

Promotion of Urban Resilience with Citizens' Local Participation Approach Case Study: Bonab City

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ABSTRACT

Nowadays, many hazards threaten urban life seriously. Urban resilience is very significant to encounter these risks. Urban resilience development has some basic prerequisites such as broad participation of citizens. The purpose of this paper is to review the role of citizens' participation in urban resilience improvement. This is an applied descriptive-analytic research. Also the type of research is correlational-causal. Subjects are the residents living in 13 of urban districts of Bonab in Iran. Using simple random sampling method and Cochran formula the sample size obtained is 400. Also, Pearson correlation test and stepwise multivariate regression test are accomplished. Face validity of the questionnaire was conformed by university professors. By making use of Cronbach's alpha special formula the reliability of research questionnaire obtained is 0.901 for participation questionnaire and 0.896 for urban resiliency questionnaire. The results of Pearson's test show that the majority of participation variables are correlated with variables of urban resiliency. Also, results of multivariate regression illustrated that physical participation instrumentation variable is more powerful to explain variations of urban resiliency and educational-promotional, political-administrative, and intellectual-financial variables, respectively, are the remaining variables. These five variables are capable of explaining 0.87 percent of urban resiliency variations. Finally, practical suggestions on urban resiliency improvement through citizens' participation invitation are provided.

Keywords: Urban Resilience, Citizen Participation, Risks, Crisis Management, Bonab.

INTRODUCTION

Massive growth of cities and centralization of facilities and services in city centers has made two-thirds of the global population to live in urban environments. Widespread aggregations of population in downtowns have created many socioeconomic, political, environmental, and especially physical problems in urban areas (Miao, 2011).

Moreover, broad influx of poor population and almost refugees to the cities have made urban environments fragile and vulnerable against various natural-hazards and man-made hazards (Kohlhase, 2013).

Issues and problems of new-fashioned cities are so extensive and deep that governments have not enough financial and technical resources and capabilities to eliminate them (Miao, 2011). Governments' inability to eliminate urban issues and vulnerability of urban areas, specially in the third world, has induced proposition of different issues and models in urban management domain (Breuste, 2013). The ineffectiveness of models and theories on urban management is entitled top-down management approaches, which developed new urban management theories that mostly rely on citizens' participation in decision making processes, and today they are called top-down management (Breuste, 2013).

The urban management approach is the newest theory in urban management. Positive and productive results of the approach made it the most important approach in urban management in all developed countries (Beatley, 2012). Reduction of the cost of urban development plans, promotion of citizens' social capacity and their capacity building, promotion of the success factor of plans and projects, construction violation prevention, providing necessary welfare conditions for citizens, and implementation of principles of democracy are the successful experiences of the countries due to adoption of participatory approach in urban management system. Indeed, participatory approaches motivate citizens' real participation in decision making of urban authorities to apply their viewpoints to promote their socio-

political capabilities; thus, real participation in urban management means mutual relation of people with urban management so that they could affect positively and helpfully (Portney & Berry, 2010).

Arnersterins believe that effective participation enables citizens to participate in decision making to promote planning results in accordance with their collective needs for final promotion of their socio-political capabilities (Arnersterins, 2006). Also, Abbott believes that, in participatory urban management, citizens must be capable enough of identifying themselves and try to utilize their individual and collective thoughts to cope with urban issues and problems.

Also, Eizenberg observed that citizens' participation in urban development planning process depends on their knowledge on urban districts, because they may recognize damage and challenges of their habitat, and their participation is considered a very powerful tool to eliminate these issues. They recognize probable issues and they will reduce vulnerability factor in the future (Eizenberg, 2012). Moreover, Evans and Campos observed that importance of citizens' participation can be perceived when there is a correlation with their participation, individual strength and also the community is not anticipated to know how to face threats and risks. They observe that citizens and authorities can anticipate costs and benefits to reduce costs of accidents. In other words, citizens' participation helps them distribute pressure of risks among people and civic groups (Evans & Campos, 2013).

Scientists of different disciplines observed that participation approach adoption of district-based management in cities is highly capable of reducing concerning damage of natural and man-made risks known as urban resilience. Accordingly, Hartz and Meister (2011) believe that citizens' pre-accident participation is the most helpful measure to protect cities against risks.

In this regard, they have approached the authorities and planners about the fact that it is a necessity to build resilient cities and to retrofit them; citizens must know risks; their general awareness must be improved through training (Hartz and Meister, 2011); therefore, urban resilience includes planning and urban management by minimizing man fatality and imposed economic losses, to protect and support continuing livelihood, citizens' life and health (Stumpp, 2013).

Ahern observed that urban resilience includes recognition of influence manner of socio-economic, institutional, political, and executive capacities of urban communities against every eventual risks that is formed through citizens' public participation. He observed that urban resilience includes four dimensions, named economic, social, environmental, and physical, as well as institutional-structural (Ahern, 2011).

In relation to significance of participation in urban resilience, Norris et al. observed that citizens' social capacities through public participation are basically very important for urban resilience as a modern heritage of urban management (Norris, 2008). Also, Müller defined urban resilience as resistance against natural disasters. He observed that urban resilience makes it resistant against natural and man-made disasters without destructive losses and damage, without losing production power or quality of life. Citizens of a resilient city have public perception mean while they try to promote resilience level of their community through social participation and promotion of capacities and capabilities for public benefit (Müller, 2011).

Also, Stevens et al. observed that there are many effective factors on citizens' participation in urban resilience including citizens' social capacities and capabilities, horizontal relations, income, education, occupation, and social justice (Stevens et al., 2010). Kaplan observed that urban resilience is peoples' capacity to confront hard conditions and their flexible response to imposed pressures on themselves and fellows (Kaplan, 2005). Moreover, some scientists named Tanner and Jabareen observed that urban resilience has stable and complex networks of physical and man-made systems. These systemic networks are urban components and constructive elements that give identity to the city (Jabareen, 2013; Tanner, 2009).

Ernstson et al. discovered the role of social capital, knowledge, awareness, and skill in promotion of urban resilience; they have mentioned these variables on citizens' participation in urban resilience (Ernstson, 2010). Keck and Sakdapolrak focused on role of effective elements of citizens' participation in development of resilient city, access, ownership, institutional relations, institutional performance, and institutional platform. Generally, we can conclude that adoption approach of participatory management on urban resilience utilizes citizens' potential social capacities to reduce life and financial casualties during accident. Accident-prone is an inseparable feature of the most lands in Iran and East Azerbaijan province as well as Bonab county; thus Moradi (2011) studied surrounding faults of Azerbaijan and he concluded that all rural and urban settlements of the region including the Bonab county are exposed to enormous and average earthquakes caused by such faults as the fault in north Tabriz, the fault of Astara, the fault of Urmia, and the fault of Mahabad (Moradi, 2011).

If we add other natural disasters such as flooding, Lake Urmia drying, hail, glacial and worn-out urban districts, and active polluting industries, the importance of urban resilience and citizens' comprehensive participation will be revealed more than ever. Thus, by focusing on significance and constructive concepts of urban resilience and citizens' participation in promotion of urban resilience, this paper is going to respond to some basic questions to recognize that there exists a relation between citizens' participation and the rate of urban resilience. In order to respond to the main research question, following sub-questions will be answered too:

- How social variables affect the rate of citizens' participation and promotion of urban resilience?
- How economic variables affect the rate of citizens' participation and promotion of urban resilience?
- How cultural variables affect the rate of citizens' participation and promotion of urban resilience?
- How political-institutional variables affect the rate of citizens' participation and promotion of urban resilience?
- How psychological variables affect the rate of citizens' participation and promotion of urban resilience?
- What solutions are recommended for participation of majority of citizens in urban resilience?

THE THEORETICAL FRAMEWORK

The evolution and implementation of the concept of resilience show that there are different interpretations. In terms of linguistics, resilience refers to the ability of a substance or object to spring back into shape under the influence of external force (Manyena, 2006).

Resilience was first introduced as a descriptive ecological term (Holling, 1973), and then it has been defined in psychology domain (Richardson, 2002).

Specially in 1980, engineers and scientists of basic sciences have focused on the importance of resilience in crises and disasters; in urban management, urban resilience is defined as the "capability to prepare for, respond to, and recover from both the impacts of acute disasters and the slow, creeping effects of the changing climate, all making resilience planning critically important" (Godschalk, 2003; Jabareen, 2013).

According to the urban managers, urban resilience is the "capacity to prepare for, respond to, and recover from both the impacts of acute disasters and unwanted effects of the changing climate." Indeed disaster risk reduction and adaptability to the environment changes and recovery are recommended to the urban communities (Serre et al., 2012).

Resilience is important for the definitions of its different functions. The last definition of urban crises management pertains to the National Academy of Sciences of the United States of America (2011). Accordingly, vulnerability depends on the rate of something or someone exposed to risk and delicacy of a system-scale of damaged people and places (Wu, 2013).

Another definition of urban resilience is the citizens' ability and their successful adaptability to the challenges and threats to the individual and collective life as well as those of biotic and abiotic elements (Ayyub, 2014). Fleischhauer, 2008, and Lightsey, 2006, observed that resilience is individuals' positive adaptation and positive responses to the adverse conditions, damage, and threats. Also, Keck and Sakdapolark, 2013, observed that resilience is successful and conformable confrontation to the challenging threats of individual and collective life. Leichenko, 2011, observed that resilience is individuals' capacity for active and productive participation in surrounding environment.

Rutter (2000) believed that resilience is one's ability to bounce back from a negative experience with "competent functioning" in threatening conditions, consequently entailing successful adaptation of living citizens.

Incidents and hazards bibliography has clearly defined features of resilience systems. For instance, disaster reduction committee has mentioned characteristics of resilient communities as follows:

- They identify and comprehend concerning risks appropriately.
- They know when danger is imminent.
- They are safe from the risk.
- They have minimum life and economic disturbance or disorder after accidents or disasters.
- All involved people and organizations know their duties and they perform their tasks well if necessary (Hollnagel, 2007).

According to the above definitions, resilient city is capable of tolerating intensive natural disasters and incidents without loss of quality of life of residents or loss of productivity due to the devastating casualties (Jabareen, 2013).

Nowadays, disaster risk management has highly increased fortunes of urban resilience due to the coordinated actions of different executive sectors, qualified and experienced urban managers as well as informed citizens. Doctrines of these actions are defined based on the framework of Hugo treaty signed by 168 member states by focusing on urban resilience too.

Based on the framework of the mentioned treaty, urban incident resilience includes the following elements:

- Community resilience is a measure of the sustained ability of a community to utilize available resources to respond to, withstand, and recover from adverse situations. It refers to demographic situation of a community including age, gender, ethnicity, race, socio-economic, and social capital. Although measurement of social capital and resilience realization planning is hard and complex but common participation of citizens and urban planners, sense of place, and compatibility are components of resilience. Indeed, the scope of resilience includes development of social capacity to encounter critical situation through incident elimination for realization of community based crisis management.

- Infrastructure-structural resilience is the ability to reduce the magnitude and/or duration of disruptive events. The effectiveness of a resilient infrastructure or enterprise depends upon its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, as well as robustness, redundancy, and recovery. A structure's ability to absorb disastrous impacts with timely returns to normalcy. It includes buildings, citizens' assets, transportation systems, and communication networks, facilities, health & therapeutic infrastructures, degree of vulnerability of roads and streets, and critical lifelines for emergency evacuation.

- Economic resilience adopted in this paper is the "nurtured" ability of an economy to recover from or adjust to the effects of adverse shocks to which it may be inherently exposed. The scope of economic resilience includes different indices, named occupation, business, post-crisis capability of different economic sectors for continuance of concerning activities to business, and revenue to meet the needs and requirements of the affected community.

Managerial-institutional resilience: It refers to all public and private systems who manage urban communities. In fact performance of all institutions is effectively definable in accordance with time-level of crisis management. Private sector, social society organizations, different national, and regional and local public sectors are involved in resilience management

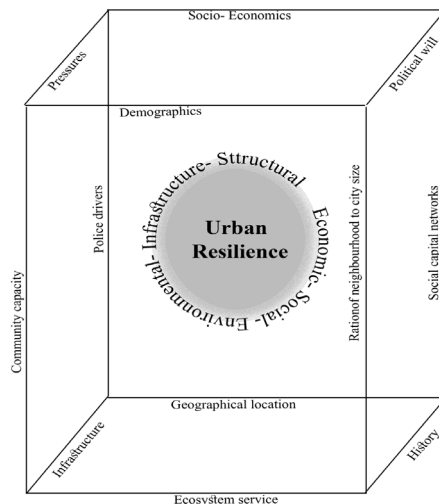


Figure 1. Factors affecting urban resilience (Collier et al., 2013).

Also, they define new approaches of crisis management and recommend transition process of vulnerability to resilience; accordingly the first approach focuses on leadership and coordination of different sectors and components including common participation of citizens, civic groups, and mobilization of different public sectors at national, regional, and local levels. But the second approach focuses on urban planning and strategies of urban development (Robert and Lajtha, 2002).

To improve resilience against incidents, urban managers must have definite landscapes and strategies for all times; they must develop and update concerning standards, rules, and regulations based on past and current backgrounds and present facilities, and they have to upgrade their plans for future incidents (Bonanno et al., 2006).

Therefore, time is a key element affecting quality of resilience; the concept is defined in three different forms: Futuristic resilience that emphasizes development of potential capacities needed to manage future disasters; concurrent resilience that emphasizes citizens' concurrent skills to encounter incidents; retrospective resilience that focuses on post-disaster improvement and recovery (Bonanno, 2004; Smokowski et al., 2000). The two approaches and the three operational forms emphasize management components. Influential factors on quality of urban resilience are reflective and persuasive, strength and durability, flexibility, resource-based, holistic, integrated, active participation, and nativism (Klein et al., 2003). Moreover, a number influential factors on urban resilience are presented in table 1.

Table 1. Influential factors on urban resilience.

Dimensions, Components or attitudes	Reference
General systems: structural, operational, time study; socioeconomic and environmental	Foster (1997)
Construction standards, development regulation; concerning policies to critical public spaces; Land acquisition; information release	Olshansky & Kartez (1998)
People, social institutions; resources; local governance; public participation	Center for community enterprise (2000)
Personal characteristics (Health, Income, Gender, Skill and so on) condition of infrastructure, socioeconomic trends	Emergency Management Australia (EMA) (2001)
Surplus, diversity, adequacy, autonomy, cooperation, consultation	Godschalk (2003)
Technical, organizational, socioeconomic	Bruneau et al. (2003)
Community Risk management process of community, Public choice, understanding, assessment of common risk, public planning for management, development of risk management and basic training, evaluation and monitoring of participatory management	Asian disaster preparedness center (2004)
Cultural attitudes, systematic approach to the risks, capacity building and empowerment of the public, citizens' public cooperation	Henestra et al. (2004)
Government networks, dynamism and social solidarity	CSIRO (2007)
Experiences of Citizens and managers, common values, common sense of place, local risk management and risk comprehension, citizens' liability	NOAA (2007)
Social capital, economic capital, human capital, physical capital and natural capital	Mayunga (2007)
Social vulnerability, built environment and infrastructures, confrontation to the natural systems, mutual relationship of the systems	Cutter et al. (2008a)
Ecological, institutional, social, economic, infrastructural, qualification of the community	Cutter et al. (2008b)
Degree of economic development, amount of social capital, institutionalization of public participation, supporting systems of public participation, sense of place, communication and information, targeted civilians, civilians' leadership and their role-playing, institutional coordination with citizens	Norris (2008)
Ecological, economic, infrastructural, social, government, people	Longstaff et al. (2010)
Income, available resources, planning, population, standards and safety, training, skill, recognition of risk, citizens' involvement and their role-playing	Normandin et al. (2011)

Scientists and theoreticians observed that entry to resilience topic in urban management is the development of a new culture. Concerning the importance and necessity of the term resilience, some scholars refer to the urban resilience and disaster risk management as a new pattern of management evolution (McEntire et al., 2002).

Meanwhile, many scholars have discussed citizens' participation; they emphasize that without participation of citizens every resilience urban planning is doomed to failure (Coaffee et al., 2009).

Coaffee (2013) observed that, firstly, citizens must believe that their participation in urban resilience project is in favor of their own. Meanwhile living people in the area of resilience urban planning projects have the most precise information and ideas on local resilience development project. In 1993, In a book named alphabet of urban management, Edward Lehman indicated the importance of citizens' participation in development process of resilience urban areas and its relationship to resilience city. He said that:

“Citizens and local organization all liable to perform six tasks to improve conditions of urban areas, metropolitan areas, provinces, or concerning country; they are obliged to improve urban land, natural environment, local installations and equipment, housing, social services, and economic development”. He emphasized that it is impossible to maintain the cities against natural disasters without citizens' active and volunteer participation (Lehmann and Crocker, 2013). Garcia observed that various factors are involved and affect citizens' participation in the project of resilience urban development planning including intention of participants, their motivation, their expectations of participation awards, and facilities as well as conditions of participation in urban development process. All of these factors are influential on the nature of urban development participation. He noted that main pre-conditions of urban participation are as follows:

Existence of participatory culture for urban development (Education and cultural promotion).

Procurement of socio-economic, political, and cultural structures and definition of appropriate civil right for participation at local (urban and rural), regional (provincial), and national level.

Existence of an urban management system (municipalities and city council), “ those who are eager to participate, those who are willing to participate and those who are intending to develop the participation process” (Garcia, 2006). Finally the conceptual model of the research is provided below (Fig. 2).

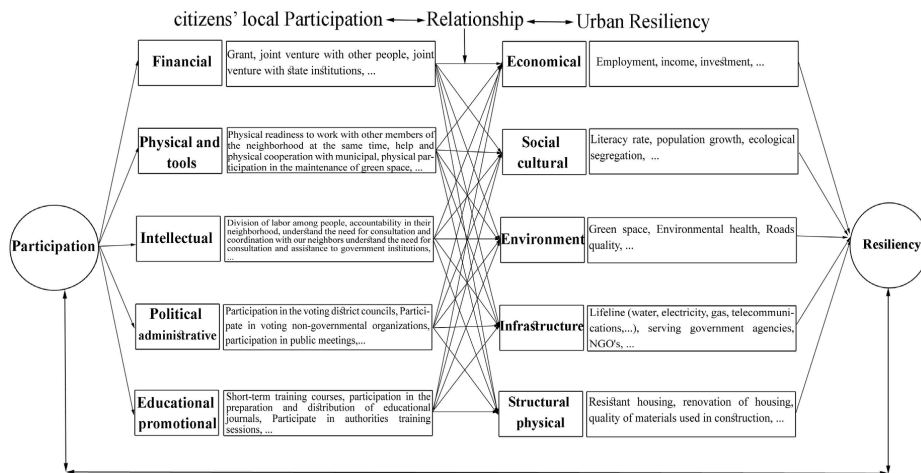


Figure 2. Conceptual model of Urban Resiliency Improvement with local Participation Approach.

RESEARCH METHODS

General purpose of this paper is to study role of citizens' participation on rate of urban resiliency. Type of research is descriptive analysis, its objective is development, and it is causal-comparative and correlational. Required research data is obtained through documentary method (secondary data) and field study (primary data). In the field study method, the implemented tool is based on a questionnaire, but in library method note-taking has been used. The number of required questionnaires of the paper, or the number of samples, is obtained by Cochran's formula. As mentioned, subjects under study were 18973 households residing in Bonab City. Due to the Cochran's formula, 95% confidence level, and an error rate of 0.05, 377 households were chosen to fill in the questionnaire. But for obtaining more realistic results of sample number, we added 23 subjects to increase the 377 households to 400. The mentioned households were residing in 13 districts of Bonab County and questionnaires distributed proportional to population of each district (Figure 3).

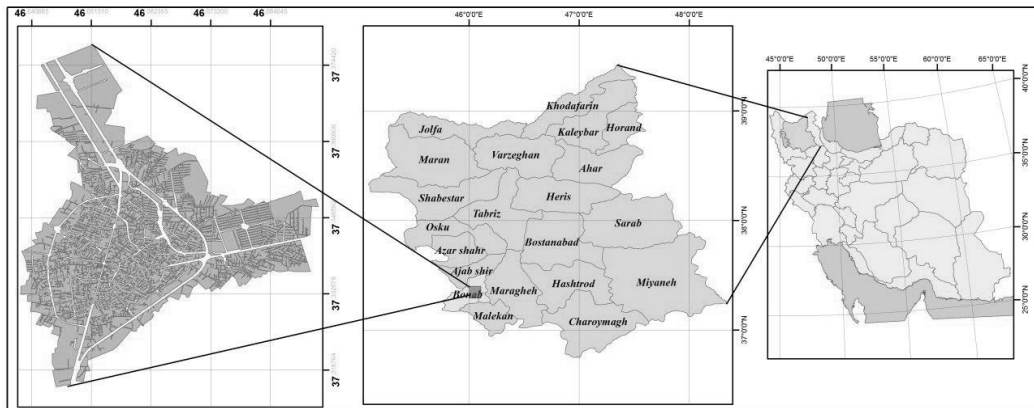


Figure 3. Geographical location of the study area.

The sampling method was simple and random among heads of households. Two types of questionnaires were developed based on concerning research variables. The first one was about participation variables and the second questionnaire was about variables of urban resilience. Moreover, research variables of local participation questionnaire are measured by 46 closed questions but urban resilience variables, by implementation of 45 closed questions. (Tab 2)

Table 2. Concerning variables to the dimensions of citizens' participation

	Dimension	Components	Reference
citizens participation	Financial	Grant, joint venture with other people, joint venture with state institutions, Payment of financial obligations to the municipality, Financial help to create local savings fund, using banking facilities to improve the neighborhood, creating income-generating public services in the neighborhood	Robbins et al. (2008)
	Physical and tools	Physical readiness to work with other members of the neighborhood at the same time, help and physical cooperation with municipal, physical participation in the maintenance of green space, ready to work without pay, participation in the collection and separation of waste, Helping neighbors in the building or reform their housing, put part of the Location for Public Works, transfer of own resources, to provide subordinates, providing spiritual strength in order to support	Mannarini et al. (2010)
	Intellectual	Division of labor among people, accountability in their neighborhood, understand the need for consultation and coordination with our neighbors understand the need for consultation and assistance to government institutions, trust in others, trust the authorities, Cooperation with neighboring women, believed to replace competition with cooperation in between peoples, peaceful resolution of conflicts, residents of the neighborhood, using the capacity of religious places for consultation and cooperation	Tomba (2009)
	Political and administrative	Participation in the voting district councils, Participate in voting non-governmental organizations, participation in public meetings, participate in question and answer sessions neighborhood, Understanding the necessity of women's participation in community affairs, Participation in teamwork and division of responsibilities neighborhoods, managers tend to involve citizens, participation in legal deficiencies participation, participation in decision making stable	Yang and Pandey (2011) John (2009)
	Educational and promotional	Short-term training courses, participation in the preparation and distribution of educational journals, Participate in authorities training sessions, Ready to offer their experiences to neighbors, readiness to transfer its experiences to the authorities, use of modern educational tools, establishing a permanent place in education neighborhoods, promote the participation of women empowerment, participation in children's basic skills, participation in the creation of the necessary conditions to promote vocational skills	Larson and Lach (2008)

Also variables of urban resilience have been based in Table 3 in this research.

Table 3. Concerning variables to the dimensions of urban resilience.

Urban resiliency	Dimension	Components	Reference
	Economical	Employment, income, investment, savings, job security, private sector, banking facilities	Ahern (2011)
	Social - cultural	Literacy rate, population growth, ecological segregation, social cohesion, social participation, attachment to place, social disorder, hope for the future, self-reliance, sense of social responsibility, understand the risks, social justice	Ahern (2013)
	environmental	Green space, Environmental health, Roads quality, Drinking water health, proper disposal of waste system, neighborhood aesthetics, topographical characteristics of the neighborhood	Pierce et al. (2011)
	Infrastructural	Lifeline (water, electricity, gas, telecommunications,...), serving government agencies, NGO's, local backup system, backup system flexibility, social services, temporary accommodation centers, health centers	Camfield (2012)
	Structural and physical	Resistant housing, renovation of housing, quality of materials used in construction, compliance with technical standards of construction, visual beauty of the building, protection of valuable historical context, forms of rural housing, road quality, resistance bunkers, the number of people in the room, good location Applications	Pierce et al. (2011)

The developed questionnaire for scoring variables used Likert five-scale spectrum. SPSS software was used in the scoring stage for negatively defined questions; thus re-encoding was accomplished for this group of questions. Therefore, the scoring of positive questions was so that 5 means full agreement, 4 means agreement, 3 means no idea, 2 means disagree, and 1 means complete disagreement but on negative questions it was different; there were five options (very low, low, average, high, and very high). Face validity of both questionnaires was supported by panel of experts. There were 50 questionnaires for guide study of similar region of statistic community specific formula of Cronbach's alpha that was used to obtain and calculate reliability of the questionnaire for participating citizens, which was 0.901, and reliability of urban resilience questionnaire, which was 0.896.

Correlation and inferential statistical methods such as Pearson's correlation test, stepwise multivariate regression method, and structural equation modeling were analyzed. Pearson's correlation test was used to specify correlation; multivariate regression test was used to study intensity and directions of correlation. Structural equation modeling analysis was implemented to develop a graphical inferential model for the investigation, Excel software, Pearson test analysis for description and classification of descriptive findings, and SPSS software was used to draw maps but ARC GIS software was used for prioritization and EQS software was used for analysis of structural equations. Finally, the following hypotheses have been tested in this research:

- Citizens' financial participation and promotion of urban resiliency are correlated positively and meaningfully;
- Citizens' physical-instrumental participation and promotion of urban resiliency are correlated positively and meaningfully;
- Citizens' rational-intellectual and promotion of urban resiliency are correlated positively and meaningfully;
- Citizens' political- directional and promotion of urban resiliency are correlated positively and meaningfully;
- Citizens' educational-promotional participation and promotion of urban resiliency are correlated positively and meaningfully.

RESEARCH FINDINGS

DESCRIPTIVE FINDINGS

61.25% of the respondents were men and 38.75% of them were women based on research findings. Concerning the age groups it was shown that 3545--year old subjects were 47.25% with the most frequency. On education, 33.5% had diploma with the most frequency. Moreover, research findings showed that average family was 4.7, area of housing 122.41 m², and participation frequency in urban management activity was equal to 7.5 for men and 3.6 for women.

INFERENCE FINDINGS

THE RESULTS OF SPEARMAN CORRELATION TEST

Regarding the written data in Table 4 results of Pearson's correlation coefficient, the relation of citizens' participation variable with urban resilience variable is positive with 1% error. According to the obtained results of the table, just political-directional participation is not meaningfully correlated but urban economic resilience is meaningfully correlated. All of five participation dimensions are correlated with social and cultural dimensions of urban resilience with 0.000% significance. Concerning the correlation of participation dimension with environmental resilience findings show that political-directional correlation is not meaningful but all dimensions are positively and meaningfully correlated. Also participation with substructure resilience is correlated with financial, educational-promotional positively and meaningfully; finally, participation with substructure-skeletal resiliency is negative for rational-intellectual but positive and meaningful for other aspects.

Table 4. Pearson's correlation coefficient to specify correlation between variables of citizens' participation and urban.

partnership Resilience	Financial	Physical- Tools	Intellectual	Political- administrative	Educational - promotional
Economic	p= 0.686 r= 0.000 n= 400	p= -0.342 r= 0.001 n= 400	p= 0.428 r= 0.000 n= 400	p= 0.030 r= 0.098 n= 400	p= 0.206 r= 0.002 n= 400
Socio-cultural	p= 0.323 r= 0.001 n= 400	p= 0.506 r= 0.000 n= 400	p= 0.417 r= 0.000 n= 400	p= 0.701 r= 0.000 n= 400	p= 0.756 r= 0.000 n= 400
Environmental	p= 0.476 r= 0.000 n= 400	p= 0.387 r= 0.000 n= 400	p= 0.389 r= 0.000 n= 400	p= 0.098 r= 0.079 n= 400	p= 0.568 r= 0.000 n= 400
Infrastructure	p= 0.587 r= 0.000 n= 400	p= 0.014 r= 0.102 n= 400	p= 0.086 r= 0.099 n= 400	p= 0.011 r= 0.082 n= 400	p= 0.221 r= 0.002 n= 400
Structural - Physical	p= 0.427 r= 0.000 n= 400	0.328p= r= 0.001 n= 400	P=0.087 r= 0.068 n= 400	p= 0.207 r= 0.001 n= 400	p= 0.321 r= 0.001 n= 400

THE RESULTS OF MULTIVARIATE REGRESSION

Based on the obtained beta standard, in this method, rational-intellectual, physical-instrumental, educational-promotional, political-directional, and financial variables had the greatest share in dependent variables, respectively. Due to the fact that all studied variables have meaningful correlation with urban resilience, they have remained in the final model. Results show that anticipating variables anticipate 87%, $r^2 = (0.87)$ of dependent variable (urban resiliency). Also, the coefficient of determination demonstrates that there are other effective variables for explanation of urban resilience but they are not analyzed in this study. An analysis result of one-sided variance illustrates meaningfulness of regression and linear relations of variables in final stage. Tables 5 and 6 show concerning data of the analysis. For the estimation equation final model of multivariate regression and according to the obtained data illustrated research results on the following table explain steps of regression equation (Table 5).

Table 5. Coefficients of multistage variable to explain correlation of citizens' participation and urban resilience.

Step	Variable name	Value(P)	Value(f)	Justified coefficient of determination	coefficient of determination	regression coefficient
1	Financial	0.000	152.23	0.547	0.699	-0.259
2	Physical-Tools	0.000	147.65	0.520	0.642	0.711
3	Intellectual	0.000	146.98	0.358	0.478	0.787
4	Political - administrative	0.001	138.80	0.140	0.279	0.412
5	Educational - promotional	0.002	135.54	0.098	0.209	0.565

Obtained results of data analysis on explanation power of concerning variables to citizens' participation on rate of urban resilience are calculated as shown in Table 6.

Table 6. Coefficients of entered variables to the final regression equation for correlation explanation of citizens' participation and urban resilience.

Predictor variables	Value (P)	(t) calculated	standardized coefficients	Not standardized coefficients	
			(β)	standard error	Login factor
constant number(Intercept)	0.000	7.32	-	3.09	35.79
Intellectual	0.000	3.75	0.454	0.598	4.63
Physical-Tools	0.000	6.52	0.563	0.745	7.97
Educational - promotional	0.000	7.32	0.556	0.569	6.57
administrative -Political	0.000	8.14	0.475	0.741	6.85
Financial	0.002	5.62	0.140	0.210	6.34

Based on the results concerning to the steps of regression equation, rational-intellectual, physical-instrumental, educational promotional, political-directional, and financial participation variables include steps one to five, respectively. Finally, structural equations of correlation between participation variables with urban resilience variables are illustrated in Figure 4.

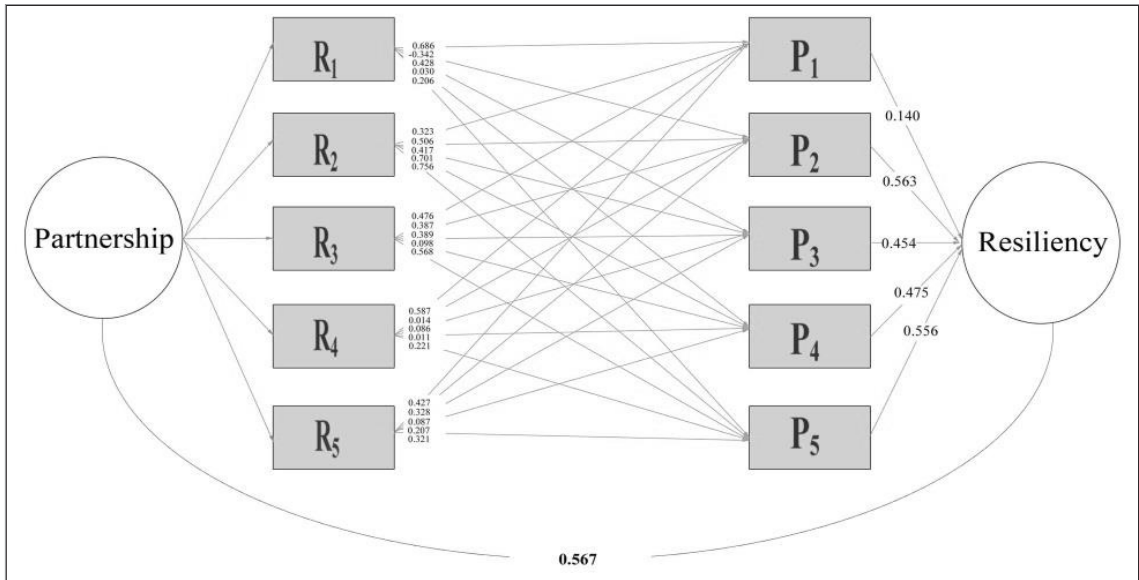


Figure 4. Structural equation on correlation between participation variables and urban resilience

For deep study, finally, we analyzed effective factors on participation and urban resilience for each urban district separately, then the obtained results are shown in Figures 5 and 6.

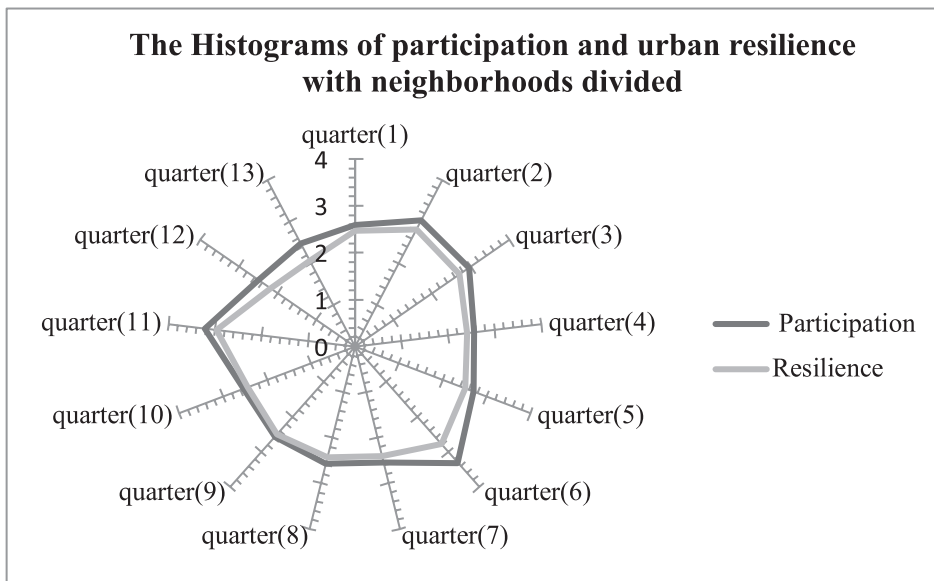


Figure 5. Histogram of participation and resilience for each urban district.

Based on the obtained results of the above diagram urban resilience of all districts was less than that of the citizens' participation. Its main cause is that other factors affect urban resilience except participation that is not analyzed in

this research. Moreover, there is a correlation between increased mean participation and increased mean resilience in all districts of Bonab City. In other words, in all cities, participation increase has resulted in increased resilience. Accordingly, studies showed that the greatest correlation is between increased mean participation and retrofitting housing variables in districts, observance of technical rules of construction, responsibility, high quality materials, and understanding of eventual risks. Also lines on the following diagram show that, in districts of 3, 4, 6, 12, and 13, there are more gaps between citizens' participation and the rate of urban resilience.

It is because districts 12, 13, and to some extent district 11, are informal residential places of Bonab City, they have been developed without consideration of urban development rules and regulations. Also reviews showed that the main reason of gap between participation and resilience in the three stages is more due to the lack of financial capacity for improvement and retrofit of housing, low quality material and poor hygiene of passages, low levels of literacy for irresponsibility, misunderstanding the risks, low participation level, and distrust to other people.

Moreover, the studies showed that, in three districts, rate of illiteracy, lack of interaction with neighbors and urban managers, migration rate, and limited women activities are higher. Moreover high gap between mean citizens' participation with urban resilience in district 6 is due to the fact that it is an old district in Bonab; its structure is completely old; although mean participation is high but low quality material, lack of urban green spaces, low environmental health, connected non-standard roads, poor hygiene districts, and so on have increased the gap of participation and urban resilience. Moreover, the studies showed that the average antiquity of residential houses in Bonab is 48.7 years. Finally, Figure 6 is prioritizing urban districts in Bonab for citizens' participation (Left Map) and it shows the rate of urban resilience (the right map).

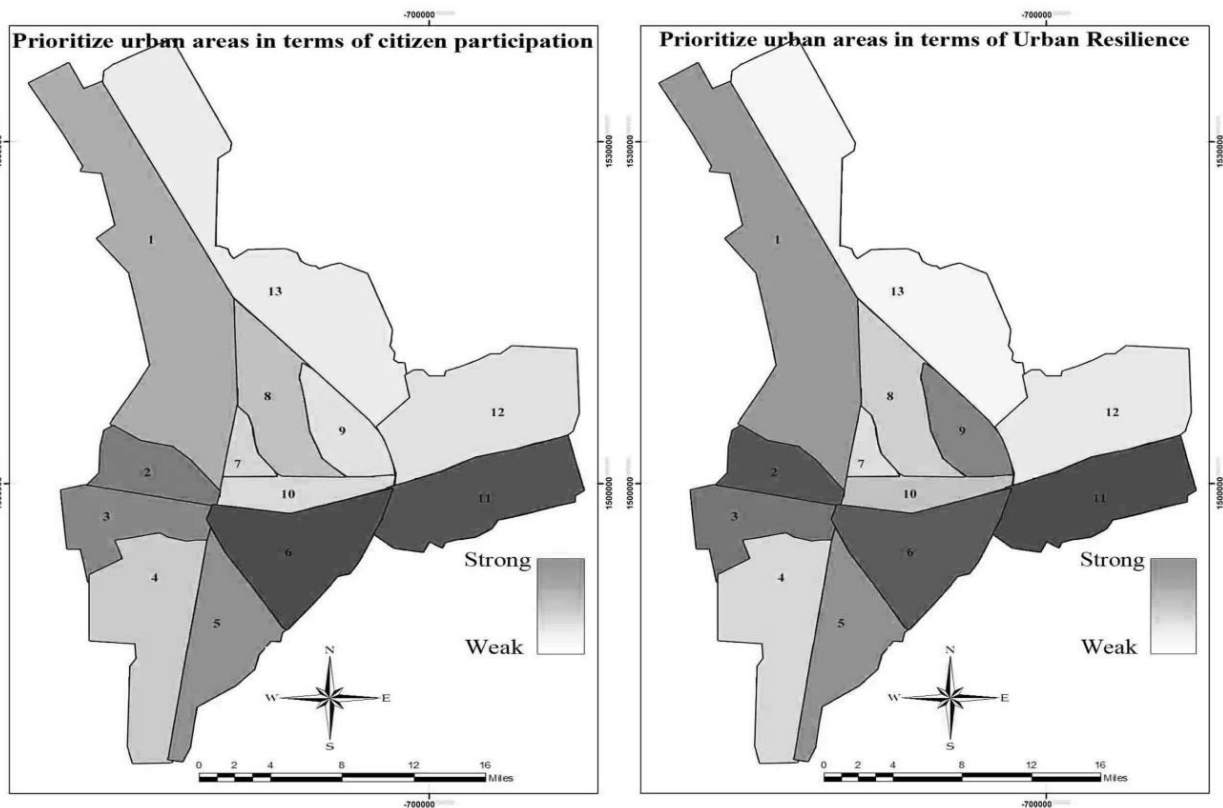


Figure 6. District prioritization in Bonab City in terms of participation and urban resilience.

DISCUSSION AND CONCLUSION

As mentioned in the research, increase of urbanization development has created many problems for people and citizens. Unplanned urban development especially in the third world states has increased social and psychological issues in these areas and they are intensively vulnerable against natural disasters. Cities are made resilient to prevent citizens' financial and life losses against risks, because theoreticians believe that urban resilience prevents high losses in the first step; secondly, it helps citizens on the return to normal life. Although urban resilience has positive effects but there are many urbanism issues that make the governments incapable of eliminating the issues and creating a resilient city.

Despite the fact that urban resilience has been placed in the center of attention for more than 3 decades, many of its dimensions such as the role and importance of public participation in urban resilience have not been investigated yet. So considering the active nature of urban resilience and its dimensions it is better for urban authorities to seek a coherent system of resilience that can be driven from needs and demands and native experiences of citizens. It is necessary to give a practical solution to the issue, while social managers and theoreticians most seriously focus on citizens' participation in urban management; then government entrustment is the main burden of urban management to the citizens who are the main beneficiaries of city; government costs are decreased, and city is fortified against accidents. Additionally, citizens' participation in urban affairs is compatible with modern principles of democracy. Therefore, urban resilience is important and citizens' participation in urban management is constructive to eliminate possible risks. The purpose of this paper is to analyze constructive role of citizens' participation in urban resilience. Findings of Pearson correlation test showed that the majority of five dimensions of urban participation are correlated positively and meaningfully to five dimensions of urban resilience.

Indeed, among 25 items of studied correlation, both dependent variables and independent ones, other participation and urban resilience variables are correlated positively and meaningfully except political-directional participation with economic resilience; political-directional participation with environmental resilience; rational-intellectual participation with structure resilience; physical-instrumental participation with structural resilience and rational-intellectual participation with physical-physical resilience. Among 5 groups of variables concerned with citizen participation, financial variables with correlation coefficient of 0.686 have the greatest correlation with urban resilience. As theoreticians observed and successful countries experienced we may conclude that every participation in each level and with each manner has constructive effects.

The findings of Brody et al. (2003) show that citizen's participation has several effects in optimal urban management; also participators have higher level of social vitality; meanwhile, they adhere more to construction rules and regulations; there is a high rate of social capital among them. In other words, citizens improve and retrofit all available urban elements in their habitat and make it more resilient against natural disasters and man-made risks. Moreover the findings of this research dimension of the theoretical framework of citizen participation show that, similar to other advantages of local participation of citizens in urban management, this topic (citizen participation) has a positive effect on promotion of urban resilience against different hazards. Also the finding of JHA et al. (2013) and Bahadur, A. and T.Tanner (2014) is consistent with the theoretical framework of this study.

Multivariate regression test showed that all participation variables are meaningfully correlated to urban resilience; they can anticipate 87% of dependent variable variance, named urban resilience.

Additionally, the final model of multivariate regression test showed that variables of rational-intellectual variables, physical-instrumental, educational- promotional, political-directional, and financial variables affect urban , respectively. The results support research findings of Berke and Campanella (2006), Norris et al. (2008), and they are compatible. In other words, common results show that citizens are willing to participate in urban management affairs; they intend to participate physically and rationally because they are poor and they have financial problems. Moreover they like to participate in training and promotion; it is an indication that they are motivated to learn skills, increase their knowledge, and transfer their experiences to others. As mentioned, financial investment is very important for the citizens but financial participation is the lowest level element in participation for improvement of residential district resilience.

Thus, to support citizens' financial participation it is better that a long-term planning be implemented for steady employment of poor people of the city, and to diversify income sources to strengthen economic bases of the families. Additionally, a short-term planning such as granting low interest bank loans to the citizens is one way to increase urban resilience, especially in poor and informal districts. As mentioned other dimensions of participation are very important in urban resilience increase process.

Physical-instrumental, educational-promotional, and rational-intellectual elements of participation have significant effects. Therefore, it is better for the citizens to take part in training and promotional classes to learn modern knowledge and skill and transfer them to others, even to the authorities; they must use knowledge and skill through physical participation. Moreover, participating citizens may know needs and requirements of other citizens. Consequently, their capacity and responsibility are increased for problem solution. Also, their participation in political and leadership activities is an indication that they have enough capacity to implement their comments; finally their self-confidence in constructive work would increase their residential resilience. Moreover, it is better to focus on all dimensions of citizens' participation even other elements in a systematic management approach by the planners to recognize positive effects of participation and to prevent personal tact encounter in urban resilience.

Also regarding the research findings and concerning the social, financial and environmental conditions of Bonab City the following suggestions are provided:

- Adopting policies and facilitation of performing society-oriented programs for drawing attention of local participation of citizens in promotion of vulnerable spaces of the city.
- Creating mechanisms for promoting resilience of communities based on the social learning tradition and extensive educational programs.
- Establishing an educational and promotional system to promote public awareness of the need for participation in resilience.
- Creating local and fair job opportunities, free of discrimination and social exclusion for universal participation in urban management for resilience.
- Establishing and supporting community-based organizations active in issues of public participation, crisis management and resilience.

REFERENCES

- Abbott, J. 2013.** *Sharing the city: community participation in urban management*, Routledge.
- ADPC. 2004.** *CBDRM Field Practitioners' Handbook, Asian Disaster Preparedness.*
- Ahern, J. 2011.** "From fail-safe to safe-to-fail: Sustainability and resilience in the new urban world. *Landscape and Urban Planning*. **100**(4): 341–343.
- Ahern, J. 2013.** "Urban landscape sustainability and resilience: the promise and challenges of integrating ecology with urban planning and design." *Landscape Ecology*. **28**(6): 1203–1212.
- Arnersterins. 2006.** *ladder of citizen participation*, journal of planning association.
- Ayyub, B. M. 2014.** "Systems resilience for multihazard environments: Definition, metrics, and valuation for decision making." *Risk analysis*. **34**(2): 340–355.
- Bahadur, A. & T. Tanner. 2014.** "Transformational resilience thinking: putting people, power and politics at the heart of urban climate resilience." *Environment and Urbanization* **26**(1): 200–214.
- Beatley, T. 2012.** *Green urbanism: Learning from European cities*, Island Press.
- Berke, P. R. & T. J. Campanella. 2006.** "Planning for postdisaster resiliency." *The Annals of the American Academy of Political and Social Science*. **604**(1): 192–207.
- Bonanno, G. A., et al. 2004.** "Prospective patterns of resilience and maladjustment during widowhood." *Psychology and aging*. **19**(2): 260–271.

- Bonanno, G. A. et al. 2006.** “Psychological resilience after disaster New York city in the aftermath of the September 11th Terrorist Attack.” *Psychological Science*. **17**(3): 181–186.
- Breuste, J. et al. 2013.** *Urban ecology*, Springer Science & Business Media.
- Brody, S. D. et al. 2003.** “Mandating citizen participation in plan making: Six strategic planning choices.” *Journal of the American Planning Association*. **69**(3): 245–264.
- Bruneau, M., S. E. Chang, R. T. Eguchi, G. C. Lee, T. D. O’Rourke, A. M. Reinhorn, M. Shinozuka, K. T. Tierney, W. A. Wallace & D. von Winterfeldt. 2003.** A framework to quantitatively assess, and enhance the seismic resilience of communities, *Earthquake Spectra*: **19**(4): 733–752.
- Camfield, L. 2012.** “Resilience and well-being among urban Ethiopian children: What role do social resources and competencies play?” *Social indicators research*. **107**(3): 393–410.
- CED. 2000.** *The Community Resilience Manual: A Resource for Rural Recovery and Renewal*, ISBN: 10-40-895818-, The Center for .Community Enterprise, British Columbia, Canada.
- Coaffee, J. 2013.** “Rescaling and Responsibilising the Politics of Urban Resilience: From National Security to Local Place-Making.” *Politics*. **33**(4): 240–252.
- Coaffee, J. et al. 2009.** “The everyday resilience of the city.” *Human Security and Resilience*.
- Collier, M. J., Nedović-Budić, Z., Aerts, J., Connop, S., Foley, D., Foley, K., . . . Verburg, P. 2013.** Transitioning to resilience and sustainability in urban communities. *Cities*, **32**, S21-S28.
- CSIRO Australia, Arizona State University, Stockholm University. 2007.** *A Resilience Alliance Initiative for Transitioning Urban Systems towards Sustainable Futures*,
- Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E. Webb & J. 2008b.** A place-based model for understanding community resilience to natural disasters, *Global Environmental Change*. **18**: 598–606.
- Cutter, Susan L., Lindsey Barnes, Melissa Berry, Christopher Burton Elijah Evans, Eric Tate & Jennifer Webb. 2008a.** *Community and Regional Resilience: Perspectives from Hazards, Disasters, and Emergency .Management*, CARRI Research Report1.
- Eizenberg, E. 2012.** “The changing meaning of community space: Two models of NGO management of community gardens in New York City. *International journal of urban and regional research*. **36**(1): 106–120.
- Emergency Management Australia (EMA). 2001.** *Assessing resiliency and vulnerability: principles, strategies and actions*, Philip Buckle .Graham Marsh and Sydney Smale.
- Ernstson, H. et al. 2010.** “Urban transitions: on urban resilience and human-dominated ecosystems.” *Ambio*. **39**(8): 531–545.
- Evans, A. M. & A. Campos. 2013.** “Open government initiatives: Challenges of citizen participation.” *Journal of policy analysis and management*. **32**(1): 172–185.
- Fleischhauer, M. 2008.** “The role of spatial planning in strengthening urban resilience.” *Resilience of Cities to Terrorist and other Threats*. Springer Science+ Business Media BV: 273–298.
- Foster, H.D. 1997.** *The Ozymandias principles: Thirty-one strategies .for surviving change*, UBC Press, Victoria, Canada.
- Garcia, M. 2006.** “Citizenship practices and urban governance in European cities.” *Urban Studies*. **43**(4): 745–765.
- Godschalk, D. R. 2003.** “Urban hazard mitigation: creating resilient cities.” *Natural hazards review*. **4**(3): 136–143.
- Godschalk, David R. 2003.** *Urban Hazard Mitigation: Creating Resilient Cities*, *Natural Hazards Review*. **4**(3): 136–143.
- Hartz-Karp, J. & H.-P. Meister. 2011.** *Creating resilient cities through empowered, deliberative participation*. Resilient Cities, Springer: 177–185.
- Henestra, D., Kovacs, P., McBean, G. & Sweeting, R. 2004.** *Background Paper on Disaster Resilient Cities*, Institute for Catastrophic Loss Reduction.
- Hollnagel, E. et al. 2007.** *Resilience engineering: Concepts and precepts*, Ashgate Publishing, Ltd.
- Jabareen, Y. 2013.** “Planning the resilient city: Concepts and strategies for coping with climate change and environmental risk.” *Cities*. **31**: 220–229.
- Jha, A. K. et al. 2013.** *Building urban resilience: principles, tools, and practice*, World Bank Publications.

- John, P. 2009.** "Can citizen governance redress the representative bias of political participation?" *Public administration review*. **69**(3): 494–503.
- Kaplan, H. B. 2005.** Understanding the concept of resilience. *Handbook of resilience in children*, Springer. 39–47.
- Keck, M. & P. Sakdapolrak. 2013.** "What is social resilience? Lessons learned and ways forward." *Erdkunde*. 5–19.
- Klein, R. J. et al. 2003.** "Resilience to natural hazards: How useful is this concept?" *Global Environmental Change Part B: Environmental Hazards*. **5**(1): 35–45.
- Kohlhase, J. E. 2013.** "The new urban world 2050: perspectives, prospects and problems." *Regional Science Policy & Practice*. **5**(2): 153–165.
- Larson, K. L. & D. Lach. 2008.** "Participants and non-participants of place-based groups: An assessment of attitudes and implications for public participation in water resource management." *Journal of environmental management*. **88**(4): 817–830.
- Lehmann, S. & R. Crocker. 2013.** "The consumption dilemma: From behaviour change to zero waste." *Motivating Change: Sustainable Design and Behaviour in the Built Environment*: 419.
- Leichenko, R. 2011.** "Climate change and urban resilience." *Current opinion in environmental sustainability*. **3**(3): 164–168.
- Lightsey, O. R. 2006.** "Resilience, meaning, and well-being." *The Counseling Psychologist*. **34**(1): 96–107.
- Longstaff, P. H., Armstrong, N. J., Perrin, K., Parker, W. M. & Hidek M. A. 2010.** Building resilient communities: a preliminary framework .for assessment, Homeland security affairs. (6)3.
- Mannarini, T. et al. 2010.** "Public involvement: How to encourage citizen participation." *Journal of Community & Applied Social Psychology*. **20**(4): 262–274
- Manyena, S. B. 2006.** "The concept of resilience revisited." *Disasters*. **30**(4): 434–450.
- Mayunga, Joseph S. 2007.** Understanding and applying the concept of community disaster resilience: a capital-base approach, A draft working .paper prepared for the summer academy for social vulnerability are resilience building, Munich, Germany.
- McEntire, D. A. et al. 2002.** "A comparison of disaster paradigms: The search for a holistic policy guide." *Public administration review*. **62**(3): 267–281.
- Miao, P. 2011.** "Brave new city: three problems in Chinese urban public space since the 1980s." *Journal of Urban Design*. **16**(02): 179–207.
- Moradi, A. S. et al. 2011.** "Microseismicity and seismotectonics of the North Tabriz fault (Iran)." *Tectonophysics*. **506**(1): 22–30.
- Müller, B. 2011.** Urban and regional resilience—A new catchword or a consistent concept for research and practice? *German Annual of Spatial Research and Policy 2010*, Springer: 1–13.
- NOAA, Coastal Services Center. 2007.** Summary of the NOAA Three .community Resilience Salons, Washington D.C.: NOAA, Coastal Services Center.
- Normandin J.-M, Therrien M.-C. & Tanguay G.A. 2011.** City strength .in times of turbulence: strategic resilience indicators, Urban Affairs Association 41st Conference, New Orleans.
- Norris, F. H. et al. 2008.** "Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness." *American journal of community psychology*. **41**(1–2): 127–150 .
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F. & Pfefferbaum, R. L. 2008.** Community Resilience as a Metaphor, Theory Set of Capacities, and Strategy for Disaster Readiness, *Am J Community .Psychol*. **41**: 127–150.
- Olshansky, R. B. & J. D. Kartz. 1998.** Managing land use to build resilience, In *Cooperating with nature: confronting natural hazards with .land use planning for sustainable communities*, edited by R. J. Burby .Washington, D.C., Joseph H.
- Pierce, J. et al. 2011.** "Resilience and sustainability in US urban areas." *Environmental Politics*. **20**(4): 566–584.
- Portney, K. E. & J. M. Berry. 2010.** "Participation and the pursuit of sustainability in US cities." *Urban Affairs Review*. **46**(1): 119–139.
- Richardson, G. E. 2002.** "The metatheory of resilience and resiliency." *Journal of clinical psychology*. **58**(3): 307–321.
- Robbins, M. D. et al. 2008.** "Citizens and resource allocation: Improving decision making with interactive web-based citizen participation." *Public administration review*. **68**(3): 564–575.
- Robert, B. & C. Lajtha. 2002.** "A new approach to crisis management." *Journal of contingencies and crisis management*. **10**(4):

181- 191.

Rutter, M. 2000. “Resilience reconsidered: conceptual considerations, empirical findings, and policy implications.”

Serre, D. et al. 2012. Resilience and urban risk management, CRC Press.

Smokowski, P. R. et al. 2000. “Resilience and protective factors in adolescence: An autobiographical perspective from disadvantaged youth.” *Journal of school psychology*. **37**(4): 425–448.

Stevens, M. R. et al. 2010. “Creating disaster-resilient communities: Evaluating the promise and performance of new urbanism.” *Landscape and Urban Planning*. **94**(2): 105–115.

Stumpp, E.-M. 2013. “New in town? On resilience and “Resilient Cities”.” *Cities* 32: 164–166.

Tanner, T. et al. 2009. “Urban governance for adaptation: assessing climate change resilience in ten Asian cities.” *IDS Working Papers*. (315): 01–47.

Tomba, L. 2009. “Of quality, harmony, and community: Civilization and the middle class in urban China.” *Positions*. **17**(3): 591–616.

Wu, J. 2013. “Landscape sustainability science: ecosystem services and human well-being in changing landscapes.” *Landscape Ecology*. **28**(6): 999–1023.

Yang, K. & S. K. Pandey. 2011. “Further dissecting the black box of citizen participation: When does citizen involvement lead to good outcomes?” *Public administration review*. **71**(6): 880–892.

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تحسين المرونة الحضرية عن طريق نهج لمشاركة المواطنين المحليين في إيران دراسة حالة: مدينة بناب

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الخلاصة

في الوقت الحاضر، تهدد العديد من المخاطر الحياة الحضرية. والمرونة الحضرية مهمة للغاية لمواجهة هذه المخاطر. وتطوير المرونة الحضرية لديه بعض المتطلبات الأساسية مثل المشاركة الواسعة من قبل المواطنين. إن الغرض من هذا البحث هو دراسة دور مشاركة المواطنين في تحسين المرونة الحضرية، فهو عبارة عن بحث وصفي تحليلي تطبيقي. كما أن نوع البحث هو ارتباطي - سببي. والأشخاص هم السكان الذين يعيشون في 13 منطقة من المناطق الحضرية في بناب بإيران. فباستخدام طريقة أخذ العينات العشوائية البسيطة وصيغة كوكران (Cochran formula)، حصلنا على عينة حجمها 400. بالإضافة إلى ذلك، تم إجراء اختبار معامل الارتباط لبيرسون (Pearson) واختبار الانحدار المتعدد التدريجي (stepwise multivariate regression test). ومن خلال الاستفادة من صيغة ألفا كرونباخ (Cronbach's alpha) الخاصة، حصلت موثوقية استبيان البحث على 0.901 في استبيان المشاركة و 0.896 في استبيان المرونة الحضرية. وأظهرت نتائج اختبار بيرسون أن غالبية متغيرات المشاركة ترتبط بمتغيرات المرونة الحضرية. كذلك، أوضحت نتائج التراجع متعدد المتغيرات أن متغير أدوات قياس المشاركة المادية أكثر قوة عند تفسير الاختلافات في المرونة الحضرية وأن المتغيرات التعليمية - الترويجية والسياسية - الإدارية والمالية - الفكرية هي المتغيرات المتبقية على التوالي. وهذه المتغيرات الخمسة قادرة على تفسير 0.87% من متغيرات المرونة في المناطق الحضرية. وأخيراً، قدمنا اقتراحات عملية حول تحسين المرونة الحضرية من خلال دعوة المواطنين للمشاركة.