

CASE STUDY

The role of passive defense in urban crisis management from urban managers' perspective

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ABSTRACT

The main objective of this research is to determine the role of passive defense in urban crisis management from the perspectives of experts and urban managers Municipality of Tehran- District, 5. In order to carry out the study, an analytical-applied research method and a combination of documentary, descriptive, analytical and case study methods are used. All managers and experts of Tehran's municipality in the District (n=950) at all divisions and departments constitute the population of this study. 274 samples are selected using simple random sampling method. A researcher-made questionnaire is used as research tool whose validity and reliability are tested based on the views of the research supervisor, advisor, experts and managers of the municipality, and Cronbach's alpha test ( $\alpha = 0.787$ ), respectively. Then, data analysis is performed using SPSS software (v21). According to the research findings, passive defense is effective in reducing damages to cities and application risk, and developing a proper pattern for urban sustainability using experts and managers perspective ( $p < 0.05$ ).

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INTRODUCTION

The lives of citizens of cities and metropolises are subject to a wide range of dangers and crises. These crises have always the potential of threatening safety and security of families, individuals and citizens at local, urban and national levels. Many of the victims of natural and humanitarian crises all over the world live in metropolitan cities in developing countries, which is, of course, due to the low income and poverty of the inhabitants of these countries. In order to overcome the natural and human made crises, it is important to consider two rational

approaches; understanding how human behavior contributes to developing a crisis (natural or man-made), and what general strategies are needed to prevent crises from occurring and provide security in metropolises (Rahnamaei *et al.*, 2013). Familiarity with different types of crises help urban planners to consider appropriate strategies to deal with them; one of these strategies is passive defense. Indeed, it may be said that passive defense is the same as crisis management within the sphere of defense threats and war events. In every crises, safety and security are among the most basic principles for achieving favorable standards for the public comfort and welfare, and passive defense against foreign threats is one of

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the most urgent needs in the early stages of urban planning and important installations so as to provide maximum security with the least effort for people to defend themselves against threats, and on the other hand, cause the greatest difficulty for the enemy to hurt them (Kamran et al., 2012). Passive defense (with high emphasis on pre-crisis management) is an unarmed act which results in reducing damage to and maintaining the safety of human resources, buildings, installations and equipment against natural and man-made crises (Movahedi Nia, 2007). Passive defense is a set of unarmed actions that increase inhibition, reduce vulnerability, keep up vital activities, promote national sustainability and facilitate crisis management, and ultimately, provide national security (Nikoomanesh and Nazarkhah, 2014), and results in reduced damage to human resources, buildings, installations, equipment, document, and main pillars of the country in face of natural (droughts, earthquakes, earth drifting and slipping, storm) and man-made (war, national rebellion, sanction) crises (Abbaszade et al., 2011). In other words, passive defense is investment on potentials of human agency and human category (Parizady et al., 2010). One of the most important characteristics of a good city for reducing these damages is accessibility. Accessibility can be categorized in different ways; that is, accessibility to activities, goods and resources, places, and information (Fuller and Moore, 2017). Here, accessibility refers to spatial and temporal proximity to services (Parizady et al., 2010). Passive defense plans are developed before crisis, at the time of peace, and include design for all steps of crisis management. Basic definitions of passive defense may unwittingly focus one's attention on political and military defense issues, rather than events and crises caused by natural forces; however, the truth is that, in addition to reducing damage caused by human-made threats, passive defense measures in residential areas are also useful in reducing risks in face of natural hazards (Mitroff, 2012). Crisis management is a process of planning and performance that, through systematic review of crises and their analysis, seeks a way to prevent crisis, or when it occurs, helps us to reduce impacts, be prepared, prompt relief measures, and improve the situation. The more the extent of communication between organizations dealing with the crisis, the better the efficiency of crisis management will be. Promptitude of decision

making is very important in crisis management. In fact, there is a direct relationship between the promptitude of decision making and the pace of crisis management. In other words, the higher the promptitude of decision making by crisis managers, the higher the pace of crisis control will be. Several studies and researches such as Adeli et al., (2016); Rahmani Fazli et al., (2016); Jadidi (2016); Akhbari and Ahmadi Moghaddam (2014); and Coaffee (2009) reported a relationship between passive defense and crisis management. In such circumstances, any natural or man-made crises would result in an irreparable damage and leave adverse effects on the activities of the region and even the whole country. Passive defense is not about war or peace yet it is a preparation to deal with natural and man-made crises and disasters. Therefore, knowing about it is a must, lack of public knowledge may be due to lack of systematic dealing with passive defense which nowadays is known as a military term. Thus, considering the importance of the aforementioned issues, in this research, the role of passive defense in urban crisis management from experts' and managers' perspective in District 5 of Municipality of Tehran is discussed. So, the main question in this research is: "Does passive defense affect urban crisis management from experts' and managers' perspective in District 5 of Municipality of Tehran?" In order to answer this question, the following objectives are defined:

Determining the role of passive defense in reducing urban damages from experts' and managers' perspective in the district; Determining the role of passive defense in reducing application risk from experts' and managers' perspective; Determining the role of passive defense in developing a proper pattern for urban sustainability (by distributing applications according to the communication networks) from experts' and managers' perspective.

The current study has been carried out in 2018 in Tehran, Iran.

#### *Research literature - Theoretical Foundations of Research*

##### *The process of crisis management*

Smith and Elliott, (2007) defined a cycle of crisis management in which three main phases can be identified

Pre-crisis stage

Stage in the event of a crisis

The stage after the crisis

These stages, in turn, have steps that cannot be distinguished. In many cases, based on type of the crisis, the order of these phases may change (Alamdari and Mashhadi, 2012).

#### *Crisis management and passive defense*

Set of provisions and plans developed both to reduce the consequences of crisis, and to make it possible to reconstruct damaged areas at the lowest cost. Passive defense plans are prepared and implemented before attack and during peacetime. These plans prevent crisis from occurring and create conditions for quick control of the situation to return to the pre-crisis phase. Passive defense in crisis management is a set of provisions, measures and plans that increase defense potential of a group using independent non-organizational tools at the time of crisis, and decrease the consequences of crisis to make it possible to reconstruct damages to the group at the lowest cost, as well (Abhari, 2007).

#### *Five-Ring Theory of Warden (1988)*

After suffering a historic defeat in the Vietnam War (1964-1972), political and military authorities of America carried out continuous studies to investigate their failure in the war and achieve effective air combat strategies. Accordingly, Warden (1998), proposed the Five-Ring theory in his book, "The Air Campaign". According to this theory, the most important task in planning a campaign is to identify wartime targets; when carefully identified and targeted, the invaded country would defeat in the first days of the campaign and surrender in the shortest time (George, and Chappel, 2002; Movahedi Nia, 2007).

The five rings include:

First ring (National Leadership): Includes security centers for making large-scale political decisions such as: Parliament, Presidency, Radio and Television stations, Ministries, Major Command Headquarters, Armed Forces Headquarter, and Telecommunication Organization.

Second ring (Key Productions): Centers such as power plants, refineries, heavy industries, fuel tanks, defense industries, important depots, major food and pharmaceutical depots, and water supply networks.

Third ring (Infrastructures): Facilities included in this ring are airports, railways and subways, ports, dams, bridges, main highways, and urban telecommunication networks.

Fourth ring (Population): Includes metropolises, cities, villages, stadiums and populated centers.

Fifth ring (Fielded military forces): Radar news notification devices, positions and sites of artillery and missile systems, air defense, air bases, ground rocket bases, marine bases, maintenance and spare parts warehouses, operational units of front lines of tactical stations (Movahedi Nia, 2007)

Currently, it seems that the enemy is more focused on military and security threats through investing on security threats in the hostile country and measures such as sabotage, bombing and so on, as well as resorting to soft warfare so as to apply Warden's theory in capturing, sabotaging, and destroying vital and critical urban centers.

#### *Types of defense*

##### *Active defense*

It is the use of weapons against any armed attack (Kamran, 2012). Defined active defense as "defense against enemy using weapons, military equipment, and combat techniques in order to knock up and destroy the enemy war machine (Niazitabar, 2008). It refers to the use of armed forces in a country or direct use of various weapons as well as anti-electronic and anti-ant electronic measures in order to neutralize or reduce the impacts of hostile aerial, marine, intrusive and subversive operations on the desired goals (Akhbari and Ahmadi Moghadam, 2014).

##### *Passive defense*

Literally, the word defense is a combination of two terms in Persian language: "pad" and "afand". In Persian literature, "pad" is a prefix meaning anti, counter, rear, and pursuit. "Afand" means war, fight, battle, and hostility (Dehkhoda, 1998). Human factor has to be considered as a distinction between active and passive defense. It means that active defense is a tool which requires systems management and human users and includes military tools, organizing, training, and managing forces. In the absence of a human factor, this tool is invalid per se. But, passive defense refers to architectural facilities in the field of military engineering which increase martial and defense force without tools and capabilities. To put it in other words, passive defense means unarmed defense against the threat (Movahedi Nia, 2007). The underlying policy of passive defense is based on survival and security, and the overall goal is to deactivate, protect, and reduce

the vulnerability of the infrastructure needed by the people to gradually create conditions for security and safety. Passive defense reduces costs, prevents waste of time and energy, and increases safety factor of a society during peacetime and wartime, in particular (Shakibamanesh, 2009). Passive defense includes all measures taken to maintain security, safety, and network sustainability and its associated facilities. It is a set of measures taken to minimize potential damage in the event of a war (Ahmar luei, 2015). These Measures are taken to reduce the likelihood of occurrence and minimize the effects of hostile actions without initiating action. (Shakib and Moghadasi Musavi, 2006). Passive defense is saving lives, ensuring the safety of people, protecting territorial integrity and national sovereignty, a factor in generating power and enhancing national power at all times against any situation, and any aggression without using weapons. Passive defense, as a branch of crisis management mostly focused on managing pre-crisis situation, refers to any unarmed action that reduces damages to manpower, buildings, facilities, equipment, documents and main pillars of a country against enemy attacks (Kamran, 2012). It should be noted that the type of threat related to passive defense is war, but other human and natural threats are subject to crisis management and require proper preventive measures of its own. Most domestic theorist's also interpreted passive defense with an emphasis on the preventive defense against enemy attacks (wartime) (Ashforth and Lee, 1990; Movahedi Nia, 2007). Centers related with passive defense include: passive defense organization, secretariat of passive defense of the country, passive defense committees in offices, research institute for crisis management and passive defense (private sector), crisis management organization (natural disasters) (Kamran, 2012).

#### *Crisis management*

Crisis refers to dangerous and unreliable situation or period. In other words, crisis is sudden changes that occur in the natural, political, economic, and socioeconomic systems of a region. Crisis Management is an applied science that helps preventing crises, or when crisis occurs, it helps reducing the impacts and providing prompt relief measures to improve the situation. Therefore, the main objective of crisis management is to achieve a

rational solution to overcome abnormal conditions so that basic benefits and values are maintained and safeguarded. Crises that can be prevented and controlled by crisis management include natural and human crises. Passive defense is also one of the branches of crisis management which covers just and only war-based type of crisis (Kamran, 2012). Crisis management is a science and art of planning, organizing, guiding, and leading in an integrated, comprehensive, and coordinated way, and using available tools, it strives to control threats of different kinds of crises depending on the stage they are in (Pearson and clair, 1998; Eskandari, 2011).

#### **MATERIALS AND METHODS**

In order to carry out the study, an applied research method and a combination of documentary, descriptive, analytical and case study methods were used. In terms of the nature of the research, this study was among the descriptive-correlations ones. All managers and experts of District 5 of Municipality of Tehran at all divisions and departments constituted the population of this study. To estimate the sample size, (Krejcie and Morgan, 1970; Chuan, and Penyelidikan, 2006) table was used. According to this table, 274 subjects were selected using regular random sampling method. A researcher-made questionnaire was used as a research tool which was developed based on theoretical basis and background of the research in a 5-point Likert scale. The questionnaire validity and reliability were tested based on the views of the research supervisor, advisor, experts and managers of the municipality, and Cronbach's alpha test, respectively. The obtained  $\alpha$ -values for the role of passive defense in reducing damages to cities, reducing application risk, developing a proper pattern for urban sustainability, and total  $\alpha$  were 0.765, 0.839, 0.759, and 0.787, respectively. Data analysis was performed using SPSS software (v21). Fig. 1 indicates a conceptual model of the research. Since, for developing a model, the components and the relationship between them must be explained first, and then, the logic behind choosing these components and their relationship have to be described.

In the second step, the components of urban crisis management were considered. Three visible components were as follows:

A) Reducing urban damage: many of the existing

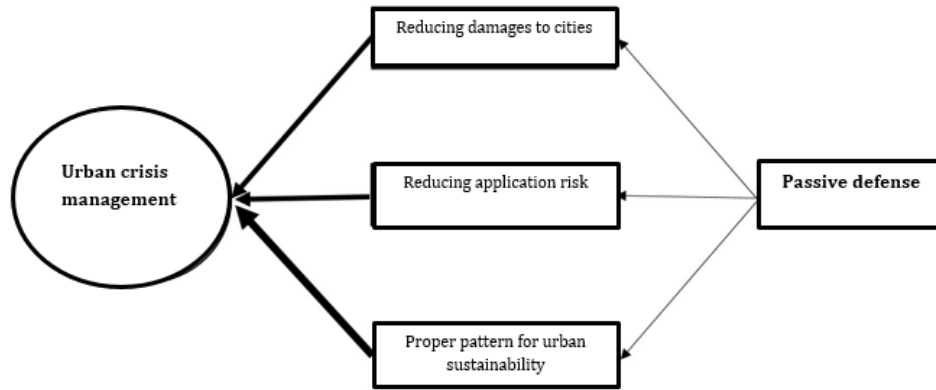


Fig. 1: Conceptual model of the research

Table 1: Analysis of demographic characteristics of the respondents

Variables	Demographic characteristics	Frequency	%
Gender	Male	193	70.44
	Female	81	29.56
Marital status	Single	68	24.82
	Married	206	75.18
Age range	Less than 30	40	14.60
	31-35	57	20.80
	36-40	48	17.52
	41-45	29	10.58
	46-50	37	13.50
	51-55	32	11.68
Education level	More than 56	31	11.31
	Diploma and associate degree	43	15.69
	Bachelor degree	150	54.74
	Master degree	73	26.64
Duration of employment	Ph.D.	8	2.91
	Less than 5 years	32	11.68
	6-10 years	64	23.36
	11-15 years	62	22.63
	16-20 years	73	26.64
Organizational capacity	21-25	27	9.85
	More than 26 years	16	5.84
	Expert	207	75.54
	Supervisor	5	1.82
Total	Manager	62	22.62
	-	274	100

utilities of a city are located in critical infrastructure which will increase its vulnerability. This is due to inappropriate condition of physical indicators and the concentration of administrative, organizational, military, and provincial institutions in this area which should be used as a strategy to reduce urban damage by employing passive defense principles.

B) Reducing utility risk: nowadays, using comprehensive crisis management programs, effective measures along with practical plans, even

at pre-crisis preparation phase, can greatly increase the severity and extent of the damages caused by the risks. One of most important measures is the use of passive defense principles as a strategy to reduce the risk of various hazardous events after their occurrence which needs to be considered at different levels of urban, regional and urban planning and architecture.

C) A model of sustainable city: obviously, development without paying attention to culture, climate and long-term interests of citizens can cause

Table 2: Descriptive data and significance analysis of passive defense impact on reducing damages to cities

	Descriptive data		One-sample T-test	
	Average	SD	T-value	Sig
The role of passive defense in reducing damages to cities	25.14	5.39	6.74	0.000

Table 3: Descriptive data and significance analysis of passive defense impact on reducing application risks

	Descriptive data		One-sample T-test	
	Average	SD	T-value	Sig
The role of passive defense in reducing application risks	18.94	3.32	9.87	0.000

serious damages to the city and citizens. Therefore, with careful consideration, it may be understood that developing a model of a sustainable city requires care and attention to the principles of passive defense and crisis management will have significant results.

## RESULTS AND DISCUSSIONS

### Descriptive statistics

The results of data analysis indicated that, of total respondents (n=274), 29.56% were female and 70.44% were male; 24.82% were single and 75.18% were married. Regarding their age, 14.60% of the respondents were below 30, 20.80% were 31 to 35, 17.54% were 36 to 40, 10.58% were 41 to 45, and 11.31% were above 56 years of age. In terms of education level, 15.69% had diploma and associate degree, 54.74% had Bachelor degree, 26.64% had master degree, and 2.91% had Ph.D. Regarding the duration of employment, 11.68% had served less than 5 years, 23.36% between 6-10 years, 22.63% between 11-15 years, 26.64% between 16-20 years, and 5.84% above 26 years. Among them, 75.54% were working as experts, 1.82% were supervisor, and 22.62% were in a managerial position Table 1, shows the analysis of demographic of the respondents:

### Inferential statistics

#### Testing the hypotheses

Hypothesis 1: passive defense is effective in reducing damages to cities from the perspective of experts and managers of District 5 of Municipality of Tehran.

As shown in Table 2, the average value of passive defense impact on reducing damages to cities is 25.14, its standard deviation is 5.39, T-statistic is 6.74, and the significance level equals 0.000. Thus, the hypothesis is approved. This finding is in line with the results reported by Kamran et al., (2012); Akhbari and Ahmadi Moghadam (2014); and Adeli et al., (2016).

Hypothesis 2: passive defense is effective in reducing application risks from the perspective of experts and managers of District 5 of Municipality of Tehran. As shown in Table 3, the average value of passive defense impact on reducing application risks is 18.94, its standard deviation is 3.32, T-statistic is 9.87, and the significance level equals 0.000. Thus, the second hypothesis is approved, as well. This finding is in line with the results reported by Jadidi (2016) and Rahmani Fazli, et al., (2016).

Hypothesis 3: passive defense is effective in developing a proper pattern for urban sustainability from the perspective of experts and managers of District 5 of Municipality of Tehran. As shown in Table 4, the average value of passive defense impact on developing a proper pattern for urban sustainability is 20.07, its standard deviation is 2.54, T-statistic is 5.79, and the significance level equals 0.000. Thus, this hypothesis is approved. This finding is in line with the results reported by Kamran et al., (2012); Ghorbani and Poor Mohammadi (2003); and Sharifi Rasaei (2015).

Natural and unnatural threats such as earthquakes, flood, air pollution, war, and terrorism, have always

Table 4: Descriptive data and significance analysis of passive defense impact on developing a proper pattern for urban sustainability

	Descriptive data		One-sample T-test	
	Average	SD	T-value	Sig
The role of passive defense in developing a proper pattern for urban sustainability	20.07	2.54	5.79	0.000

plagued the countries. Some threats lead to crises that have devastating effects on safety of a country. So countries need crisis management. Passive defense measures, which reduce damages to cities and increase sustainability and continuity of the country's systems in crisis, are introduced as a tool in crisis management to deal with crises (caused by the threats). The experiences of human history in the crisis are evidence of the vital importance of passive defense. Implementation of passive defense measures leads to survival of manpower as the main element of crisis management. Not all principles of passive defense (deception, cover, and so on) may be applicable in facing the crises caused by natural threats; however, passive defense measures (correct and early locating, reinforcing, and creating fortifications), added to saving macroeconomic, political, military and communicative resources, can make it possible to stick with the plan during the crisis. As passive defense measures proved their significance and effectiveness in dealing with (natural and unnatural) threats in crisis management, employing passive defense measures and provisions results in not only sharp reduction in costs, but also great increase in defensive efficiency of plans, goals, and projects during the crisis. Passive defense plans are developed before crisis, at the time of peace, and include design for all steps of crisis management. Basic definitions of passive defense may unwittingly focus one's attention on political and military defense issues, rather than events and crises caused by natural forces; however, the truth is that, in addition to reducing damage caused by human-made threats, passive defense measures in residential areas are also useful in reducing risks in face of natural hazards. In fact, underlying administrative and structural measures of passive defense facilitate crisis management.

## CONCLUSION

Managers' insights regarding passive defense and crisis management are considered as the greatest gap. In order to modify and improve this insight, necessary measures have to be taken. The most important issue in crisis management is the crisis management process, which is often overlooked, neglected and often the focus is on other aspects of it, while the main framework needs to be taken more seriously. It is absolutely imperative that all

strategic managers as well as middle managers of the country, be aware of crisis management both in the field of natural disasters and in the field of war and industrial disasters. In this field, the culture will be developed. Therefore, urban managers should play a very important role in comprehensive crisis management with realistic views on management systems. Therefore, it is suggested that the principles of passive defense in urban plans and programs would be considered. The principles of passive defense apply to the construction of all of the city's strategic centers. The network of infrastructures and camping facilities should be considered in locating public buildings.

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## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this manuscript. In addition, the ethical issues; including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy have been completely observed by the authors.

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