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Ostadtaghizadeh, Abbas; Ardalan, Ali; Paton, Douglas; Khankeh, Hamidreza; Jabbari, Hossain

Published in:
Co-designing DRR Solutions

Published: 01/01/2017

Document Version
Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Ostadtaghizadeh, A., Ardalan, A., Paton, D., Khankeh, H., & Jabbari, H. (2017). Assessment of Community Disaster Resilience in Tehran, Iran: A Multidisciplinary Approach. In R. Shaw, E. Y. Y. C. Chan, F. Lian, L. Lu, P. Shi, S. Yang, G. K. W. Chan, & J. S. T. Wong (Eds.), *Co-designing DRR Solutions: Towards participatory action and communication in science, technology and academia* (pp. 54-56). Asia Science Technology and Academia Advisory Group (ASTAAG). http://ccouc.org/_asset/file/co-designing-drr-solutions-ebooks.pdf

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Assessment of Community Disaster Resilience in Tehran, Iran: A Multidisciplinary Approach

Abbas Ostadtaghizadeh, Tehran University of Medical Sciences, Tehran, Iran

Ali Ardalan, Tehran University of Medical Sciences, Tehran, Iran

Douglas Paton, Charles Darwin University, Darwin, Australia

Hamidreza Khankeh, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Hossain Jabbari, Tehran University of Medical Sciences, Tehran, Iran

In recent years community disaster resilience (CDR) has been one of the most common approaches to disaster risk management (1,2). Despite conceptually focus on these issue, the methods and plans for operationalization of CDR are still in preliminary phases (2,3). In order to understanding disaster risk for improving risk governance in local level, there was a great need to develop a quantitative, conceptual-oriented, culture-bounded, comprehensive, local based, and weighted assessment tool which evaluate the level of CDR in the community (4).

While CDR assessment and planning is a multidimensional, multidisciplinary and multi-sectoral action, through purposeful sampling, 21 participants (with adequate knowledge and at least five year experience in disaster management) from different disciplines were selected to participate in all phases of the program. A participatory CDR assessment tool was developed in four phases as follows:

- A systematic review study was conducted to investigate CDR assessment tools, and to find the domains, indicators, and indices that have been considered in these tools. In general, three main CDR assessment tools were found (4).
- A qualitative research using content analysis was conducted to explain conceptual and working definitions of CDR. Furthermore, domains, subdomains and indicators of CDR in Iranian context were explored by this study (5).
- A psychometric process was conducted for developing an assessment tool. Using item generation and item reduction, a primary tool was developed. Validity and reliability of the developed tool were evaluated by face and content validity, factor analysis process, Cronbach's α coefficient (equal to 0.89), and Inter Class Correlation (ICC= 0.83). Thereafter, using Analytical Hierarchy Process (AHP), the validated tool was weighted and normalized in all its domains, subdomains, and indicators.
- The information of different stakeholders was integrated in a unified data bank and then the level of CDR was assessed in six domains (institutional, social, economic, cultural, physical, and environmental), 16 subdomains, and 66 indicators.

The results were classified in five categories including very low, low, medium, high, and very high. Each level respectively was shown with red, orange, yellow, green, and blue. For better contribution of the results, using tables as well as Arc GIS software, different geographical maps for different neighborhoods, and different domains, subdomains and indicators were provided. Figures1 and 2 are some samples of provided tables and maps.

	تاب آوری					
	حیطه نهادی	حیطه اقتصادی	حیطه فرهنگی	حیطه اجتماعی	حیطه فیزیکی	حیطه زیست محیطی
کاشانک	0/75	0/46	0/40	0/45	0/75	0/50
بردستان	0/76	0/60	0/58	0/51	0/75	0/67
دروس	0/66	0/76	0/59	0/51	0/73	0/55
کاظم آباد	0/55	0/50	0/50	0/49	0/73	0/56
جنت آباد شمالی	0/56	0/65	0/58	0/50	0/74	0/50
دانشگاه تهران	0/61	0/46	0/65	0/52	0/81	0/53
بناظر آباد	0/72	0/60	0/42	0/48	0/71	0/59
مدائن	0/63	0/53	0/50	0/52	0/75	0/58
امامزاده عبدالله	0/46	0/55	0/40	0/48	0/69	0/52
سرسبیل جنوبی	0/72	0/59	0/45	0/51	0/65	0/55
عالم احمد	0/56	0/56	0/38	0/46	0/75	0/57
شهید هرنلی	0/58	0/20	0/32	0/45	0/84	0/55
شورا	0/60	0/58	0/48	0/51	0/73	0/60
شکوفه	0/60	0/61	0/45	0/51	0/70	0/58
شوش	0/59	0/52	0/35	0/48	0/67	0/57
جوادیه ۱۶	0/62	0/53	0/39	0/51	0/78	0/53
باغ عزت	0/69	0/21	0/41	0/49	0/70	0/54
بهداشت	0/53	0/58	0/41	0/49	0/70	0/50
غنی آباد شمالی	0/85	0/64	0/41	0/50	0/75	0/52
قدسیه	0/71	0/59	0/41	0/49	0/73	0/60
شهرک شهرداری	0/57	0/64	0/43	0/52	0/70	0/40
گلستان شرقی	0/67	0/61	0/49	0/48	0/70	0/47

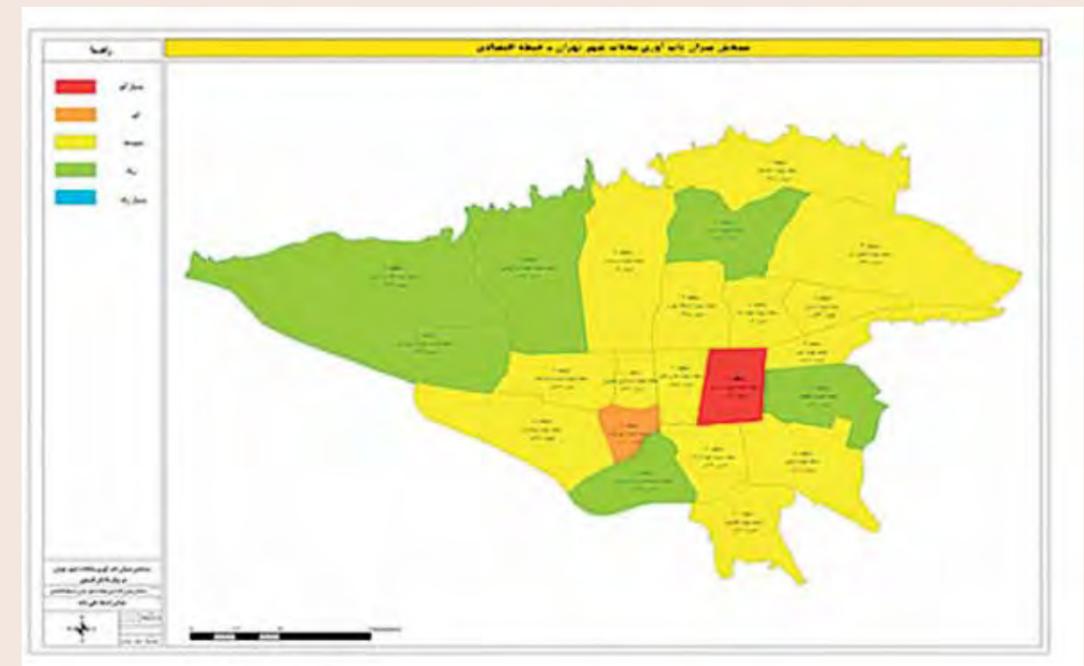


Figure 1 and 2: Samples of tables and maps of community disaster resilience assessment in Tehran.

Currently a dynamic and on-line disaster resilience monitoring system has been launched in Tehran's municipality portal (figure 3) which shows the level of disaster resilience in all 375 Tehran's neighborhoods. Using this system all local authorities and policy makers are able to see the results, develop neighborhood-dedicated disaster resilience action plans, implement the plans and monitor the changes which might happen in each indicator, subdomain or domain of disaster resilience during the time.

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Community Awareness and Response in 2010 Bumthang Great Fire, Bhutan

Emily Y.Y. Chan, Kevin Hung, Carol K.P. Wong, Rinzin Jamtsho and Janice Y. Ho,
Collaborating Centre for Oxford University and CUHK for Disaster and Medical Humanitarian Response,
The Chinese University of Hong Kong, Hong Kong, China

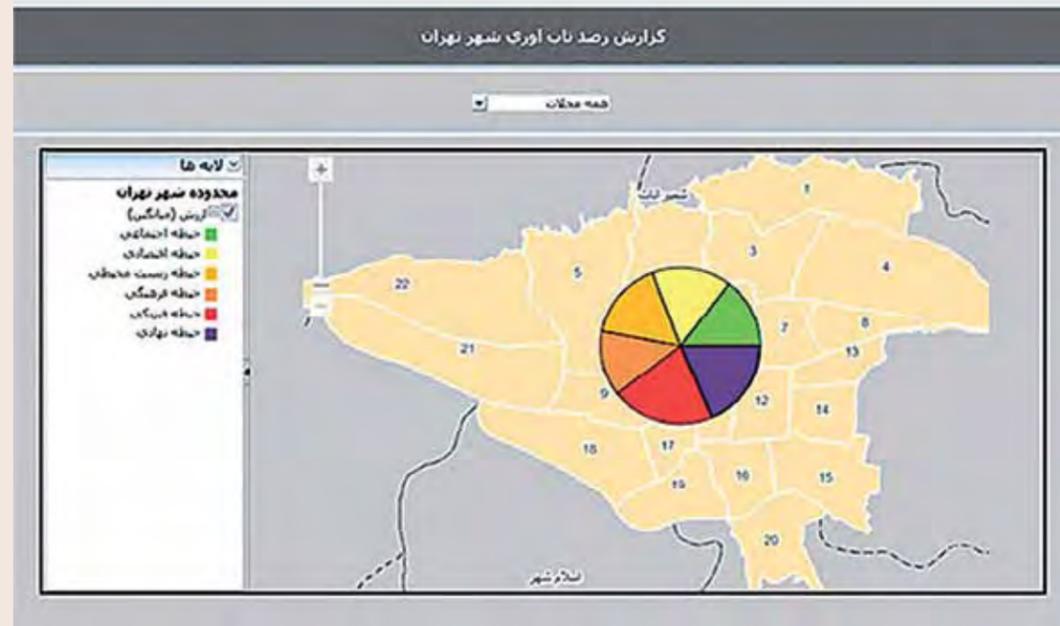


Figure 3: A view of on-line disaster resilience monitoring system

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Contact

For any inquiries on the case, please contact the author Abbas Ostadtaghizadeh at ostadtaghizadeh@gmail.com.

Introduction

Bhutan is a landlocked and developing country that is vulnerable to various natural disasters such as earthquake and floods. Because of the heavy reliance on wood for fuel, infrastructure and building houses, fire is also a frequent occurrence in Bhutan. In 2010, a fire occurred in Bumthang, Bhutan and burnt down closely-positioned buildings in a matter of hour. This case study highlights the key lessons learnt in an urban fire disaster, hence identifying the disaster response in developing countries like Bhutan.

Disaster event and damage

On 26 October 2010, a fire disaster occurred in Bumthang, Bhutan. It started in a mobile phone shop and lasted for 3 hours (1). Due to the community practice of chaining up rooms of the hostel at night at this internal migrant transitioning town, the tragic fire disaster took away two lives and 267 residents were rendered homeless. Psychological problems were found in the affected population, reporting having experience of mood swings and sleeplessness, as well as even anxiety when seeing fire, especially children. Fifty-nine shops including hotels were destroyed in the fire, and which also caused property loss to the shop keepers.



Figure 1: Map of Bhutan, with Bumthang district outlined by red line



Figure 2: Premise destroyed by fire

Multi-disciplinary approach in disaster risk reduction

Different levels, national, district, sub district, municipality and community levels had their own responsibilities in both the pre-disaster phase as well as the post-disaster phase (2). The Department of Disaster Management under the Ministry of Home and Cultural Affairs was the nodal agency coordinating national disaster risk mitigation, response, relief, and rescue operations. After the fire disaster, the Bhutanese government mobilized different resources from within and externally to help the affected people, by providing free services and reconstruction for the survivors. More than 300