant change in the control group occurred between the months of January and February because the season transitioned from winter to spring caused a large enough fluctuation to result in a significant change. This explanation is seconded by the fact that no significant change was observed within the control group throughout the intervention until the month of February. Similar to these, there was no significant change noticed for the control group in any of the two periods, implying that the intervention did not contribute to a significant change in the behaviors of the households and neither did having no intervention contribute to any significant change.

When the test was conducted on the first and last month of the intervention to test whether the intervention had an overall impact on the electricity consumption a significant change in electricity consumption was observed in the control and leaflet group. This was substantiated by their respective p-values (< 0.05). The role model, by contrast, did not reveal any significant change. This seems to suggest that the intervention method involving videos was not as effective as the other two methods. However, there was an aggregate reduction in electricity consumption in all the households between the beginning and end of the intervention, irrespective of the group.

The Wilcoxon signed ranks test demonstrated that there was no significant change in behavior of the households as a result of the intervention. With respect to a few positive changes and no significant changes in any of the responses under question, the results demonstrated that the intervention was ineffective in persuading the households to adopt energy conservation practices. A regression analysis was conducted to test the relationship between the percentage reduction in electricity consumed between the first and last month and socio-demographic variables including, proportion of adults in family, female proportion, family size, building area, and the proportion of family members with a BS degree, which was taken to be an indicator of the educational level of the household. The female proportion and

family size showed a positive correlation with the decreasing energy consumption (r = 0.396 and 0.68 respectively). This warrants the fact that female members are more conscious to save energy while large family size make them realize about large monthly bill which, in turn, enable them to act in saving energy cost. Nonetheless, two of the variables showed a negative correlation with the electricity consumption. These were the proportion of adults in family and the proportion of BS degree implying that with the higher number of adults and the ratio of members with a BS degree, the electricity consumption will also rise (r = -0.475 and -0.532 respectively). This means that the adult and educated family members are accustomed to use various types of appliances and gadgets (e.g., laptop, tab, phones, etc.) throughout the day resulting in higher consumption.

3.2.3. Cross countries comparison in framing energy reduction programs relying on users behavioral change

The South African study provides key insights that have several local, national and regional policy implications with regards to sustainable energy consumption. First, the results point to the need to formalize outreach and energy-saving intervention programmers that are initiated and owned by users. Most importantly, our results suggest that an "encouragement and feedback element" should form the central point of energy-saving programs. These programs should also aim at promoting key energy-saving actions that households are familiar with in an energy-saving language that the households understand. Going forward, the results of this pilot study suggest that an energy-saving intervention programs can yield positive outcomes in a developing country context such as South Africa. However, we are mindful of the fact that some variables did not yield significant results. Hence there is need for further examinations of the effect of various personal values, psychological and contextual factors on energy consumption to give a more conclusive picture. Nevertheless, this study presents a noteworthy case for local and national governments to invest in and support the rolling out of locally-based energy-saving intervention programs. Energy-saving programs in which households act as change agents are desirable because they are relatively cost-effective. However such cost-effectiveness has been working only for one of the two examined study cases. Indeed, from Saudi Arabia the same approach and method used for Makana municipality did not work in Khobar city. Results from this second experience have showed that change agents and being monitored did not serve as an engine promoting behavioral changes. Because within OURS CITIES project we developed different study cases, and recorded other positive experiences applying the same method (Singapore, for example, is a successful case), further investigation is required in order to understand why the same successful practice has not performed well in Saudi Arabia. Which are the cultural factors that enabled a behavioral change in some places, but did not work in others? Is this related to cultural aspect or to socio-economic constrains? Or related to resources availability versus scarcity?

From one side the performed study cases analysis and results do confirm that users-driven resilience can significantly contribute to build learning and adaptation in lifestyles, increasing also community networking. From the other side, the Saudi Arabia study case pointed out and warned that not all the places can react the same positive way to the same socially-driven transition enabler.

4.Conclusion

This paper builds on the normative assumption that civil society can significantly contribute in building urban resilience through community led initiatives and individual actions toward a more sustainable urban future. Case studies form the project OURS CITIES (standing for Operationalizing Users-driven Resilience for Sustainability Transitions in CITIES) were selected and presented in order to explore which are the perceptions and potential contribution of the civil society to urban resilience, and in particular to the promotion and maintenance of urban decentralized green infrastructures, and to the behavioral change for a reduction of energy consumption.

The hypothesis justifying OURS CITIES project and these study cases are that the annual expenditure of local governments around the globe ranges from US$ 2,000−13,000 per person (for the high-income countries) to less than US$ 5 for the lowest-income ones [9]. Such evidence at least supports the research questions about why people should contribute, and how, in building local adaptation to the main urban challenges when local governments are so far in term of resources needed for accomplishing their responsibilities. In these circumstances, when top-down traditional strategies lack the necessary funding for providing and managing urban infrastructures and services, the contributions of users-driven resilience could be key in: enhancing social networking and sharing resources, fostering learning processes and enabling change agents to shape community led initiatives and the behavioral change needed to adapt life styles accordingly to new circumstances.

Before stating rules and performances about user-driven resilience, this paper builds on the need of properly understand which factors, attitudes, perceptions people have in relation to some selected resilience determinants.

The two selected determinants were: the perception and willingness of people to increase and manage urban ecosystem services, and their capacity to change behaviors respect to like style in energy consumptions rates. Results from Bogotá case have shown that green infrastructures related services are perceived as important services (especially runoff mitigation and air pollutant removal) and that urban citizens are in general motivated to promote community-based initiatives towards increasing decentralized green infrastructures. The results from the other two study cases, in relation to energy consumption changing behaviors, lead to different and contradictory outcomes. The first study case in Makana (South Africa) does confirm that users-driven resilience can significantly contribute in building learning and adaptation in lifestyles, increasing also community networking. However, the Saudi Arabia study case pointed out and warned that not all the places can react the same positive way to the same socially-driven transition enabler, since the same methods which produced positive results in the previous case, in Saudi Arabia did not perform any effect nor positive change. This explorative research paper main messages are therefore that, while urban resilience thinking should be oriented though sustainability, i) “resilience determinants” contributing to sustainability transition could be driven also by citizens, and ii) that user-driven contributions to cities resilience should be assessed in term of cultural acceptance and feasibility of the processes before assuming their normativity and positive outcomes.

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Conflict of Interest

The authors declare no conflict of interest.

References and Notes

1. Redman, C.L. Should sustainability and resilience be combined or remain distinct pursuits? *Ecology and Society* 2014, *19*.
2. Cumming, G.S.; Cumming, D.H.M.; Redman, C.L. Scale mismatches in social-ecological systems: Causes, consequences, and solutions. *Ecology and Society* 2006, *11*.
3. United Nations, D.o.E.a.S.A., Population Division *World urbanization prospects: The 2014 revision*; United Nation: 2014.
4. GSP, U. Resilient people, resilient planet: A future worth choosing. New York: United Nations: 2012.
5. Elmqvist, T. Urban resilience thinking. *Solutions* 2014.
6. Matyas, D.; Pelling, M. Positioning resilience for 2015: The role of resistance, incremental adjustment and transformation in disaster risk management policy. *Disasters* 2015, *39*, s1-s18.
7. Chelleri, L.; Waters, J.J.; Olazabal, M.; Minucci, G. Resilience trade-offs: Addressing multiple scales and temporal aspects of urban resilience. *Environment and Urbanization* 2015.
8. Pearson, L.J.; Pearson, C.J. Societal collapse or transformation, and resilience. *Proceedings of the National Academy of Sciences* 2012, *109*, E2030-E2031.
9. Revi, A.; Satterthwaite, D.; Aragón-Durand, F.; Corfee-Morlot, J.; Kiunsi, R.B.R.; Pelling, M.; Roberts, D.; Solecki, W.; Gajjar, S.P.; Sverdlik, A. Towards transformative adaptation in cities: The ipcc's fifth assessment. *Environment and Urbanization* 2014, *26*, 11-28.
10. The Rockefeller Foundation, A. *City resilience framework*; 2014.
11. N., A. Social capital, collective action, and adaptation to climate change. *Econ. Geogr.* 2003, *79*, 387.
12. Cutter, S.L.; Barnes, L.; Berry, M.; Burton, C.; Evans, E.; Tate, E.; Webb, J. A place-based model for understanding community resilience to natural disasters. *Global Environmental Change* 2008, *18*, 598-606.
13. Lucini, B. *Disaster resilience from a sociological perspective: Exploring three italian earthquakes as models for disaster resilience planning*. Springer Science & Business: 2014.
14. Hopkins, R. *The transition handbook: From oil dependency to local resilience*. Chelsea Green Publishing: 2008.
15. He, H.; Kua, H. Lessons for integrated household energy conservation policy from singapore's southwest eco-living program. *Energy Policy* 2013, *55*, 105-116.
16. Kua, H.; Wong, S. Lessons for integrated household energy conservation policies from an intervention study in singapore. *Energy Policy* 2012, *47*, 49-56.

17. Allan, P.; Bryant, M. Resilience as a framework for urbanism and recovery. *Journal of Landscape Architecture* 2011, *6*, 34-45.
18. Kennedy, C.; Cuddihy, J.; Engel-Yan, J. The changing metabolism of cities. *Journal of industrial ecology* 2007, *11*, 43-59.
19. Economics, G.L.A. Valuing greenness-green spaces, house prices and londoners' priorities.'. *London: The Greater London Authority* 2003.
20. Mansor, M.; Said, I.; Mohamad, I. Experiential contacts with green infrastructure's diversity and well-being of urban community. 2010.
21. McPhearson, T.; Kremer, P.; Hamstead, Z.A. Mapping ecosystem services in new york city: Applying a social–ecological approach in urban vacant land. *Ecosystem Services* 2013, *5*, 11-26.
22. Daily, G. *Nature's services: Societal dependence on natural ecosystems*. Island Press: 1997.
23. Jansson, Å. Reaching for a sustainable, resilient urban future using the lens of ecosystem services. *Ecological Economics* 2013, *86*, 285-291.
24. Brown, T.C.; Bergstrom, J.C.; Loomis, J.B. *Ecosystem goods and services--definition, valuation, and provision*. Rocky Mountain Research Station, US Forest Service: 2006.
25. Desouza, K.C.; Flanery, T.H. Designing, planning, and managing resilient cities: A conceptual framework. *Cities* 2013, *35*, 89-99.
26. Pearson, L.; Newton, P.; Roberts, P. *Resilient sustainable cities: A future*. Routledge: 2014.
27. Dobbs, C.; Escobedo, F.J.; Zipperer, W.C. A framework for developing urban forest ecosystem services and goods indicators. *Landsc. Urban Plan.* 2011, *99*, 196-206.
28. Wheeler, S.M. *Planning for sustainability: Creating livable, equitable and ecological communities*. Routledge: 2013.
29. Krellenberg, K.; Welz, J.; Reyes-Päcke, S. Urban green areas and their potential for social interaction–a case study of a socio-economically mixed neighbourhood in santiago de chile. *Habitat International* 2014, *44*, 11-21.
30. Madureira, H.; Nunes, F.; Oliveira, J.V.; Cormier, L.; Madureira, T. Urban residents' beliefs concerning green space benefits in four cities in france and portugal. *Urban Forestry & Urban Greening* 2015, *14*, 56-64.
31. He, H.Z.; Kua, H.W. Lessons for integrated household energy conservation policy from singapore's southwest eco-living program. *Energy Policy* 2013, *55*, 105-116.