

EVALUTION OF “PLANNING THE RESILIENT CITY: CONCEPTS & STRATEGIES FOR COPING WITH CLIMATE CHANGE AND ENVIRONMENTAL RISKS”

1.INTRODUCTION

The main words of this article, which was retrieved on June 4, 2011 by Yosef Jabareen, one of the teachers of the Faculty of Architecture, and titled “Planning the resilient city: Concepts and strategies for coping with the climate change and environmental risk”; urban resilience is climate change, environmental risks and planning. This study, examining the relationship between climate change and resilience with concrete questions, examines the "urban resilience", which is explained by making use of uncertain and confusing terminology, literally and practically. While dealing with the concept of "Urban Resilience", which is a multi-disciplinary concept, in many respects, it also deals with its theoretical and practical sides. It examines what cities should do in stages within the framework of urban resilience and what questions they should look for and answer. According to the article, these stages, which are called as “Resilience City and Planning Framework” (RCPF), are a whole consisting of four interconnected concepts and examining city resilience.

Climate change may create “risks” in cities such as global warming, melting glaciers, acid rains, sea level rise, rainstorms, drought, and heat waves. Nevertheless, solutions that take precautions for factors threatening the existence of urban structures are also sought in this article. It is a very likely result that the world, which has become a “small village” with its rapid globalization, poses these threats and risks by being affected by human actions in a positive or negative way. In response to this result, human communities around the world need to build cities that are resistant to risks and threats and prepared. One of these solutions is ; is to seek answers to comprehensive and solution-oriented questions that aim to minimize the harm that people can bring to their natural and artificial habitats from natural disasters. If we examine the most important of these questions, “How prepared and how durable are contemporary cities and communities to the future threats and risk factors? What should cities do to make a more durable phase from their current situation? How resilient should cities be to contribute to conservation and sustainability? Based on all these questions, this article seeks to answer the this question in practice and in theory: "How can a more resilient future exist?"

The article consists of "problem of resilience" section that explaining the problems that the concept of resilience creates or can create, "In the resilience city" section that briefly describing resilience cities, "methods" section that explaining the methods used when creating the article , "conceptual framework for resilient city and resilient community" section that concepts are explained , "conclusion" section that conclusioning the relationship between resilience and climate change.

2.CRITICAL EVALUATION

2.1.Literature Review

If we search the literature that includes "resilience" focused on climate change and environmental risks; As a method, we see that more numerical data are used in other articles.Despite this, qualitative analysis method was used in this article. dresses conceptual tensions.First, **Elsevier's Scopus** and **Thompson Reuters Web of Science (WoS)** citation databases were used to identify the literature on urban resilience over a 41-year period, beginning in 1973 (when **Holling** wrote his seminal article on resilience) and ending in 2013. Although relatively comprehensive, these databases do not generally include books, and by focusing mainly on English language publications,they have anAnglo-American bias (**Newell & Cousins, 2015**) .Chronologically.According to **Gunderson and Holling (2001)**, resilience is measured by the extent of discomfort and problems that can still persist in conditions within the existing conditions Accordingly,**Godschalk (2003)** has discussed the dynamic and multiple development paths of resilience, successive stages of gradual change, complex systems that can be characterized temporally and spatially between individual dynamics, suggest that you should build the purpose of resilience city in a multidisciplinary way.**Richard Little (2004)** suggests that Resilience is much more than just physical meaning and will have less impact when viewed from a narrower angle. **Folke and Picket (2006)** argue that the theory of resilience provides insights into complex socio-ecological systems and their sustainable management,theoretically,especially with respect to climate change.The concept of resilience is a phenomenon that includes many concepts. Henstra (2012) states that a climate-resistant city has the capacity to withstand climate change stresses, respond effectively to climate hazards, and quickly get rid of residual negative effects. **Bettencourt and Geoffrey (2010)** stated that some scientists claim that some critical urban problems generally lead to bad results. According to some researchers, Resilience is a quantifiable phenomenon. In this article, the gap in the literature within the scope of "Resilience" is "how to measure flexibility and how to measure the urban resilience resistance of a system. In his article, **Castello (2011)** discussed the need to improve socio-ecological conditions in rural areas exposed to natural disasters and rural communities in developing countries; he looked at social structure and ordinary communities.This statement can be seen as a kind of "treatment".

An example of these treatments is the Universal Campaign's United Nations International Disaster Mitigation Strategy, making the cities more resilient, according to **UNISDER,(2010)**.The campaign aims to reduce disaster risk, increase the welfare and safety of citizens, make a good investment for tomorrow, and aims for sustainable development. The campaign deals with local governments and other institutions as well as civil society in the analysis of stakeholders. In this context, based on the research done by **Newman and Beatley (2009)**; We can give an example of the oil crisis as a dimension of resistance in the cities evaluated. It threatens the existence of other sources. All these efforts are an effort to become a resilient city.

"Resilient city ..?" If we examine the question in the literature, **Vale and Campenalla (2005)** attribute understanding of urban resilience and urban restructuring to the human factor. In other words, this article aims to provide a more rigorous and careful basis for promoting and evaluating the resilience of cities. When the conceptual framework for resilient city and resilience community is examined, the analysis developed within the method reveals a conceptual framework consisting of four interrelated main concepts and components: Vulnerability analysis matrix, Urban governance, Prevention ve Uncertainty-oriented planning.

A. Vulnerability analysis matrix

In **High-Rise Security and Fire Life Safety (Third Edition) book (2009)** Vulnerability analysis matrix; It mentions that there is a detailed analysis of building functions, systems and site features to identify mitigation measures or corrective actions that can be designed or implemented to identify building weaknesses and oversupply. In this article, this concept includes spatial and socio-economic mapping of the resistant city and future risks. It analyzes and defines the types, demographics, intensity, coverage and spatial distribution of environmental risk, natural disasters and future uncertainties in cities. In addition, vulnerability in the context of climate change shows how unprepared the current conditions are. Uncertainty, Informality, Demography and Spatiality are sub-components of this concept.

Demography of vulnerability : According to **Blaikie, Cannon, Davis & Wisner (1994)** and **Ojerio, Moseley, Lynn & Bania (2011)**; This component examines the demographic, socio-economic aspects of the urban vulnerability. It affects the reaction and recovery process of the risk caused by natural disasters, the ability to cope with the risk. **Hamm (2008)** adds, Demographic change will have an impact especially on economic growth, labor and capital market, housing, fiscal policy, retirement and health services. Socio-economically weak communities are more vulnerable and unprepared for exposure to negative outcomes such as property loss, physical and psychological damage.

Informality : According to article of **Roy (2010)**; This component assesses the scale, social, economic, and environmental conditions of unregistered urban areas, resulting in unofficial areas that are unplanned and irregular. Unofficial places where the low income population lives; They are unprepared and vulnerable to any risk due to lack of service and infrastructure.

Uncertainty : **Abbott (2009)** mentioned this component is “a major deficiency of a purpose or action carried out by a group or individual”. While vulnerability assessments are made incomplete in the presence of uncertainty, they are made as complete and sufficient as possible, if uncertain. It is very important to be “specific” in the assessment of environmental risks and hazards.

Spatiality : It shows the spatial distribution of communities with risks, uncertainties and vulnerabilities in the city. For example, environmental risks are not always dispersed homogeneously, they affect some communities more. **Satterthwaite (2008)** emphasizes that the most vulnerable to climate change impacts are those at high risk. In another article in the literature, **Birkmann and Christmann (2008)** emphasized that an integrated spatial approach to urban resilience or resilient cities is still lacking.

B. Urban governance

This component deals with the management of urban resilience. It focuses on the management process and roles. It assumes that this process is comprehensive in more durable cities. While there is participatory planning in strong governance, there is no participatory planning in weak governance. **Bulkeley (2010)** mentions that cities play a key role in the management of climate change. According to **Healey, (2007)** urban governance mentioned here is related to the spatial organization of urban areas, environmental and economic comfort. And again adds **Healey & Upton (2010)**; Urban risks occurring in today's metropolitan cities disrupt the proper management process. In addition, **Satterthwaite (2008)** emphasized the local governments have a critical role in reducing climate change. The concept consists of three components: Integrative approach, equity and ecological approach.

Integrative approach : According to **Allman Fleming & Wallace (2004)** this component develops a method in urban management by increasing knowledge and establishing new institutions to deal with the risks and threats of climate change. Stakeholders should develop urban policies and plans aimed at resisting climate change. And according to **Mrfenderesk & Corkill (2009)** these plans should be flexible enough to adapt quickly to the rapidly changing environment.

Equity : **Davies, Guenther, Leavy, Mitchell, Tanner (2008)** emphasized, this component deals with social issues such as inequality, spatial injustice, poverty and public participation in space production. According to **UNISDR, (2010)** a more resilient city is the city with less social inequality and more resilience distribution of sources of resilience. More social equality, fairer education and health systems can be added to this. **Adger (2001)** points out that social and spatial differentiation of climate change mitigation policies is a local and international issue.

Ecological economics : According to **David (2006) and Mercer Human Resources Consultancy (2004)** this component examines the economic aspects of urban resilience and climate change goals. To **UNEP(2009)** accordingly, investments in renewable energy and energy efficiency have increased in the global public and private sector. It is necessary to relate urban resilience to cities with green technologies and environmentally friendly investments.

C.Prevention

This concept advocates that cities should try to avoid environmental hazards and climate change impacts to move towards greater urban resilience and less vulnerability. Its components are mitigation, restructuring, applying alternative energy.

Mitigation : According to **CCC- Climate Change Committee (2009)**, this component includes practices, policies and actions aimed at reducing the impact of risk factors such as greenhouse gases.

Restructuring : This component creates the resilience of a city to reconstruct itself to deal with social, economic and environmental problems. For example, from the researches of **Cooke and Piccaluga (2006)**, it is clear that the knowledge-based economy affects the spatial distribution in the city.

Applying alternative energy : **Yumkella (2009)** defined this component as a descriptive time problem. According to **CCC-Climate Change Committee (2010)**, more “resilient cities”; it is a city where cleaner, more efficient and renewable energy use is more effective. It promotes the use of renewable energy sources.

D. Uncertainty-oriented planning

It argues that planning should be with the role that creates the result of uncertainty rather than traditional planning approaches. **Abbott (2005)** defined this created “role” as “controlling uncertainty, either by securing the future now or by preparing actions to be taken in the event of an event”. The concept of uncertainty consists of three interrelated components: spatial planning, sustainable urban form.

Adaptation : This component advocates an important need for uncertainty management that includes adaptation policies to counter climate change. According to **Wardekker & de Jong, Knoop (2010)**, the resilient approach to adaptation to climate change should address uncertainties and limit impacts even if size and direction are uncertain or unknown. **Walker (2003)** emphasizes that adaptation planning should also take into account statistical uncertainties, scenario uncertainty, or sometimes recognize ignorance.

Spatial Planning : This component assesses the role of planning in transforming the city into a more resilience state. **Gunder & Hillier (2009)** mentioned, “To provide 'future' certainty 'in a complex, unstable, dynamic and inherently uncertain world”.

Sustainable Urban Form : According to **Banerjee and Loukaitou-Sideris (2010); MacKillop (2012); Meijer, van der Adriaens, Linden and Schik (2011)**, for urban resilience; If the previous component of spatial planning focuses on macro-urban dimensions, this concept focuses on the micro level and deals with the 'good city form' that has an impact on the urban design and urban form's attributes or. Urban design must be examined in many ways: multiculturalism, urban health, environmental justice, economic development, climate change, energy conservation, protection of the natural environment, sustainable development and the livability of society ...It consists of; Sustainable transport, Density, Mixed land uses, Diversity, Passive solar design, Greening. **Cervero (1998) and Clercq & Bertolini (2003) advocated** reduced time in traffic, promoting vehicle-free travel and equal access for *sustainable transportation*. According to the opinions in other articles in the literature; **Carl (2000), Walker & Rees, (1997); Newman and Kenworthy (1989)** on *density*; They argued that significant energy savings can be achieved through high-density planning. **Parker (1994), Alberti (2000), Van & Senior (2000), Thorne and Filmer Sankey (2003)** have argued that interrelated activities are spatially related to *mixed land uses*. **Turner & Murray (2001)** on *variety*; they advocated non-monotonous things that support a wide range of urban features such as housing types, building densities, house sizes, ages, cultures. **Wheeler (2002)** leads to homogeneous settled forms and increased discrimination of monotony, car travel, congestion and air pollution. **Owens (1992), Thomas (2003), Yanns (1998)** suggested that settlement, landscape and building design, which aim to reduce energy demands, affect *passive energy* to make the most of it. On the *greening* described as "bringing nature to the city", **Beatley (2000); Swanwick, Nigel and Helen (2003)** argue that cultural and social formations are closely related to green.

2.2.Methods

Jabareen (2009) explained in this article that a qualitative analysis method based on "the production, definition and monitoring of the main concepts" is used to create the Conceptual framework. According to this analysis method, each concept has its own qualitative features, limitations, assumptions, functions and different perspectives. In addition, to **Deleuze & Guattari (1991)** every concept defined by the qualitative analysis method has components, they are not just a case. In the method of this article, the following steps were followed in the creation of a "conceptual framework":

1. mapping multidisciplinary data sources,
2. reviewing the literature and classifying the selected data,
3. defining and naming concepts;
4. deconstructing and categorizing the concepts,
5. integrating concepts,
6. synthesizing, re-synthesizing and making everything meaningful; and
7. approving the conceptual framework.

All these stages used in the qualitative analysis method in which the conceptual framework is created include literature review and classification, which addresses the urban, environmental, social and economic aspects of resilience. The contribution of each concept to urban resilience can be measured qualitatively and quantitatively according to the measurability of its components. In short, in this article, the qualitative analysis management used when examining the link between urban resilience and climate change; With this method, many concepts and components have formed a resilience urban planning framework.

If we examine why this method is used, the relation between climate change and resilience, which is a conceptual phenomenon, was aimed to be examined using a method based on features and explanations. In other words, although demographic and economic numerical features are added to the method that develops especially in the light of demographic, social and cultural values, it is found to be more appropriate to qualitatively evaluate, because the method consists of a more social perspective. Briefly, by using this method, understanding the concepts and components, "How should a more resilience city be?" can be answered.

2.3.Results

As a result, the main area in the discussion discussion; it is shaped around the concepts of urban flexibility, climate change, environmental risks and planning. This area; It aims to explain the relationship between climate change and urban resilience with reference to the "resilient city planning framework", away from ambiguous and complex terminology. While the author was creating this article around two main topics, he benefited from the views about "urban resilience" of other authors articles and books since 1973 and based on his own views, which he created in line with the qualitative method. The article is not strictly biased, it is very understandable, balanced and organized as it filters the concepts of resilience-climate change and the concepts related to this subject from past to present. It also includes other literatures. In fact, in my view, only theoretically the concepts related to city resilience in the framework of durable city planning are described as a small deficiency, because, although understandable and clear, it has a task that can only remain as an "analysis" on paper, it has not been put into practice in this article. In other literatures, scattered and complex terminology articles are described here around the "framework", which is regularly and comprehensively developed here.

If we summarize the critical questions that develop around this framework (RCPF-Resilient City Planning Frame) and form the article;

Table 1
Resilient city framework.

Concepts	Components	Key questions (measurements)
Concept 1: Urban vulnerability matrix analysis	C1: Uncertainties	C1. What are the hazard and environmental uncertainties?
	C2: Informality	C2. What is the scope, geography, socio-economic, demographic, and physical characters of existing informal settlements in or closed to the city?
	C3: Demography	C3. What is the nature of vulnerable demography in the city by age, gender, health, and other social group?
	C4: Spatiality	C4. What is the spatial distribution of environmental hazards and risks?
Concept 2: Uncertainty oriented planning	C1: Adaptation	C1: What adaptation measures are taken to reduce risks and cope with future uncertainties?
	C2: Planning	C2: How do planning methods cope with uncertainties?
	C3: Sustainable form	C3: What are characteristics of the existing and planned urban form typologies?
Concept 3: Urban governance	C1: Equity	C1: Who participates in decision-making and planning regarding environmental and uncertainty issues?
	C2: Integrative	C2: Is the urban governance approach integrating institutional, legal, social, economic, and environmental aspects?
	C3: Eco-economics	C3: what is the nature of the existing and planned ecological economy?
Concept 4: Prevention	C1: Mitigation	C1: What mitigation measures are taken to reduce risks and to prepare the city for future environmental hazards?
	C2: Restructuring	C2: What are the proposed or planned spatial, physical, and economic restructuring policies that aim to face the environmental hazards and uncertainties?
	C3: Alternative energy	C3: How does the city address the energy sector and whether it proposes strategies to reduce energy consumption and to use new alternative and cleaner energy sources?

Table 1. RCPF-Resilient City Planning Frame

To summarize the main comment made in one sentence, the author, for build a "more resilient" city, together with governments, public and private organizations, civil society stakeholders, Advocates that a sustainable, transparent and fair understanding should be developed through matrix analysis of urban vulnerability to prevent urban natural disasters and risks.

3. Conclusion

To summarize the article briefly; This article has prepared a new conceptual framework (Resilience City Planning Framework; RCPF) that addresses critical questions about what cities and urban communities should do to create a "more resilient" city in the future. This planning framework provides a comprehensive understanding of city resilience. It is defined as a theoretical plane of network or interconnected concepts. The Resilience City Planning Framework consists of four concepts, each of which contributes to the urban Resilient framework, the sum of the contributions of its measurable components. While several measurement techniques are available for some of these components, not all components have a measurement technique. A systematic approach should be applied to missing components. Each of the four Resilience City Framework concepts has specific roles in the RCPF framework. 'Urban vulnerability matrix analysis' puts roles in the flexible city's governance process and culture. These concepts are critical and very important for the flexible city, as it contributes to the spatial, socio-economic mapping of future risks and vulnerabilities.

While the concept of "urban governance" creates a need for a new approach to deal with urban policies and uncertainties and climate change challenges; it contributes to the holistic management of urban resilience. These components include urban restructuring with the mitigation of the effects of natural disasters and risks and adaptation of new sustainable conditions. It also developed a method for cities to deal with uncertainty with "uncertainty-oriented planning".

In summary, in the article, the author argues that a sustainable, transparent, fair understanding should be developed with the RCPF (Resilience City Planning Framework) to build a "resilience" city and to reduce natural disasters and risks with governments, public and private organizations, civil society stakeholders.

4. References

- Abbott, J. (2009). Planning for complex metropolitan regions: A better future or a more certain one? *Journal of Planning Education and Research*, 28, 503–517.
- Adger, W. N. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development*, 13(7), 921–931
- Beatley, T. (2000). *Green urbanism: Learning from European cities*. Washington, DC: Island Press.
- Biermann, F., & Pattberg, P. (2008). Global environmental governance: Taking stock, moving forward. *Annual Review of Environment and Resources*, 33, 277–294.
- Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). *At risk: Natural hazards, people's vulnerability, and disasters*, Routledge, London
- Bulkeley, H., & Newell, P. (2010). *Governing climate change*. London: Routledge.
- Bulkeley, H. (2010). Cities and the governing of climate change. *Annual Review of Environment and Resources*, 35, 229–253.
- Castello, M. G. (2011). Brazilian policies on climate change: The missing link to cities. *Cities*, 28(6), 498–504.
- Cervero, R. (1998). *The transit metropolis: A global inquiry*. Washington, DC: Island Press.
- CCC: Committee on Climate Change. (2010). *Building a low-carbon economy – the UK's innovation challenge*. <<http://www.theccc.org.uk>>.
- CCC-Committee on Climate Change Adaptation. (2010). *How well prepared is the UK for climate change?* www.theccc.org.uk.
- Cooke, P., & Piccaluga, A. (Eds.). (2006). *Regional development in the knowledge economy*. NY: Routledge.
- Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, 16, 253–267.
- Folke, C., Carpenter, S. R., Walker, B. H., Scheffer, M., Chapin, F. S., III, & Rockstro, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, 15, 20. <<http://www.ecologyandsociety.org/vol15/iss4/art20/>>.
- Folke, C., Jansson, Å., Rockström, J., Olsson, P., Carpenter, S. R., Chapin, F. S., Crépin, A.S., et al. (2011). Reconnecting to the biosphere. *AMBIO: A Journal of the Human Environment*, 40(7), 719–738.
- Godschalk, D. R. (2003). Urban hazards mitigation: Creating resilient cities. *Natural Hazards Review*, 4(3), 136–143.
- Godschalk, D. R., Beatly, T., Berke, P., Brower, D. J., & Kaiser, E. J. (1999). *Natural hazard mitigation: Recasting disaster policy and planning*. Washington, DC: Island Press
- Greinke, L., & Levin Keitel, M., & Othengrafen, F. (2018). *Resilience, Climate Change and Adaptation*.

- Healey, P., & Upton, R. (Eds.). (2010). *Crossing borders international exchange and planning practices*. Oxon: Routledge.
- Jabareen, Y. (2006). Sustainable urban forms: Their typologies, models, and concepts. *Journal of Planning Education and Research*, 26, 38–52.
- Jabareen, Y. (2009). Building conceptual framework: Philosophy, definitions and procedure. *International Journal of Qualitative Methods*, 8(4), 49–62.
- Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and Urban Planning*, 147, 38–49. <https://doi.org/10.1016/j.landurbplan.2015.11.011>.
- Munn-Venn, T., & Archibald, A. (2007). A resilient Canada: Governance for national security and public safety. *Governance for National Security and Public Safety*. <<http://www.conferenceboard.ca>>.
- Ojerio, R., Moseley, C., Lynn, K., & Bania, N. (2011). Limited Involvement of Socially Vulnerable Populations in Federal Programs to Mitigate Wildfire Risk in Arizona. *Natural Hazards Review*, 12(2), 28–36.
- Porter, T. & Gough, M. (2007), “Active Security Monitoring”, How to Cheat at VoIP Security.
- Roy, A. (2010). Informality and the politics of planning. In J. Hillier & P. Healey (Eds.), *Planning theory: Conceptual challenges for spatial planning* (pp. 87–107). Ashgate Publishing.
- Satterthwaite, D. (2008). Climate change and urbanization: Effects and implications for urban governance. In Presented at UN expert group meet. popul. distrib., urban., intern. migr. dev. UN/POP/EGMURB/2008/16
- Turner, S. R. S., & Murray, M. S. (2001). Managing growth in a climate of urban diversity: South Florida’s Eastward ho! Initiative. *Journal of Planning Education and Research*, 20, 308–328.
- UNEP-United Nations Environment Programme/ New Economy Finance, *Global Trends in Sustainable Energy Investment*. (2009). Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency
- UNISDR-International Strategy for Disaster Reduction (2010). *Making cities resilient: My city is getting ready, 2010–2011*. World Disaster Reduction Campaign.
- Van, U.-P., & Senior, M. (2000). The contribution of mixed land uses to sustainable travel in cities. In K. Williams, E. Burton, & M. Jenks (Eds.), *Achieving sustainable urban form* (pp. 139–148). London: E & FN Spon
- Yannas, S. (1998). Living with the city: Urban design and environmental sustainability. In M. Eduardo, & S. Yannas (Eds.), *Environmentally friendly cities* (pp. 41–48). London: James & James.
- Yumkella, K. K. (2009). Forward. In *energy and climate change: Greening the industrial agenda*. UNIDO-United Nations Industrial Development Organization (2010.P.1). <<http://www.unido.org>>.